

Filed on behalf of ST Reproductive Technologies, LLC.
By: Daniel L. Moffett (dmoffett@akingump.com)
AKIN GUMP STRAUSS HAUER & FELD LLP
112 E. Pecan Street, Suite 1010
San Antonio, Texas 78205
Tel: (210) 281-7106
Fax: (210) 224-2035

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SMAXTEC INC. and
SMAXTEC ANIMAL CARE GMBH,
Petitioners

v.

ST REPRODUCTIVE TECHNOLOGIES, LLC,
Patent Owner

Case IPR2024-01067
Patent No. 10,231,644

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

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EXHIBIT LIST

Exhibit	Description
EX2001	Declaration of Dr. Edwin Kan
EX2002	<i>Curriculum Vitae</i> of Dr. Edwin Kan
EX2003	U.S. Patent Publication No. 2010/0302039 (“Goto”)
EX2004	Disclaimer of Claim 13 of U.S. Patent No. 10,231,644

I. INTRODUCTION

Pursuant to 35 U.S.C. § 313, Patent Owner ST Reproductive Technologies, LLC (“Patent Owner”) submits this Patent Owner Preliminary Response to smaXtec Inc. and smaXtec Animal Care GmbH’s (“Petitioners”) Petition for *inter partes* review (“IPR”) of claims 5-7, 9, 10, and 13 of U.S. Patent No. 10,231,644 (EX1001, “the ’644 Patent”). The Board should not institute IPR because, as discussed below, the Petition is replete with statutory deficiencies and dispositive evidentiary gaps.

First, the Board can—and should—exercise its discretion under 35 U.S.C. § 325(d) to deny institution of the Petition before reaching the merits. Petitioners rely on prior art references that are the same or, based on Petitioners’ own characterization, substantially the same, as art previously considered by the Examiner during prosecution of the ’644 Patent. And, critically, Petitioners fail to demonstrate—or even identify—a single material error by the Examiner in evaluating the art. *See Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 8 (P.T.A.B. Feb. 13, 2020) (precedential) (“If a condition in the first part of the framework is satisfied and the petitioner fails to make a showing of material error, the Director generally will exercise discretion not to institute *inter partes* review.”).

Second, to the extent the Board reaches the merits, it should deny institution because Petitioners fail to establish a reasonable likelihood of success on any of the asserted grounds. For example, Petitioners fail to show that either of the base references, Harvey and Risky, disclose or suggest activating a radio to transmit animal physiological data at “pre-determined intervals.” Additionally, Harvey fails to disclose that the claimed methods are achieved with an internal “bolus,” as opposed to an external ear tag. Petitioners’ three obviousness grounds also fail because they are defective on their face. In Ground 3, for example, Petitioners merely allege that any unspecified missing element “is provided by the other reference,” essentially tasking the Board with developing its own obviousness combination. This is improper. *See Apple Inc. v. OpenTV, Inc.*, IPR2015-01031, Paper 10, at 13 (P.T.A.B. Oct. 13, 2015). Petitioners’ remaining obviousness combinations likewise fail, because the alleged combinations do not address the deficiencies in the base references.

For these and the additional reasons explained below, the Board should deny institution on all stated grounds.

