

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SMAXTEC INC. and SMAXTEC ANIMAL CARE GMBH,
Petitioner,

v.

ST REPRODUCTIVE TECHNOLOGIES, LLC,
Patent Owner.

IPR2024-01067
Patent 10,231,644 B2

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

BALTATZIS, *Administrative Patent Judge*.

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

I. INTRODUCTION

smaXtec Inc. and smaXtec Animal Care GmbH (collectively, “Petitioner”) filed a Petition requesting an *inter partes* review of claims 5–7, 9, 10, and 13 (the “challenged claims”) of U.S. Patent No. 10,231,644 B2 (Ex. 1001, “the ’644 patent”). Paper 1 (“Pet.”). ST Reproductive Technologies, LLC (“Patent Owner”) filed a Preliminary Response (Paper 6, “Prelim. Resp.”) and a statutory disclaimer of claim 13 (Ex. 2004).

Under 35 U.S.C. § 314(a), the Board may not authorize an *inter partes* review to be instituted unless the information presented in the petition and any response shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition. After considering the Petition, the Preliminary Response, and the evidence of record, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing with respect to at least one claim challenged in the Petition. Accordingly, we institute an *inter partes* review of claims 5–7, 9, and 10 of the ’644 patent, based on all of the grounds identified in the Petition. We do not institute review of disclaimed claim 13. *Infra* Section III.A; 37 C.F.R. § 42.107(e) (2023).

The following findings of fact and conclusions of law are not final, but are made for the sole purpose of determining whether Petitioner meets the threshold for initiating review. Any final decision will be based on the full trial record, including any response timely filed by Patent Owner. Any arguments not raised by Patent Owner in a timely-filed Response may be deemed forfeited, even if they were presented in the Preliminary Response.

II. BACKGROUND

A. Real Parties in Interest

Petitioner identifies smaXtec Inc. and smaXtec Animal Care GmbH as the real parties-in-interest. *See* Pet. x. Patent Owner identifies ST Reproductive Technologies, LLC and Inguran, LLC as the real parties-in-interest. Paper 3, 1.

B. Related Matters

The parties identify the following district court litigation involving the '644 patent: *ST Reproductive Technologies, LLC d/b/a STInsight v. Smaxtec Inc. and smaXtec Animal Care GmbH*, Case No. 24-cv-00037 (W.D. Wis.), filed on January 18, 2024. Pet. x; Paper 3, 1.

Petitioner further identifies the following *inter partes* review proceedings that “may affect indirectly or may be affected indirectly by the decision in this proceeding due to the involvement of all three patents in the Wisconsin Litigation”: IPR2024-00885 (challenging claims of U.S. Patent No. 8,823,515) and IPR2024-00875 (challenging claims of U.S. Patent No. 9,844,206). Pet. x–xi.

C. The '644 Patent (Ex. 1001)

The '644 patent relates to “[a]n animal monitoring device configured as a bolus.” Ex. 1001, 1:5. The bolus is orally administered “to reside in the reticulorumen of a ruminant animal.” *Id.* at 1:6–7. Reticulorumen “means the first chamber in the alimentary canal of a ruminant animal . . . composed of the rumen and reticulum.” *Id.* at 3:36–38.¹ Ruminant animals include “mammal[s] of the suborder Ruminantia,” e.g., cattle, goats, and sheep. *Id.*

¹ *See also* Ex. 1005, Figure 1 illustrating the location of an ingestible bolus in a ruminant animal’s reticulum or rumen.

at 3:17–21. Once located in the animal’s reticulorumen, the bolus can monitor one or more physiological parameters over the animal’s lifespan. *See id.* at 1:41–45.

Figure 2 illustrates a block diagram of a bolus and is reproduced below.

FIG. 2

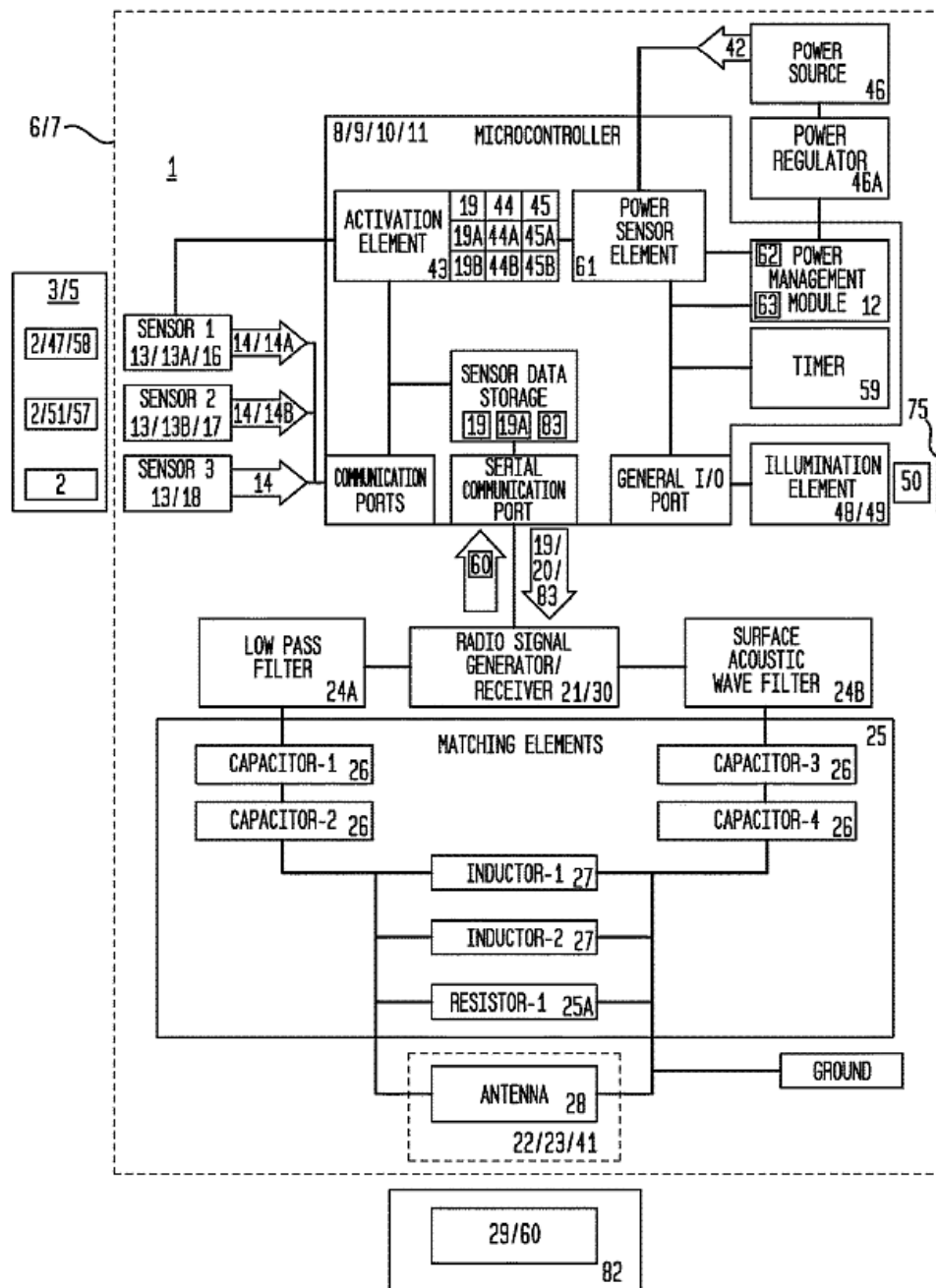


Figure 2 illustrates a block diagram of bolus 1. *Id.* at 2:27–29. Bolus 1 may include sensor(s) 13 capable of generating sensor signal 14. *Id.* at 3:58–60. Sensor signal 14 varies based on a corresponding change of one or more physiological parameters 2 of ruminant animal 3. *Id.* at 3:60–62.

Bolus 1 further includes microcontroller 8 with processor 9 communicating with memory element 10 containing computer code 11. *Id.* at 4:24–26. Computer code 11 “can be executed to continuously or intermittently transform the analog or digital sensor signal (14) from the one or more sensors (13) as encoded physiological data (19) (also referred to as ‘encoded sensor signals’).” *Id.* at 4:26–30. Encoded physiological data 19 (encoded sensor signals) is used to make determinations relating to ruminant animal 3. *See id.* at 10:9–11.

Bolus 1 transmits encoded physiological data 19 to radio signal reader(s) 79, by generating radio signal 22 using antenna 28. *Id.* at 6:39–45; 14:9–13. Antenna 28 may include first electrically conductive loop 32 electrically interconnected to second electrically conductive loop 33 electrically connected to radio signal generator 21 or radio signal receiver 30. *Id.* at 6:62–7:2; *see also id.* at Fig. 6. First and second electrically conductive loops can further include circuit board 31/non-electrically conductive substrate 38 disposed between the pair of electrically conductive loops. *Id.* at 7:2–16; *see also id.* at Fig. 6. According to the Specification, the antenna structure “alters the magnetic field and electrical field generation in a manner that reduces the impact of uncontrollable changes in the orientation of the bolus and correspondingly the orientation of the antenna during residence of the bolus in the reticulorumen of the ruminant animal.” *Id.* at 2:10–16.

Bolus 1 also includes power management module 12 that regulates used energy 42 by enabling or disabling one or more sensors 13 based upon a predetermined set of physiological parameters 2. *Id.* at 10:4–9. Power management module 12 can further include timer element 59 that regulates energy used by the bolus based on elapsed time. *Id.* at 10:55–61. For example:

power management module (12) can function to reduce the period of time between reads of the sensor signal (14) temperature (57) and the sensor signal (14) for movement (58), such as, four times in a twenty-four hour period. Similarly, there may be a lesser period of time between operational periods of the radio signal generator (21), such as every six hours, and the operational period of the radio signal generator (21) may be adjusted to a period of time to transmit the additional encoded physiological data (19).

Id. at 11:12–20.

D. Illustrative Claims

Petitioner challenges claims 5–7, 9, 10, and 13 of the '644 patent. Pet. 1–2. Claims 5 and 9, the challenged independent claims of the '644 patent, are illustrative of the challenged claims, and are reproduced below²:

5. [Pre] A method of monitoring physiological parameters of a ruminant animal, comprising:

[A] generating a sensor signal from one or more sensors contained in a bolus orally administered to said ruminant animal,

[B] said sensor signal varies based on a corresponding change in one or more physiological parameters of said ruminant animal;

² We adopt Petitioner's bracketed identifiers.

- [C] encoding said sensor signal from said one or more sensors as encoded physiological data corresponding to said one or more physiological parameters of said ruminant animal; and
- [D] storing said encoded physiological data in a non-transitory computer readable media,
- [E] enabling a radio signal generator located within said bolus;
- [F] activating said radio signal generator at pre-determined intervals to generate a radio signal to carry said encoded physiological data; and
- [G] generating said radio signal having a frequency of between about 700 MHz to about 1 GHz.

Ex. 1001, 21:28–47.

9. [Pre] A method of monitoring physiological parameters of a ruminant animal, comprising:

- [A] generating a sensor signal from one or more sensors contained in a bolus orally administered to said ruminant animal,
- [B] said sensor signal varies based on a corresponding change in one or more physiological parameters of said ruminant animal;
- [C] encoding said sensor signal from said one or more sensors as encoded physiological data corresponding to said one or more physiological parameters of said ruminant animal;
- [D] storing said encoded physiological data in a non-transitory computer readable media;
- [E] enabling a radio signal generator located within said bolus;
- [F] activating said radio signal generator to generate a radio signal to carry said encoded physiological data; and

[G] transmitting said radio signal with an antenna having a pair of electrically conductive loops disposed a distance apart and further comprising transmitting said radio signal through said antenna.

Id. at 22:14–34.

E. Asserted References

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

Name	Reference	Ex. No.
Riskey	US 2009/0187392 A1	1005
Rettedal	US 2013/0197323 A1	1006
Harvey	WO 2008/108816 A1	1004
Kunda	JP 2004-215061 A	1007 ³

F. Asserted Grounds of Unpatentability

Petitioner asserts that claims 5–7, 9, 10, and 13 of the '644 patent are unpatentable in view of the following grounds. Pet. 1–2.

Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1	5, 6	102	Harvey
2	5, 6	102	Riskey
3	5, 6	103	Harvey, Risky
4	7	103	Harvey, Rettedal
5	9, 10	103	Harvey, Kunda
6	13	102	Riskey
7	13	103	Riskey

Petitioner relies on the Declaration of Darrin J. Young, Ph.D. (Ex. 1002) in support of its contentions. Patent Owner relies on the

³ Kunda is a Japanese-language document. Petitioner relies on an English translation of Kunda. *See* Ex. 1007, 20–60.

Declaration of Edwin C. Kan, Ph.D. (Ex. 2001) in support of its Preliminary Response.

III. ANALYSIS

A. Disclaimed Claim 13

Petitioner challenges claim 13 as anticipated by or obvious over Risky. Pet. 66–75.

Patent Owner disclaimed claim 13 of the '644 patent. Prelim. Resp. 66 (citing Ex. 2004). Our rules explain: “The patent owner may file a statutory disclaimer,” and “[n]o inter partes review will be instituted based on disclaimed claims.” 37 C.F.R. § 42.107(e). Patent Owner filed a statutory disclaimer on October 24, 2024. Ex. 2004. A disclaimer under 35 U.S.C. § 253(a) is “considered as part of the original patent” as of the date on which it is “recorded” in the Office. 35 U.S.C. § 253(a). For a disclaimer to be “recorded” in the Office, the disclaimer must:

- (1) Be signed by the patentee, or an attorney or agent of record;
- (2) Identify the patent and complete claim or claims, or term being disclaimed. . . .;
- 3) State the present extent of patentee’s ownership interest in the patent; and
- (4) Be accompanied by the fee set forth in [37 C.F.R.] § 1.20(d).

37 C.F.R. § 1.321(a); *see also Vectra Fitness, Inc. v. TNWK Corp.*, 162 F.3d 1379, 1382 (Fed. Cir. 1998) (holding § 253 disclaimer is immediately “recorded” on date the USPTO receives a disclaimer meeting the requirements of § 1.321(a), and no further action is required in the USPTO). Patent Owner’s filing of Exhibit 2004 appears to meet these requirements.

Because claim 13 is disclaimed, no *inter partes* review is instituted as to claim 13.

B. Legal Standards

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden does not shift to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burden of proof in *inter partes* review). Furthermore, Petitioner must explain with particularity how the prior art would have rendered the challenged claims unpatentable. 35 U.S.C. § 312(a)(3); 37 C.F.R. § 42.104 (“The petition must specify where each element of the claim is found in the prior art patents or printed publications relied upon.”).

A patent claim is unpatentable under 35 U.S.C. § 102 if “the four corners of a single, prior art document describe every element of the claimed invention, either expressly or inherently, such that a person of ordinary skill in the art could practice the invention without undue experimentation.” *Advanced Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1282 (Fed. Cir. 2000). “A single prior art reference may anticipate without disclosing a feature of the claimed invention if such feature is necessarily present, or inherent, in that reference.” *Allergan, Inc. v. Apotex Inc.*, 754 F.3d 952, 958 (Fed. Cir. 2014). Moreover, the reference must also “disclose[] within the four corners of the document not only all of the limitations claimed but also

all of the limitations arranged or combined in the same way as recited in the claim.” *Net MoneyIN, Inc. v. Verisign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008).

A claim is unpatentable under 35 U.S.C. § 103 if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious to a person having ordinary skill in the art to which said subject matter pertains. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations.⁴ *See Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 17–18 (1966).

C. Person of Ordinary Skill in the Art

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

Petitioner asserts that a person of ordinary skill in the art (“POSA”) as of the claimed priority date would have “had *at least* a bachelor’s degree in electrical engineering or a related or equivalent field, and three *or more* years of experience researching, developing, designing and/or evaluating

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

sensor systems for humans or other animals.” Pet. 5 (citing Ex. 1002 ¶ 35) (emphasis added). Patent Owner does not contest Petitioner’s characterization at this time. *See* Prelim. Resp. 29 (citing Ex. 2001 ¶¶ 19–20).

On this record and for the purposes of institution, we determine this level of skill, with the exception of the open-ended phrases “at least” and “or more,” which we remove from Petitioner’s proposal, comports with the qualifications a person would have needed to understand and implement the teachings of the ’644 patent and the prior art of record.

D. Claim Construction

We construe claim terms according to the standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–17 (Fed. Cir. 2005) (en banc), i.e., as construed in a civil action under 35 U.S.C. § 282(b). *See* 37 C.F.R. § 42.100(b). Under *Phillips*, claim terms are afforded “their ordinary and customary meaning.” *Id.* at 1312. “[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Id.* at 1313. “Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Id.*

Neither party seeks a specific claim construction or definition for any claim term. *See* Pet. 10; Prelim. Resp. 29. For purposes of this Decision, we determine that no claim terms require express construction. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795,

803 (Fed. Cir. 1999) (“[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.”)).

E. Asserted Anticipation of Claims 5 and 6 by Risky

Petitioner contends that claims 5 and 6 are anticipated by Risky. Pet. 27–38. Patent Owner disputes Petitioner’s contentions. Prelim. Resp. 49–52.

1. Risky (Ex. 1005)

Risky relates to a bolus for monitoring a health condition of an animal. Ex. 1005 ¶ 16. The bolus may be ingested and remain within the reticulum or rumen of a ruminant animal. *Id.* ¶ 17; Fig. 1.

Figure 2 illustrates the bolus and is reproduced below.

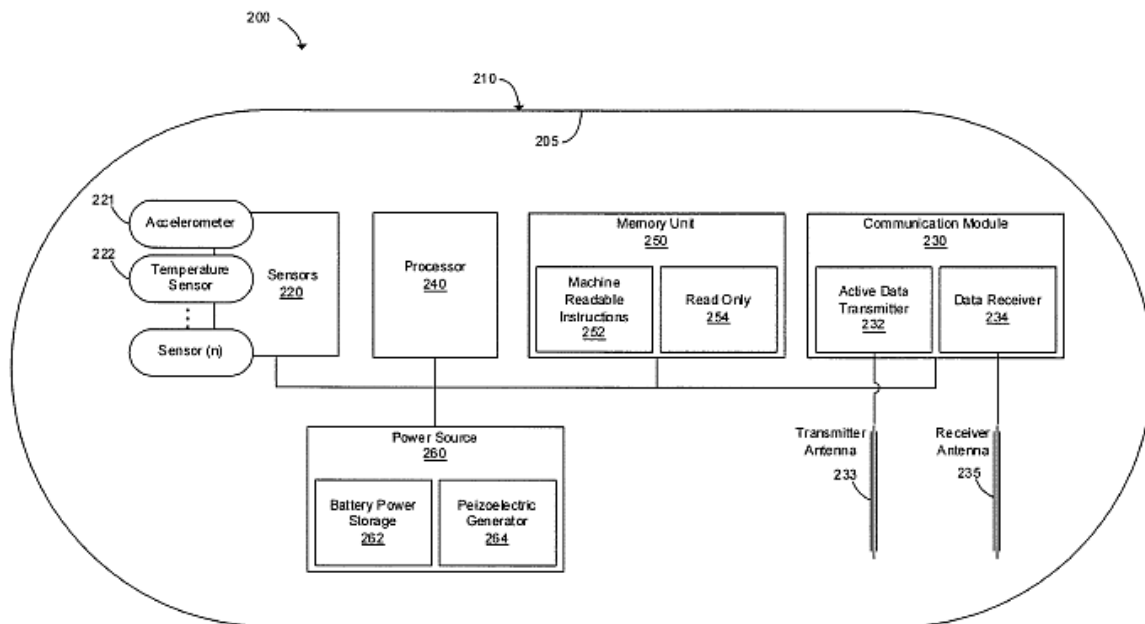


Figure 2 illustrates a block diagram of a bolus comprising one or more sensors. *Id.* ¶ 4.