II. BACKGROUND

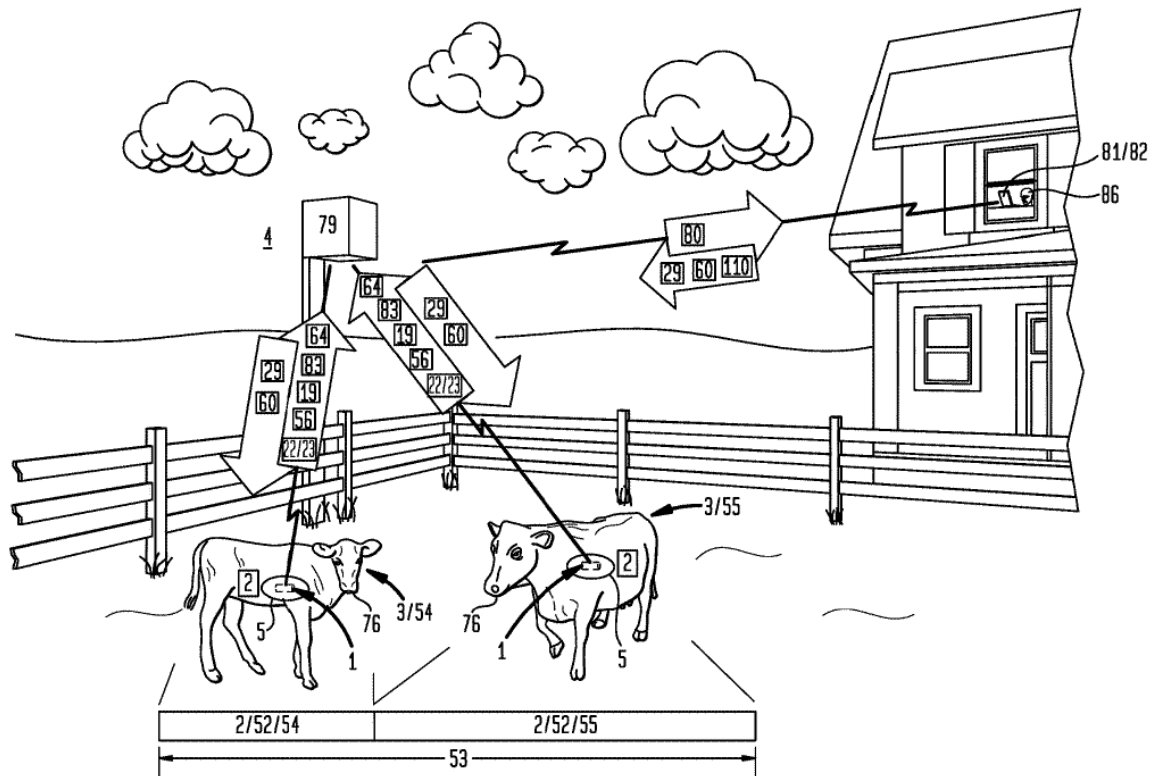
A. The ’644 Patent

The ’644 Patent is directed to methods of monitoring the physiological parameters of a ruminant animal during its lifespan using a bolus that resides in the

animal's reticulorumen. EX1001, Abstract, 1:5-7, Fig. 1, claim 5, 9, 13. As explained in the specification of the '644 Patent, conventional boluses did not have "a configuration capable of oral administration at birth" or "an operational lifespan long enough to monitor useful physiological parameters over the remaining productive lifespan of the ruminant animal," such as a calf or cow. EX1001, 1:18-25. To address these problems in the prior art, the claimed methods disclose a bolus with power-saving features, including a radio signal generator and sensors that operate at certain periods of time based on the animal's life stage. EX1001, 1:41-45, 1:59-66, 7:66-8:12.

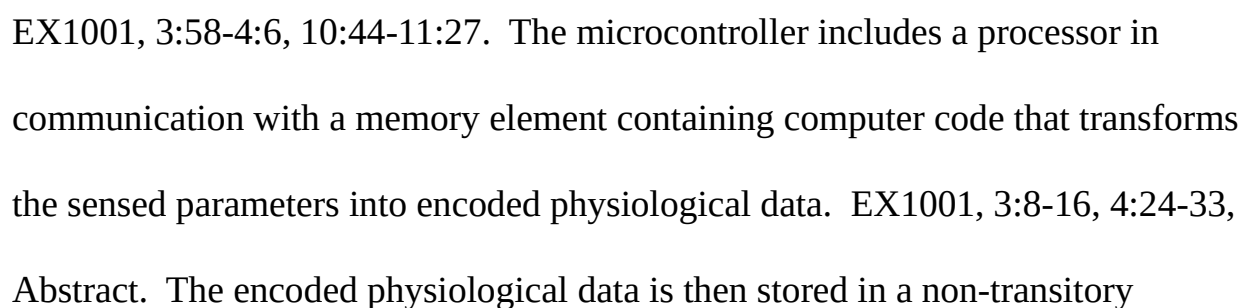
Figure 1 of the '644 Patent illustrates an exemplary diagram of the claimed methods, including an orally-administered bolus (1) in the reticulum of a ruminant animal (e.g., a calf or cow) that communicates with the other components of an animal management system:

FIG. 1



EX1001, Fig. 1, 2:23-26, 2:64-3:16, 7:66-8:3, Abstract.