Bolus 210 includes sensors 220 that “may be used to detect physiological characteristics of an animal including, but not limited to: body temperature; heart rate; respiration; stomach contractions; stomach pH; blood pH; and the like.” *Id.* ¶ 35. Bolus 210 may further include

communication module 230, processor 240, memory unit 250, and power source 260. *Id.* ¶¶ 37–44. Communications module 230 may include data transmitter 232 coupled to transmitter antenna 234. *Id.* ¶ 37. Processor 240 is communicatively coupled to memory unit 250 that “may comprise machine readable instructions 252 stored thereon,” read and executed by processor 240. *Id.* ¶ 38. “Machine readable instructions 252 stored on memory unit 250 may specify a sensor sampling frequency for each of the sensors 220.” *Id.* ¶ 39.

Riskey discloses different modes of operations whereby “processor 240 may transmit sensor measurements obtained by polling sensors 220 via data transmitter 232.” *Id.* ¶ 49. In one mode of operation

processor 240 may not immediately transmit the sensor readings polled from sensors 220, but instead store them on memory unit 250. In this mode, machine readable instructions 252 may specify a transmission interval, wherein processor 240 may transmit an animal characteristics message comprising some or all of the measurements stored in memory unit 250 at each transmission interval. This operational mode may be referred to as “burst” mode since sensor 220 readings are transmitted as periodic bursts rather than when sensor polling takes place. Operation in “burst” mode may reduce the power consumed by bolus 210 by reducing the number of transmissions sent from data transmitter 232.

Id.

2. *Independent Claim 5*

a) *Preamble and Limitations 5[A]–5[D]*

Petitioner asserts Risky discloses a method of monitoring physiological parameters of a ruminant animal (*see* claim 5 preamble)⁵ by generating a sensor signal from sensors contained in an orally administered bolus (*see* limitation 5[A]), the sensor signal varying based on a corresponding change of the ruminant animal’s physiological parameters (*see* limitation 5[B]). Pet. 27–31 (citing Ex. 1005, Abstr., ¶¶ 16–17, 25, 29, 35, 39, 43, 44, 101, Figs. 1, 2; Ex. 1002 ¶¶ 77–84).

Petitioner further asserts Risky discloses encoding the sensor signal as data (*see* limitation 5[C]) and storing the encoded data (*see* limitation 5[D]). Pet. 32–35 (citing Ex. 1005 ¶¶ 21, 23, 37, 41, 43–44, 49–51, 58, Fig. 2; Ex. 1002 ¶¶ 86–90).

At this time, Patent Owner does not dispute that Risky discloses the preamble and limitations 5[A]–5[D]. *See* Prelim. Resp. 49–52.

On this record and for the purposes of institution, we are sufficiently persuaded by Petitioner’s argument and evidence that Risky discloses the preamble and limitations 5[A]–5[D].

b) *Limitations 5[E]–5[G]*

Petitioner asserts Risky discloses the steps of “enabling a radio signal generator located within said bolus” (limitation 5[E]), “activating said radio signal generator at predetermined intervals to generate a radio signal to carry said encoded physiological data” (limitation 5[F]), and “generating said

⁵ Because Petitioner has sufficiently shown that the prior art teaches the preamble, we need not determine at this time whether the preamble is limiting. *See Nidec*, 868 F.3d at 1017.

radio signal having a frequency of between about 700 MHz to about 1 GHz” (limitation 5[G]). Pet. 35–37 (citing Ex. 1005, Fig. 2, Abstr., ¶¶ 19, 21, 37, 49–50, 55–56, 59; Ex. 1002 ¶¶ 91–94). Specifically as to limitation 5[F], Petitioner asserts Risky discloses two examples of generating radio signals carrying physiological data at pre-determined intervals. *Id.* at 36–37 (Ex. 1002 ¶¶ 92–93). First, Petitioner cites Risky’s “burst” mode in which “the transmitter is activated at predetermined, periodic intervals” as opposed to when sensor polling takes place. *Id.* (citing Ex. 1005 ¶ 49). Second, Petitioner cites Risky’s “‘on-line’ mode in which the transmitter is activated at a predetermined ‘transmission frequency’—*i.e.*, transmission interval—specified by the device’s machine readable instructions.” *Id.* at 37 (citing Ex. 1005 ¶¶ 55, 59; Ex. 1002 ¶¶ 92–93).

At this time, Patent Owner does not dispute that Risky discloses limitations 5[E] and 5[G] of claim 5. *See* Prelim. Resp. 49–53. On this record and for the purposes of institution, we are sufficiently persuaded by Petitioner’s argument and evidence that Risky discloses limitations 5[E] and 5[G], and we address Patent Owner’s argument as to limitation 5[F].

Patent Owner argues that Petitioner fails “to establish that Risky discloses ‘activating said radio signal generator at pre-determined intervals to generate a radio signal to carry said encoded physiological data,’ as required by element 5[F].” *Id.* at 49. As to the “burst mode” example, Patent Owner argues that “[a] POSA reading Risky would understand that the ‘transmission interval’ in Risky is not pre-determined, but dependent on triggering events that affect the delay applied between transmissions.” *Id.* at 50 (citing Ex. 2001 ¶ 89). Specifically, Patent Owner cites Risky’s machine-readable instructions 252 that vary transmission frequency based on “varying conditions related to the animal.” *Id.* at 50–51 (citing Ex. 1005

¶¶ 48, 142; Ex. 2001 ¶ 89). As to the “on-line mode” example, Patent Owner argues that Risky does not disclose a signal with physiological data, but instead a “discovery message” or “ping” to a base station or transceiver. *Id.* at 51–52 (citing Ex. 1005 ¶¶ 37, 53; Ex. 2001 ¶ 91).

We determine that, on this record, Petitioner establishes sufficiently for the purposes of institution that Risky discloses “activating said radio signal generator at predetermined intervals to generate a radio signal to carry said encoded physiological data.” Pet. 36–37 (citing Ex. 1005 ¶¶ 49, 55, 59; Ex. 1002 ¶¶ 92–93). Specifically, Risky discloses a “burst mode” in which “machine readable instructions 252 may specify a transmission inter[v]al, wherein processor 240 may transmit an animal characteristics message comprising some or all of the measurements stored in memory unit 250 at each transmission interval.” Ex. 1005 ¶ 49. Likewise, Risky discloses an “‘on-line’ mode” in which “bolus 210 may transmit animal characteristics messages at the ‘online’ transmission frequency specified by machine readable instructions 252.” *Id.* ¶ 55. “[S]uch messages . . . may be transmitted at a periodic transmission interval.” *Id.* Accordingly, Risky’s transmission intervals in “burst mode” and “on-line mode” are predetermined by the machine readable instructions. *See id.*

Patent Owner’s contrary arguments rely on different embodiments in Risky. *See* Prelim Resp. 49–52. For example, Patent Owner cites an alternative to “burst mode” wherein machine readable instructions may vary the polling frequency. *See id.* at 49–51 (citing Ex. 1005 ¶ 48). And Patent Owner cites an “‘on-line’ mode” for pinging to detect whether the bolus is in range of a base station. *See id.* at 52 (citing Ex. 1005 ¶ 53). Apart from these embodiments, Risky however expressly discloses a “burst mode” (Ex. 1005 ¶ 49) and an “on-line” mode (Ex. 1005 ¶ 55), each of which transmits

“animal characteristic messages” at set transmission intervals specified by machine readable instructions. Ex. 1005 ¶¶ 49, 55. In sum, Patent Owner’s arguments relate to different disclosures and are therefore inapposite to our determination that Petitioner has sufficiently shown that the Petitioner-cited portions of the reference disclose the predetermined activation (limitation 5[F]).

c) Conclusion as to Claim 5

Based on the current record, there is a reasonable likelihood that Petitioner will prevail in demonstrating that claim 5 is unpatentable as anticipated by Risky.

3. Claim 6

Petitioner presents evidence that Risky discloses the limitations of claim 6. Pet. 37–38 (citing Ex. 1005 ¶¶ 21, 23, 37; Ex. 1002 ¶ 95). Patent Owner does not separately argue claim 6 at this stage of the proceeding. Patent Owner may raise any arguments regarding claim 6 in its Patent Owner Response after institution. On the present record, Petitioner shows sufficiently that Risky discloses the limitation of claim 6.

F. Asserted Anticipation of Claims 5 and 6 by Harvey

Petitioner contends that claims 5 and 6 are anticipated by Harvey. Pet. 16–27. Patent Owner disputes Petitioner’s contentions. Prelim. Resp. 34–49.

1. Harvey (Ex. 1004)

Harvey relates to a livestock management system. Ex. 1004, 1:16–18. Harvey’s livestock management system includes “an active [Radio Frequency (RF)] tag and corresponding interrogator, configured to infer a monitored subject state from a sensed physical quantity of a monitored subject, relative to a monitored subject group.” *Id.* The monitored subject

group may include a cattle herd with individual monitored subjects. *Id.* at 7:25–28.

The monitored subjects “may bear a respective incorporated telemetry device, as represented by respective intelligent active tags (IAT) 1110–1113 (generally IAT 1110).” *Id.* at 8:5–7; *see also id.* at Fig. 1. “Incorporated telemetry device 1110–1113 (generally, intelligent active tag, or IAT 1110) can be a telemetry device coupled to a respective monitored subject 1010, which may be disposed internally or externally to a monitored subject” *Id.* at 11:4–6. In “non-limiting implementations, IAT 1110 may be restrained or moveable within monitored subject 1010, for example, as a digestive tract bolus device, or as a miniature transponder In ruminant monitored subjects such as cattle, a digestive tract bolus tag may be retained indefinitely within the animal.” *Id.* at 11:10–14.

Harvey further describes intelligent transponder (XPDR) 5000 “which may be used as a constituent element of multi-modal intelligent active tag 2000. . . . A suitable active tag may be an intelligent active tag, such as IAT 1110 in FIG.1 and tag 2000 in FIGS. 2 and 3.” *Id.* at 22:29–34. XPDR 5000 is illustrated in Figure 5, reproduced below.

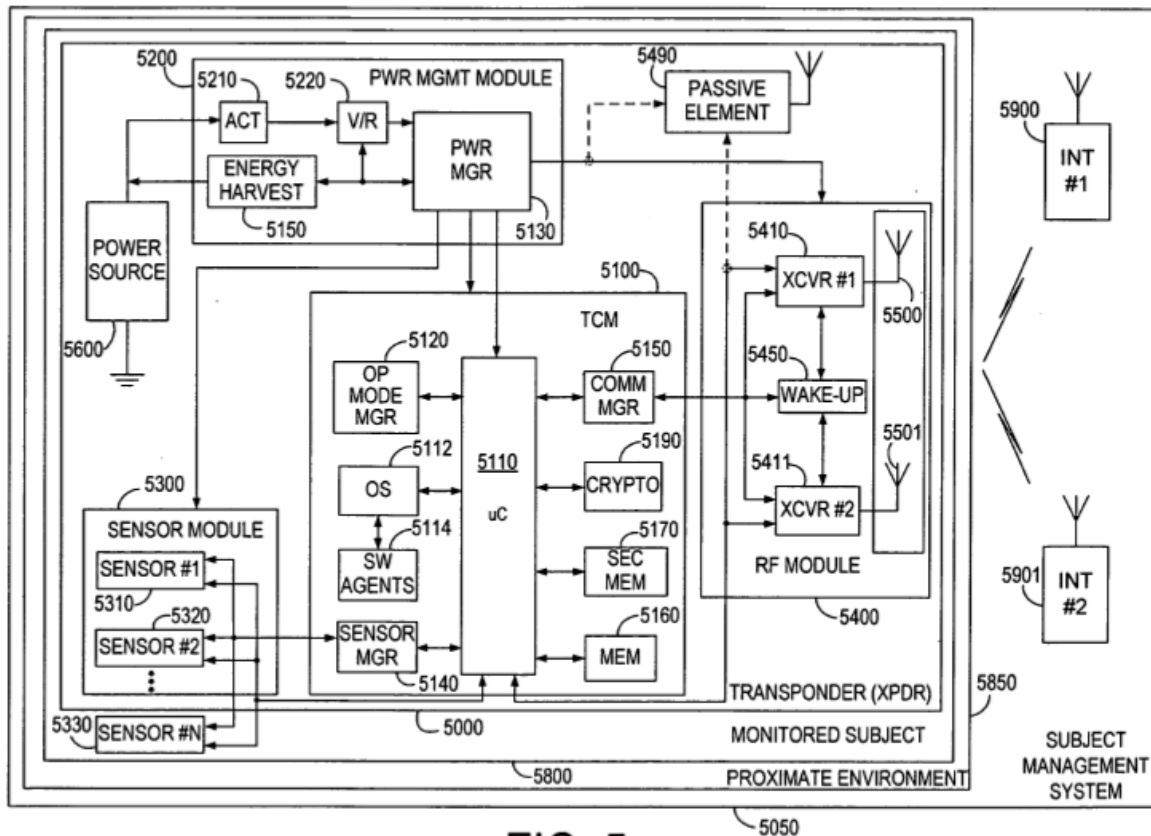


FIG. 5

Figure 5 illustrates a logical block diagram of XPDR 5000. *Id.* at 6:25–26.

“XPDR 5000 can include transponder controller module (TCM) 5100, power management module (PMM) 5200, sensor module (SDM) 5300, and RF module (RFM) 5400.” *Id.* at 29:17–18. “TCM 5100 may include microcontroller (uC) 5110 and memory (MEM) 5160.” *Id.* at 29:21–22. XPDR 5000 further includes sensor module 5300 that transforms a “sensed physical quantity representation to a sensed data signal, which may be communicated to [interrogator (INT)] 5900.” *Id.* at 37:35–38:1. Sensor module 5300 may include one or more sensors 5310, 5320, and 5330. *Id.* at 38:1–2. “A sensor can be a transducer configured to sense a measurable physical property of a physical system, and to produce a measurand representative of an attribute of the measurable physical property.” *Id.* at 38:2–4.

2. *Independent Claim 5*

Because we have found that Petitioner has sufficiently shown, for the purposes of institution, a reasonable likelihood that it would prevail in showing that claims 5 and 6 are unpatentable as anticipated by Risky, as discussed above (section II.E.), we will institute, and our institution is necessarily on all claims and all grounds. *See SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018); 37 C.F.R. § 42.108(a) (“When instituting . . . review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.”). We do not reach a determination regarding the likelihood of success for Petitioner in showing anticipation of claims 5 and 6 by Harvey. However, as Harvey is used in other asserted grounds and (with respect to this ground) for the benefit of the parties in the proceeding going forward, we provide these initial views on Harvey, for the purposes of institution and on the current record.

a) *Preamble*

Petitioner asserts that Harvey discloses “[a] method of monitoring physiological parameters of a ruminant animal.” *See* Pet. 16. Specifically, Petitioner asserts “Harvey teaches a method of monitoring physiological parameters—*e.g.*, body temperature, heart rate, respiration, humidity, hydration state, and EEG, ECG or EMG waves—of one or more ruminant animals, *e.g.*, cattle.” *Id.* (citing Ex. 1004, 1:16–19, 11:10–14; Ex. 1002 ¶ 55).

Patent Owner does not dispute that Harvey teaches the preamble of claim 1. On this record and for the purposes of institution, we are

sufficiently persuaded by Petitioner’s argument and evidence that Harvey teaches the preamble of claim 1.⁶

b) Limitations 5[A] and 5[B]

Petitioner asserts Harvey discloses the step of “generating a sensor signal from one or more sensors contained in a bolus orally administered to said ruminant animal” (limitation 5[A]), “said sensor signal varies based on a corresponding change in one or more physiological parameters of said ruminant animal” (limitation 5[B]). Pet. 17–20 (citing Ex. 1004, 11:10–14, 11:20–24, 38:2–6, 25–31, Fig. 5).

As to limitation 5[A], Petitioner asserts Harvey teaches “IAT . . . may be . . . a digestive tract bolus device In ruminant monitored subjects such as cattle, a digestive tract bolus tag may be retained indefinitely within the animal.” *Id.* at 17 (quoting Ex. 1004, 11:10–14) (alterations in original). Petitioner asserts “Harvey’s bolus includes a transponder containing multiple sensors, as illustrated in Fig. 5.” *Id.* at 18. According to Petitioner, “[e]xamples of signal-producing sensors in Harvey’s bolus include a body temperature sensor, a heart-rate sensor, an accelerometer, a humidity sensor, and/or electrical sensors” *Id.* (citing Ex. 1004, 38:25–31, 40:25–37, 39:15–36, 40:17–20, 41:1–6). Petitioner further asserts that each of the signal-producing sensors senses a measurable physical property to produce a measured representative of a dynamic attribute, i.e., a changing physical parameter. *Id.* at 19–20 (citing Ex. 1004, 11:20–24, 38:2–6; Ex. 1002 ¶¶ 59, 60).

⁶ Because Petitioner has sufficiently shown that the prior art teaches the preamble, we need not determine at this time whether the preamble is limiting. *See Nidec*, 868 F.3d at 1017.

Patent Owner argues “Harvey cannot anticipate claims 5–6 because it fails to disclose a bolus containing the relevant sensors and radio signal generator as arranged in the claims.” Prelim. Resp. 40 (citing *Net MoneyIN*, 545 F.3d at 1369–71). Specifically, Patent Owner argues that Petitioner combines Harvey’s “single, conclusory mention” of a digestive tract bolus with the more fulsome disclosure of intelligent transponder (XPDR) 5000 “which is described only as an external device, such as an animal ear tag.” *Id.* at 35 (citing Ex. 1004, 11:4–14, 22:29–30, Fig. 1). Patent Owner supports its argument by citing Harvey’s various depictions of external ear tags and the detailed benefits thereof. *See id.* at 36–40 (citing Ex. 1004, Figs. 1, 2A–2C, 3A, 3B).⁷ Patent Owner further argues Petitioner relies on an embodiment that “is never described or depicted as a bolus . . . because a POSA would not understand the XPDR 5000 as being capable of use in a bolus.” *Id.* at 39 (citing Ex. 2001 ¶¶ 73–74).

On this preliminary record, we are not persuaded that Petitioner establishes Harvey anticipates claim 5 by clearly and unequivocally disclosing the claimed bolus without need for combining various disclosures not directly related to each other by the teachings of the cited reference. *See Net MoneyIN*, 545 F.3d at 1371 (citing *In re Arkley*, 455 F.2d 586, 587 (CCPA, 1972)). More specifically, we are not persuaded that Petitioner shows Harvey’s IAT, which may be a digestive tract bolus device, is directly

⁷ Patent Owner argues that “Harvey teaches away from a bolus configuration for the XPDR 5000 by expressing the benefits of affixing the tag *externally*.” Prelim. Resp. 36. We do not find this argument persuasive because “the question whether a reference ‘teaches away’ from the invention is inapplicable to an anticipation analysis.” *Celeritas Techs. Ltd. v. Rockwell Int’l Corp.*, 150 F.3d 1354, 1361 (Fed. Cir. 1998).

related to Harvey's XPDR 5000, so that the sensors and associated disclosure of XPDR 5000 apply to the digestive tract bolus. Instead, Petitioner simply states "Harvey's bolus includes a transponder containing multiple sensors, as illustrated in Fig. 5," without any citation to the reference or Petitioner's declarant's testimony connecting these disclosures. *See* Pet. 17–19. Because we institute on the Risky-anticipation ground, however, we encourage the parties to further address this issue at trial.

c) Limitations 5[C] and 5[D]

Petitioner asserts Harvey discloses the steps of "encoding said sensor signal from said one or more sensors as encoded physiological data corresponding to said one or more physiological parameters of said ruminant animal" (limitation 5[C]) and "storing said encoded physiological data in a non-transitory computer readable media" (limitation 5[D]). Pet. 20–23 (citing Ex. 1004, 29:16–28, 30:6–9, 39:4–5, 10:3–11:3, 24:20–23, 42:36–43:20, Fig. 5; Ex. 1002 ¶¶ 62–66). Specifically, as to limitation 5[C], Petitioner asserts that Harvey's sensors produce signals in analog form that are sent into the transponder's microcontroller and then stored in the transponder's memory. *Id.* at 20–22 (citing Ex. 1004, 29:16–28, 39:4–5, Fig. 5). Petitioner asserts that only digital information can be transmitted and stored in memory by a digital protocol, so that "Harvey necessarily requires the analog signals to be encoded into digital form as physiological data corresponding to the measured physiological parameters." *Id.* at 21. Dr. Young testifies that Harvey's encoding "would occur in an analog-to-digital converter ('ADC')" that would be "necessarily present to produce the digital signals." Ex. 1002 ¶ 63 (citing Ex. 1014, 9:17–20; Ex. 1015, 1:49–60; Ex. 1020, 3).

Patent Owner argues Petitioner does “not adequately explain how [the encoding] element is necessarily present in the transponder described in Harvey.” Prelim. Resp. 41. Patent Owner argues that for Petitioner “to demonstrate that Harvey meets this element, [it] must establish that Harvey inherently discloses encoding sensor signals into . . . encoded physiological data.” *Id.* (citing *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999)). But, according to Patent Owner, Harvey does not illustrate an analog-to-digital converter, or mention the terms “‘analog’ signals, ‘digital’ signals, ‘analog-to-digital converter,’ or ‘ADC.’” *Id.* at 42. Patent Owner concludes that without disclosing an encoding step, Harvey cannot disclose “storing *said encoded physiological data*.” *Id.* at 43.

We determine, on this record, Petitioner establishes sufficiently for the purposes of institution that Harvey discloses encoding and storing sensor signals as encoded physiological data (limitations 5[C] and 5[D]). Petitioner cites to Harvey for disclosing sensors that sense preselected parameters and provide sensed data to microcontroller 5110. Pet. 20–21 (citing Ex. 1004, 39:4–5). Harvey discloses storing the sensed data in memory and wirelessly transmitting the data using a digital protocol. *Id.* at 21, 23 (citing Ex. 1004, 10:3–11:3, 24:20–23, 42:36–43:20, 11:20–24, 29:16–24, 30:6–9; Ex. 1002 ¶ 65). Although Harvey does not expressly disclose an ADC, we are persuaded on this preliminary record, there is a reasonable likelihood that Harvey necessarily requires the analog signals to be encoded into digital form to be stored in memory and to be wirelessly transmitted using a digital protocol. Ex. 1002 ¶ 87.

d) Limitations 5[E]–5[G]

Petitioner asserts Harvey discloses the steps of “enabling a radio signal generator located within said bolus” (limitation 5[E]), “activating said

radio signal generator at predetermined intervals to generate a radio signal to carry said encoded physiological data” (limitation 5[F]), and “generating said radio signal having a frequency of between about 700 MHz to about 1 GHz” (limitation 5[G]). Pet. 23–27 (citing Ex. 1004, Fig. 5, 29:17–18, 42:3–11, 43:4–44:2, 14:1–3, 11:20–22, 26:6–11, 27:14–21, 43:4–6; Ex. 1002 ¶¶ 67–75). Specifically as to limitation 5[F], Petitioner asserts Harvey discloses “[t]he IAT transponder can transmit outbound messages in a ‘periodic’ manner using a ‘preselected tag transmission interval’ such as every two seconds.” *Id.* at 26 (citing Ex. 1004, 26:6–11). As to the “predetermined” limitation, Petitioner asserts “[t]he IAT transponder may be assigned its ‘selected tag transmission interval’ during manufacture or by self-assignment.” *Id.* (citing Ex. 1004, 27:14–21, 28:22–27, 32:12–19, 65:32–66:2, 66:19–22, Fig. 9).

Patent Owner does not dispute that Harvey discloses limitation 5[G]. *See* Prelim. Resp. 43–49. On this record and for the purposes of institution, we are sufficiently persuaded by Petitioner’s argument and evidence that Harvey discloses limitation 5[G], and we address Patent Owner’s argument as to limitations 5[E] and 5[F].

Patent Owner argues that Harvey does not disclose limitation 5[E] for the same reasons as limitation 5[A], namely that Harvey does not disclose a radio signal generator located within a bolus. *Id.* at 34–41. As discussed above (section III.F.2.b.), Petitioner identifies Harvey’s disclosures of IAT 1110, that may be a digestive tract bolus device, and XPDR 5000 that includes a radio signal generator. *See* Pet. 23–24 (citing Fig. 5). But, on the current record, Petitioner does not expressly connect Harvey’s digestive tract bolus device to XPRD 5000, at least to meet the anticipation standard. *See supra* (section III.F.2.b.).

Patent Owner also argues that Harvey does not disclose limitation 5[F] requiring “[t]hat the radio signal generator be activated to generate a radio signal at ‘pre-determined intervals,’ which is a set and known period of time as explained in the ’644 Patent.” Prelim. Resp. 43 (citing Ex. 1001, 10:31–43, 11:16–20). Patent Owner argues that “[t]he ‘predetermined’ claim element also requires that the specific radio signal transmitted ‘carry’ the ‘encoded physiological data’ of the animal, as opposed to providing mere identification information or pings.” *Id.* (citing Ex. 1004, 4:39–41, 10:31–43, 11:16–27, claim 5).

Patent Owner further argues that Harvey’s disclosed transmission interval of “about 2 seconds” relates to “a ‘collision avoidance protocol,’ [where] the transmission is simply a ‘ping’ to determine if the channel is clear and, critically, does not carry any ‘encoded physiological data’ as required by the claims.” *Id.* at 44 (citing Ex. 1004, 25:2–6, 27:6–8; Ex. 2001 ¶ 78). Instead of carrying physiological data, the pings are used to avoid collisions due to multiple transponders transmitting to the same interrogator at the same time. *Id.* at 44–45 (citing Ex. 1004, 25:30–26:6). According to Patent Owner, “[c]ritically, only if one of the pings is acknowledged at an undetermined time does Harvey actually transmit physiological data.” *Id.* at 45 (citing Ex. 1003 ¶¶ 25:4–6; Ex. 2001 ¶¶ 79–80). Patent Owner also argues that the “two second transmission” interval for transmitting encoded physiological would not apply to a bolus as the “configuration would quickly drain the battery and diminish the operational lifespan of the bolus.” *Id.* at 46 (citing Ex. 2001 ¶ 81).

Apart from the “collision avoidance protocol,” Patent Owner argues Petitioner fails to show “why a POSA would have understood the outbound IAT messages to necessarily include ‘encoded physiological data’ instead of,

for example, a ping, a registration message, or identification data.” *Id.* at 47 (citing Ex. 2001 ¶ 83). Patent Owner further argues that Petitioner’s additional citations to Harvey for “pre-determined intervals” “fail to describe transmission intervals, the transmission of encoded physiological data, or even the same embodiments in some instances.” *Id.* at 48 (citing Ex. 2001 ¶ 85). Finally, Patent Owner restates its prior art argument that Petitioner’s anticipation ground improperly relies on combining separate embodiments in Harvey. *See id.*

We determine that, on this record, Petitioner sufficiently shows that Harvey discloses “activating said radio signal generator at predetermined intervals to generate a radio signal to carry said encoded physiological data.” Pet. 23–26 (citing Ex. 1004, 14:1–3, 7–9; 17:18–22, 25:8–11, 25:30–26:11, 27:14–21, 28:22–27; Ex. 1002 ¶¶ 71–74). Harvey discloses that IAT 1110 (e.g., a digestive tract bolus device) may transmit an outbound IAT message including stored subject data, i.e., encoded physiological data. Ex. 1004, 14:1–3, 7–9, 17:18–22. As Patent Owner identifies, Harvey discloses alternative transmit messages, including transponder pings for identifying the transponder to the interrogator. *See* Prelim. Resp. 44–45 (citing Ex. 1004, 25:1–5; 27:6–8; Ex. 2001 ¶ 78). Along with multiple transmit message types, Harvey discloses alternative transmit operations, including “periodic or aperiodic” “preselected tag transmission interval[s].” Ex. 1004, 26:6–11. Given the various alternative disclosures of transmit messages and operations, the question at issue is whether Harvey “explicitly contemplates the combination of the disclosed functionalities.” *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1343 (Fed. Cir. 2016). On this record, we find that Petitioner sufficiently shows that Harvey discloses the combined functionalities.

For example, Harvey discloses multiple examples of predetermined periodic transponder operations and messaging. *See* Ex. 1004, 26:6–11, 27:14–21, 28:22–27. Although one of the periodic transponder operations is described as a collision avoidance protocol, we are not persuaded on this record that the collision avoidance protocol is limited to pings or excludes transmitting encoded physiological data. *See id.* at 25:30–26:11. Rather the paragraph discussing the collision avoidance protocol does not distinguish between message types, any of which could be subject to communication collision. *See id.* Likewise, Harvey’s 2-second interval is a non-limiting embodiment (*see* Ex. 1004, 26:9) that does not necessarily distinguish Harvey’s disclosure from the ’644 patent’s claimed unspecified “pre-determined intervals.” *Contra*, Ex. 1001, 10:31, 11:16–20.

Separately, Harvey lists both transponder pings and monitored subject information as non-limiting examples of selected transmit operations. *See* Ex. 1004, 25:1–11. However, Harvey’s purpose is to transmit animal information using the transponder. *See id.* at 11:20–22; *see also* Ex. 1002 ¶ 71 (“[A] POSA would understand that it would make no sense for the orally-administered bolus to take sensor measurements but not to transmit them.”). Accordingly, on the preliminary record, we find that one skilled in the art would have combined Harvey’s periodic transmission intervals with messages including encoded physiological data.

e) Conclusion as to Claim 5

Based on the current record, questions remain as to whether Petitioner has established a reasonable likelihood that claim 5 is anticipated by Harvey, as Petitioner appears to rely on separate embodiments in Harvey (IAT 1110 and XPDR 5000) without showing how those embodiments are connected. *See, e.g.*, section III.F.2.(b).

3. *Analysis of Claim 6*

Petitioner asserts that Harvey discloses the “frequency . . . selected from the group consisting of: between about 700 MHz to about 800 MHz, 750 MHz to about 850 MHz, about 800 MHz to about 900 MHz, 850 MHz to about 950 MHz, 900 MHz to about 1 GHz.” Pet. 27. Specifically, Petitioner asserts that Harvey discloses transceivers that “can operate in the 850–950 MHz frequency range.” *Id.* (citing Pet. 26–27; Ex. 1004, 43:4–6, 55:14–18).

Patent Owner does not dispute Petitioner’s showing as to claim 6. However, claim 6 depends from claim 5 and Petitioner’s argument therefore faces the same questions as to claim 5, whether Petitioner has established a reasonable likelihood that claim 5 is anticipated by Harvey.

G. *Asserted Obviousness of Claims 5 and 6 over Harvey and Risky*

Petitioner contends that claims 5 and 6 would have been obvious over the combination of Harvey and Risky. Pet. 38–43. Patent Owner disputes Petitioner’s contentions. Prelim. Resp. 52–60.

Petitioner states

[t]o the extent Patent Owner alleges that either Harvey or Risky fails to teach any claim element, that element is provided by the other reference. Further, to the extent the teachings of Harvey are substantively different than Risky for any given claim element, it would have been at least obvious to try Risky’s implementation of that element in Harvey, or vice versa, given the overall similarity in their purpose, design and operation.

Pet. 42. Petitioner concludes “[s]ince a POSA would have been motivated to combine Harvey and Risky [(citing Pet. 38–42)], and since the combination

meets all elements of Claims 5 and 6, those claims are obvious over the combination.” *Id.* at 43 (citing Ex. 1002 ¶ 103).

Patent Owner responds that Petitioner does not articulate a proper obviousness analysis. Prelim. Resp. 53–54. Specifically, Patent Owner argues Petitioner fails to “identify a primary reference, the missing elements of that reference, or what teachings of the secondary reference should be applied.” *Id.* at 54. Patent Owner concludes “[b]ecause Petitioner[] ha[s] not established that a combination of Harvey and Risky satisfies every element of the challenged claims and fail[s] to engage in a proper obviousness analysis, the Board should decline institution based on Ground 3.” *Id.* at 60.

We agree with Patent Owner that, on this record, Petitioner fails to engage in a proper obviousness analysis. Petitioner must explain with particularity how the prior art would have rendered the challenged claims unpatentable. *See* 35 U.S.C. § 312(a)(3). Petitioner’s obviousness ground combining Harvey and Risky does not meet this requirement. *See Sisvel Int’l S.A. v. Sierra Wireless, Inc.*, 82 F.4th 1355, 1364 (Fed. Cir. 2023) (“[T]he Petition does not explain what reference is the primary versus secondary reference, what elements are missing from the primary reference, what elements should be added from the secondary reference to reach the claimed invention, or why those particular elements would be obvious to add.”).

Instead, Petitioner invites the Board to review Patent Owner’s preliminary response and predict Petitioner’s reply. *See* Pet. 42 (“To the extent Patent Owner alleges that either Harvey or Risky fails to teach any claim element, that element is provided by the other reference.”). But what happens when Patent Owner argues both Harvey and Risky lack the same element? For example, “neither Risky nor Harvey discloses activating a

radio signal generator at ‘pre-determined intervals’ to carry ‘physiological data.’” Prelim. Resp. 58. Under Petitioner’s rubric the Board could add Risky’s burst or on-line modes to Harvey, add Harvey’s periodic preselected tag transmission interval to Risky, or fashion some other combination of the references and their features. Given that it is Petitioner’s burden from the onset to show with particularity why the patent it challenges is unpatentable, we decline to fashion an obviousness argument for Petitioner. Accordingly, on this record, we determine that Petitioner has not shown a reasonable likelihood that claims 5 and 6 would have been obvious over Harvey and Risky.

H. Asserted Obviousness of Claim 7 over Harvey and Rettedal

Petitioner contends that claim 7 would have been obvious over the combination of Harvey and Rettedal. Pet. 43–49. Patent Owner disputes Petitioner’s contentions. Prelim. Resp. 60–61.

1. Rettedal (Ex. 1006)

Rettedal relates to “an animal monitoring device configured as a bolus for oral administration to reside in an animal’s stomach.” Ex. 1006 ¶ 2. The bolus may contain “microprocessors for processing animal identification information and the signal from a temperature sensor to provide encoded data representations which can be transmitted by radio-frequency to a radio-frequency receiver.” *Id.* ¶ 3.

Rettedal identifies a problem with a conventional bolus whereby “the mass of the animal in which the bolus has a location can demodulate the frequency of the radio signal such that the radio signal has a different frequency at the point of transmission than the frequency of the radio signal after passing through the mass of the animal.” *Id.* ¶ 6. Rettedal addresses this problem by providing “a network frequency match element . . . to

compensate for the mass of the animal such that the radiofrequency signal generated by the animal monitoring device antenna located inside the animal can be received by the radio frequency reader antenna located outside of the animal.” *Id.* ¶ 11; *see also id.* ¶ 64.

2. *Reason to Combine Harvey and Rettedal*

Petitioner asserts “Harvey and Rettedal provide substantial motivation to combine these references and to add the matching elements disclosed in Rettedal to Harvey’s bolus.” Pet. 43. For example, Petitioner argues that Rettedal describes improving “prior-art animal-monitoring boluses (which would include Harvey’s bolus)” by providing a “network frequency match element.” *Id.* at 45 (citing Ex. 1006 ¶¶ 11, 64). Petitioner cites Rettedal for teaching the “network frequency match element (118) can include capacitors and resistors in combination to deliver a particular first radio frequency signal . . . to the antenna (90) [and to] compensate for demodulation of the radio frequency signal (13) due to interaction with the mass of animal.” *Id.* (citing Ex. 1006 ¶ 64, Fig. 6) (alterations in the original).

Petitioner asserts that a “POSA would have understood, at least from Rettedal, that Harvey’s implanted bolus would experience this same problem since it is surrounded by the animal’s mass.” *Id.* at 46 (citing Ex. 1002 ¶¶ 105–108). Because Rettedal provides a solution to the same problem, Petitioner asserts “a POSA would have been motivated to apply that solution to Harvey’s bolus.” *Id.* (citing Ex. 1002 ¶ 108). Petitioner adds that both Harvey and Rettedal teach similar components (*id.* at 43–45) and “the technology and operation of such components was well-understood in the relevant time period such that the combination of Harvey and Rettedal would have had a high likelihood of success” (*id.* at 47, citing Ex. 1002 ¶ 109).

Patent Owner argues that Petitioner fails “to explain how or why a POSA would have had a reasonable expectation of success in incorporating Rettedal’s teachings into Harvey’s tag.” Prelim. Resp. 61. Patent Owner argues that Petitioner’s reference to well-known components is “conclusory” and Petitioner provides “no evidence or adequate explanation to support a reasonable expectation of success in modifying Harvey in view Rettedal.” *Id.*

On this record and for the purposes of institution, we are sufficiently persuaded by Petitioner’s argument and evidence that one skilled in the art would have been motivated to combine Harvey and Rettedal and had a reasonable expectation of success in doing so. First, Petitioner raises a reasonable likelihood that one of ordinary skill in the art would have been motivated by Rettedal’s express teaching of improving an implanted bolus device for reporting sensor information by adding a network matching element. *See KSR*, 550 U.S. at 417 (“[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.”).

Second, Petitioner cites both testimonial and documentary evidence to support a reasonable expectation of success, including evidence provided by the cited prior art itself. *See* Pet. 43–45 (citing Ex. 1004; Ex. 1006); Ex. 1002 ¶¶ 105–109; *see also PAR Pharm., Inc. v. TWI Pharms., Inc.*, 773 F.3d 1186, 1198 (Fed. Cir. 2014) (“The prior art also identified that one of the key benefits of the . . . technology was its simplicity. The reasonable expectation of success requirement for obviousness does not necessitate an absolute certainty for success.”). Accordingly, on this record, Petitioner

provides evidence or adequate explanation to support a reasonable expectation of success in modifying Harvey in view of Rettedal.

3. “[W]herein said bolus further comprises matching elements”

Claim 7 depends from claim 6 and recites “wherein said bolus further comprises matching elements which adjusts said frequency of said radio signal to compensate for a change in said frequency of said radio signal due to passing through a mass of said ruminant animal.” Ex. 1001, 21:53–57.

Petitioner asserts that Harvey teaches *or renders obvious* every element in claims 5 and 6 from which claim 7 depends. Pet. 47–48 (citing Pet. 16–27) (emphasis added). Petitioner asserts that “Rettedal teaches matching elements for adjusting the frequency of a radio signal to compensate for a change in the signal’s frequency due to its passing through the mass of the ruminant animal in which the bolus resides.” *Id.* at 48. Specifically, Petitioner cites Rettedal’s “matching network 118” that “adjusts the frequency of the radio signal to compensate for the effect that the mass of the animal has on the radio signal.” *Id.* (citing Ex. 1006 ¶¶ 11, 64, Fig. 6).

Patent Owner argues “[a]s discussed for Ground 1, Harvey fails to disclose many of the elements recited in claim 5,” and Petitioner does “not contend that Rettedal addresses Harvey’s deficiencies.” Prelim. Resp. 60 (citing Pet. 47–49; Ex. 2001 ¶¶ 102–103). Patent Owner does not address Rettedal’s teachings. *See id.* at 60–61.

As discussed above, on the current record, Petitioner cites to different embodiments in Harvey to show the bolus element, without expressly tying the embodiments together. *See* Section III.F.2.b. But unlike its anticipation argument over Harvey, Petitioner challenges claim 7 as obvious over the combination of Harvey and Rettedal, both of which teach or suggest a bolus

device. *See* Ex. 1004, 11:10–14; Ex. 1006, Abstr., ¶¶ 22–23. On the present record, Rettedal teaches a bolus device that resides in an animal’s stomach, combined with the digestive tract bolus device (IAT 1110) in Harvey, as argued by Petitioner.

Accordingly, on this preliminary record, there is a reasonable likelihood that Petitioner will prevail in demonstrating that claim 7 is unpatentable as being obvious Harvey and Rettedal.

I. Asserted Obviousness of Claims 9 and 10 over Harvey and Kunda

Petitioner contends that claims 9 and 10 would have been obvious over the combination of Harvey and Kunda. Pet. 49–66. Patent Owner disputes Petitioner’s contentions. Prelim. Resp. 61–66.

1. Kunda (Ex. 1007)

Kunda relates to a small antenna for use in portable wireless communication devices. Ex. 1007 ¶¶ 2, 6. Kunda describes an antenna “configured so that the direction of current flow in the second loop conductor part is the reverse of the direction in the first loop conductor part, making it possible to reduce the interference between the first and second loop conductor parts.” *Id.* ¶ 8. According to Kunda, “interference between the first and second loop conductor parts can be reduced even if the first and second loop conductor parts are placed close together. And this makes it possible to reduce the antenna size while maintaining satisfactory characteristics.” *Id.* ¶ 20.

Kunda illustrates an embodiment of the antenna in Figure 3b, reproduced below.

(b)

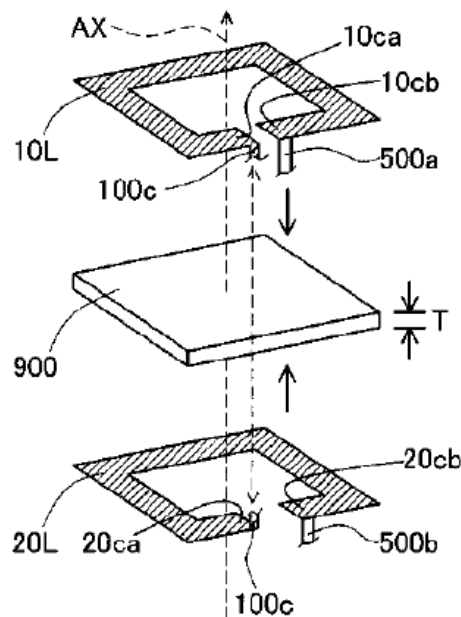


Figure 3b shows an exploded view of antenna 100. *Id.* ¶ 33. Antenna 100 includes planar plate-like dielectric substrate 900, having a thickness T. *Id.* First loop conductor part 10L and second loop conductor part 20L are both formed in the loop shapes that go around axis AX (shown perpendicular to the first and second loop conductor parts). *Id.* First loop conductor part 10L is formed on one side of dielectric substrate 900, and second loop conductor part 20L is formed on the reverse side. *Id.*

2. Reason to Combine Harvey and Kunda

Petitioner asserts “motivation to add Kunda’s antenna to Harvey’s bolus is expressly provided in both references.” Pet. 50. Petitioner asserts that Harvey describes the need for a miniature transponder with a compact form factor to create a bolus that would fit within the digestive tract of a monitored animal. *Id.* (citing Ex. 1004, 11:10–13, 18:15–17). Petitioner asserts that “because Kunda’s double-loop antenna saves space—a benefit touted by Kunda—a POSA would consider it well-suited for use in Harvey’s

cattle bolus.” *Id.* (citing Ex. 1007, Abstr., ¶¶ 6, 8, 20, 57, 77–78; Ex. 1002 ¶¶ 114–115).

Petitioner further asserts that Kunda touts additional benefits for its double loop antenna, including increased bandwidth (*id.* at 51, citing Ex. 1007 ¶ 66) and improved performance “by configuring the loops such that their magnetic fields interact with each other constructively, not destructively” (*id.* at 51–52, citing Ex. 1007 ¶¶ 30, 45–48, 49, 50–57, 70, 75, Figs. 6(a)–7(c)). Petitioner asserts that one skilled in the art would recognize “the advantage that Kunda’s antenna confers in maintaining antenna emission efficiency while allowing small size, providing additional motivation to combine it with wireless devices such as Harvey’s.” *Id.* at 52 (citing Ex. 1002 ¶ 118). Petitioner adds that both Harvey and Kunda teach similar components (*id.* at 53–54) and “the technology and operation of such components was well-understood in the relevant time period such that the combination of Harvey and Kunda would have had a high likelihood of success” (*id.* at 53, citing Ex. 1002 ¶ 119).

Patent Owner argues that Petitioner fails “to explain how or why a POSA would have had reason to modify Harvey to incorporate Kunda’s antenna.” Prelim. Resp. 62. First, Patent Owner argues that there is no need to apply Kunda’s space-saving benefits because “Harvey never mentions or suggests a concern related to the size of a ‘bolus’ or any other device that must fit inside an animal’s digestive tract.” *Id.* at 62–63 (citing Ex. 2001 ¶ 110). Instead, Patent Owner argues that “Harvey never addresses such concerns, and instead focuses on ear tags affixed to the exterior of an animal’s body.” *Id.* (citing Ex. 1004, 19:10–20:12, Figs. 1, 3A–3B; Ex. 2001 ¶¶ 109–110).

On the current record, we find Petitioner’s argument on size considerations more persuasive as Harvey expressly refers to a “digestive tract bolus device” (Ex. 1004, 11:10–14) that would have benefitted from Kunda’s smaller antenna (*see* Ex. 1002 ¶ 115). Additionally, Harvey’s preference for “a more compact form factor” (Ex. 1004, 18:14–17) would apply to an ear tag and bolus alike. *See KSR*, 550 U.S. at 417 (“[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.”).

Second, Patent Owner argues, contrary to the ’644 patent, Kunda “does not describe an antenna capable of counteracting the unique electrical problems experienced when used in a bolus located *inside a body*.” Prelim. Resp. 64. Patent Owner contends Kunda’s antenna is designed for mobile phone use, not an animal’s reticulum and thus does not address “necessary design focuses for an antenna in a bolus.” *Id.* at 64–65 (citing Ex. 2001 ¶ 111). Patent Owner further argues that one skilled in the art “would not be able to conclude from Kunda’s disclosures that its antenna works in a bolus” and “[t]here would thus be no reason to combine Kunda with any of the alleged art.” *Id.* at 65 (citing Ex. 2001 ¶ 111).

On the current record, we find that Petitioner provides at least one reason to combine Harvey and Rettedal, to provide a smaller antenna for an animal bolus. Petitioner need not show that “the motivation be the *best* option, only that it be a *suitable* option from which the prior art did not teach away.” *PAR Pharm.*, 773 F.3d at 1198. Accordingly, on this record, Kunda need only teach that its antenna is a suitable option for a smaller antenna, absent some teaching away.

Thus we arrive at teaching away, Patent Owner’s third argument. *See* Prelim. Resp. 65–66. Patent Owner begins by arguing that one skilled in the art “would have considered it to be impractical to include Kunda’s antenna in Harvey’s device, where antennas are embedded in a printed circuit board.” *Id.* (citing Ex. 1004, 45:12–15; Ex. 2001 ¶ 113). Instead, “Kunda explains that ‘if the antenna is placed close to a printed circuit board or housing in order to reduce the size of the communication device, that will diminish the characteristics of the antenna.’” *Id.* at 66 (citing Ex. 1007 ¶ 5). Patent Owner further argues “Kunda teaches away from using its antenna in smaller devices, expressly suggesting that helical antennas be used to meet the ‘demands for smaller antennas for use in portable wireless communication devices.’” *Id.* (citing Ex. 1007 ¶¶ 2, 3; Ex. 2001 ¶ 113).

On the current record, we find Petitioner’s argument more persuasive as to Kunda’s express teachings. Patent Owner cites Kunda’s discussion of the problems of “prior art” helical coils, not the disclosed embodiments. *See* Ex. 1007 ¶¶ 2, 3, 5. Petitioner instead cites to Kunda’s teachings that the “first and second loop conductor parts being formed on a dielectric substrate” “makes it possible to reduce the antenna size while maintaining satisfactory characteristics.” *See* Pet. 50–51; Ex. 1007 ¶¶ 8, 9. Accordingly, on this record, we are not persuaded that Kunda teaches away from the combination.

On this record and for the purposes of institution, we are sufficiently persuaded by Petitioner’s argument and evidence that one skilled in the art would have been motivated to combine Harvey and Kunda and had a reasonable expectation of success in doing so.

3. *Independent Claim 9*

Independent claim 9 recites similar subject matter to claim 5. *See* Ex. 1001, 22:14–34. Unlike claim 5, claim 9 does not recite “pre-determined intervals” and specific radio signal frequency ranges. *See id.* For the preamble and steps 9[A]–9[F], Petitioner applies Harvey’s same teachings as it did with claim 5. *See* Pet. 55–56 (citing Pet. 16–26); arguing that “Element 9[A] is identical to Element 5[A]” and “Element 9[E] is identical to Element 5[E]. Both are taught by Harvey.”).

a) Limitations 9[A]–9[F]

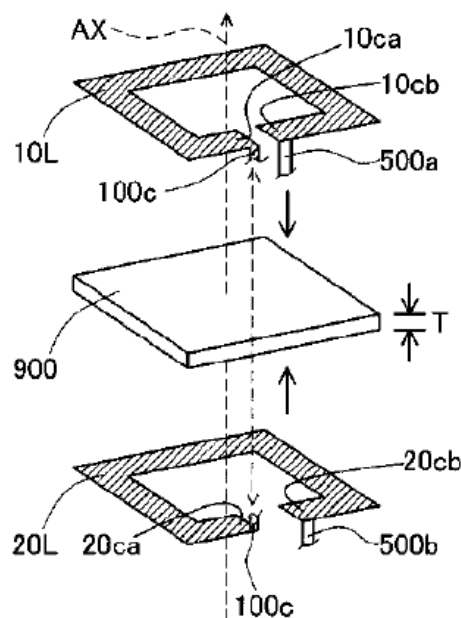
Petitioner asserts that claim 9 would have been obvious over Harvey and Kunda. We previously found that Petitioner sufficiently shows Harvey teaches claim 5’s preamble and limitations 5[B]–5[D] and 5[F], corresponding to claim 9’s preamble and limitations 9[B]–9[D] and 9[F]⁸, respectively. *See supra* §§ III.F.2.a–d. We also addressed the deficiencies in Petitioner’s anticipation argument as to limitations 5[A] and 5[E]. *See supra* §§ III.F.b, d. But as discussed above in the reason to combine Harvey and Kunda, we are persuaded by Petitioner’s argument that it would have been obvious to one skilled in the art to modify Harvey’s digestive tract bolus device with a smaller antenna to provide a more compact form factor for an implantable device. *See supra* § III.I.2. Accordingly, we are persuaded that Harvey teaches or suggests a bolus orally administered to a ruminant animal (limitation 9[A]) including a radio signal generator located within said bolus (limitation 9[E]).

⁸ Limitation 9[F] recites “activating said radio signal generator” but does not require limitation 5[F]’s “pre-determined intervals.”

b) Limitation 9[G]

Claim 9 recites step 9[G], “transmitting said radio signal with an antenna having a pair of electrically conductive loops disposed a distance apart and further comprising transmitting said radio signal through said antenna.” Ex. 1001, 22:31–34. Petitioner asserts that Kunda teaches this step. Pet. 56–61. Specifically, Petitioner asserts “Kunda’s radio communications module transmits radio signals using an antenna 100 comprising ‘first loop conductor part 10L and . . . second loop conductor part 20L, which circle around the same imaginary axis.’” *Id.* at 56–57 (citing Ex. 1007, Abstr., Claims 1–7, ¶¶ 1, 5, 7–21, 23–26, 28–57, Figs. 1–7) (alteration in original). As an example, Petitioner cites Kunda’s Figure 3b, reproduced below.

(b)



Petitioner asserts that the Figure shows “loops 10L and 20L . . . disposed a distance T apart, where T is the thickness of the dielectric substrate 900 separating the loops.” *Id.* at 57–58 (citing Ex. 1007 ¶ 33, Figs. 3(a), (b)).

Patent Owner argues “as discussed in Ground 1, Harvey fails to disclose ‘one or more sensors contained in a bolus,’ . . . the ‘encoding’ step and ‘encoded physiological data,’ . . . or ‘a radio signal generator located within said bolus.’” Prelim. Resp. 62 (citing Ex. 2001 ¶¶ 105–106). Apart from arguing that there was no reason to combine Harvey and Kunda, Patent Owner does not argue that Kunda does not teach step 5[G]. *See id.* at 61–62.

We addressed Harvey’s teachings as to sensors contained in a bolus, encoding step, and radio signal generator, above in section III.F.2. On this record and for the purposes of institution, we are persuaded by Petitioner’s argument that Kunda teaches limitation 5[G].

c) Conclusion as to Claim 9

Based on the current record, there is a reasonable likelihood that Petitioner will prevail in demonstrating that claim 9 is unpatentable as obvious over Harvey and Kunda.

4. Analysis of Claim 10

Petitioner asserts that Kunda teaches “wherein said pair of electrically conductive loops each comprise a loop of conductive sheet material having an inner annular edge and an outer annular edge which join opposed loop faces.” Pet. 61–66. Specifically, Petitioner asserts that Kunda teaches “electrically conductive antenna loops are formed from conductive sheet material” (*id.* at 61–62, citing Ex. 1007 ¶¶ 33, 36; Ex. 1002 ¶ 135) with inner and outer annular edges which join opposed loop faces (*id.* at 62–65, citing Ex. 1007, Fig. 3(b), 8(a), 11(a); Ex. 1002 ¶ 136).

Patent Owner does not dispute Petitioner’s showing as to claim 10. Patent Owner may raise any arguments regarding claim 10 in its Patent Owner Response after institution. On the present record, Petitioner shows sufficiently that Kunda teaches the limitation of claim 10.

J. Discretionary Denial under 35 U.S.C. § 325(d)

The Director may deny institution of *inter partes* review when “the same or substantially the same prior art or arguments previously were presented to the Office.” 35 U.S.C. § 325(d). We apply a two-part test when evaluating whether to exercise discretion under § 325(d). *See Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 8 (Feb. 13, 2020) (precedential) (“*Advanced Bionics*”). Specifically, we consider:

- (1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office;
- and (2) if either condition of first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.

Id. In doing so, we consider the factors discussed in *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 (Dec. 15, 2017) (precedential as to § III.C.5, first para.; informative) (“*Becton, Dickinson*”). *Id.* at 9–11.

1. Advanced Bionics Part One

Petitioner asserts that “Harvey and Kunda neither were before the Examiner nor are ‘substantially the same’ as the prior art considered by the Examiner.” Pet. 75–76. Petitioner asserts that “[a]lthough Risky and Rettedal were before the Examiner, there is no evidence that either was considered meaningfully. Furthermore, Risky and Rettedal could not have been considered within the combinations asserted here because the other asserted references were not before the Examiner.” *Id.* at 76.

Patent Owner argues “that Risky and Rettedal were presented to the

Patent Office in an [Information Disclosure Statement (IDS)] during prosecution of the '644 Patent" and "were initialed by the Examiner." Prelim. Resp. 16 (citing Ex. 1010, 163, 174, 203, 205). Patent Owner argues that Harvey and Kunda are substantially the same as the art considered by the Examiner. *See id.* at 17–24. Specifically, Patent Owner argues "Harvey is substantially the same as Risky." *Id.* at 17–21. As evidence of the similarities between Harvey and Risky, Patent Owner restates Petitioner's comparison of Harvey and Risky in the obviousness ground as to claim 5. *See id.* at 19–20 (citing Pet. 39–40). Patent Owner further argues that Kunda is substantially the same as Goto,⁹ as both references disclose first and second loop antennas disposed on opposite sides of a conductor plane. *Id.* at 21–22 (citing Ex. 2003, Abstr., ¶¶ 1, 131, Fig. 5; Ex. 2001 ¶ 67). Patent Owner asserts that Goto was previously presented to the Office, being disclosed on an IDS signed by the Examiner. *Id.* at 23 (citing Ex. 1010, 445).

We agree with Patent Owner that Risky and Rettedal were previously presented to the Office. *See Advanced Bionics*, Paper 6 at 7–8 ("Previously presented art includes art made of record by the Examiner, and art provided to the Office by an applicant, such as on an Information Disclosure Statement (IDS), in the prosecution history of the challenged patent."). Accordingly, we determine that *Advanced Bionics* part one is satisfied.

2. *Advanced Bionics Part Two*

"If the 'same or substantially the same prior art or arguments previously were presented to the Office,' then the Board's decisions generally have required a showing that the Office erred in evaluating the art or arguments." *Advanced Bionics*, Paper 6 at 8. "An example of a material

⁹ US 2010/0302039 A1 (Ex. 2003).

error may include misapprehending or overlooking specific teachings of the relevant prior art where those teachings impact patentability of the challenged claims.” *Id.* at 8 n.9. Similarly, *Becton, Dickinson* factors (c), (e), and (f) relate to whether the petitioner has demonstrated a material error by the Office. *Id.* at 10. “For example, if the record of the Office’s previous consideration of the art is not well developed or silent, then a petitioner may show the Office erred by overlooking something persuasive under factors (e) and (f).” *Id.*

Petitioner addresses *Advanced Bionics* part two. Pet. 76–77. Specifically, Petitioner asserts “there is no evidence that Risky or Rettedal received meaningful consideration; neither appears in an Office Action or any other substantive discussion in the prosecution file. The lack of any evidence that the Examiner meaningfully considered Risky or Rettedal favors institution.” *Id.*

Patent Owner argues that Petitioner does “not point to a single purported error by the Office during examination of the ’644 Patent” and, therefore, fails to meet its burden to show material error. Prelim. Resp. 24. For example, Patent Owner argues that Petitioner does not suggest “that the Examiner erred in her analysis of Risky or Rettedal or somehow erroneously overlooked their relevance.” *Id.* at 25. Moreover, Patent Owner argues that the “Petition never alleges that the Office materially erred in its evaluation of any previously presented art. Nor does the Petition identify any specific teachings in Risky, Rettedal, or any other references that the Examiner may have misapprehended or overlooked during prosecution.” *Id.* at 26.

On this record, we determine Petitioner meets its burden to show material error. First, by referencing and addressing the references in a

discussion of *Advanced Bionics* part two, Petitioner implicates material error by the Office. Pet. 76–77. Second, by arguing that Risky and Rettedal were not meaningfully considered by the Office, Petitioner asserts that the material error was overlooking the specific teachings of the relevant prior art. *See Advanced Bionics*, Paper 6 at 10. As we discuss at length above, Petitioner raises a reasonable likelihood that claim 5 is unpatentable as anticipated by Risky and claim 7 is unpatentable as obvious over Harvey and Rettedal. *See above*, §§ III.E. and III.H. Because these references were marked as considered by the Office, but were not applied to reject the claims, we conclude that the Office erred by overlooking the specific teachings of Risky and Rettedal discussed in this Decision. Accordingly, we decline to exercise our discretion to deny institution under 35 U.S.C. § 325(d).

IV. CONCLUSION

For the foregoing reasons, Petitioner has demonstrated a reasonable likelihood that at least one challenged claim of the '644 patent is unpatentable over the prior art of record. Accordingly, we institute an *inter partes* review on claims 5–7, 9, and 10 for all grounds set forth in the Petition.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314, an *inter partes* review is instituted on claims 5–7, 9, and 10 for all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, *inter partes* review of the '644 patent shall commence on

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the entry date of this Order, and notice is hereby given of the institution of a trial.

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