Figure 2 depicts a block diagram of an embodiment of the bolus (1), which contains one or more sensors (13), a microcontroller (8), a radio signal generator (21), and a power source (46), as shown below:



computer readable media. EX1001, 15:7-10, claims 5, 9. Further, the radio signal generator generates signals with a frequency between about 700 MHz to 1 GHz.

EX1001, 4:42-61.

The bolus also contains a power management module that “functions to regulate energy use by the bolus (1) to extend the operational life of the bolus.” EX1001, 7:56-65. “Because the majority of energy (42) used by the bolus (1) is in operation of the radio signal generator,” as the ’644 Patent specification explains, the power management module can configure the radio signal generator such that it is operational at pre-determined intervals to transmit the encoded physiological data, *e.g.*, every six hours or every 24 hours. EX1001, 9:63-10:3, 10:31-43, 11:16-27, claim 5.

The bolus may also include an antenna with two electrically conductive loops connected to the radio signal generator to transmit the radio signals. EX1001, 6:62-7:20. As explained in the specification of the ’644 Patent, this configuration addresses the “uncontrollable changes in the orientation of the bolus and correspondingly uncontrolled orientation of the bolus antenna in the reticulorumen of the ruminant animal” that cause “variable quality in radio signal transmission from the ruminant animal resulting in the loss of encoded physiological data.” EX1001, 1:25-31; *see id.* at 2:10-16, 7:32-33, Figs. 4-13.

B. Challenged Claims

Petitioners challenge claims 5-7, 9, 10, and 13, among which claims 5, 9, and 13 are independent. App'x A; EX2001, ¶¶38-43. Claim 13 has been disclaimed by Patent Owner (*see* EX2004) and, therefore, cannot form a basis for institution. *See* 37 C.F.R. § 42.107(e).

C. The Asserted Art

1. Risky (EX1005)

Risky is a U.S. patent publication titled “System and Method for Monitoring a Health Condition of an Animal.” As Petitioners acknowledge, Risky was presented to the Patent Office during prosecution of the '644 Patent, and the Examiner initialed the IDS to indicate that the reference was considered. *See* Pet., 13 (“Risky appears in the prosecution history of the '644 Patent in a September 23, 2015 IDS initialed by the examiner.”) (citing EX1010, 174, 203).

Risky generally relates to systems and methods for monitoring a health condition of an animal. EX1005, Abstract, [0001], Figs. 1, 2; EX2001, ¶¶55-58. Unlike the patented invention, Risky does not describe transmitting animal physiological data at “pre-determined intervals.” EX2001, ¶57. Instead, Risky describes transmitting a message at a “transmission frequency” that depends entirely on specific triggering “events,” such as “changing animal health conditions” or a change in the animal’s “location.” EX1005, [0043], [0048]-

[0049]; EX2001, ¶57. Risky explains that it is configured in this manner—i.e., to change frequencies based on events instead of at specified pre-determined intervals—so that such changes in the animal’s health or location may be recognized sooner. EX1005, [0048], [0142]; EX2001, ¶57.

According to Petitioners, Risky describes two embodiments that relate to transmission interval/frequency: (i) “burst” mode, and (ii) “on-line” mode. EX1005, [0049], [0053]. Petitioners rely on both modes to argue 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 in claim 5. As discussed in more detail below for Ground 2, these modes do not satisfy this claim limitation. *See infra* Section VI.C. For example, the “burst” mode in Risky uses a “transmission interval” that is not pre-determined, but is instead dependent on the animal’s health conditions and triggering events that affect the delay applied between transmissions. *Id.* And the purported “interval” in the “on-line” mode relates to transmissions of bolus identifiers, not the encoded physiological data required by claim 5. *Id.*

2. Harvey (EX1004)

Harvey, by Petitioners’ own characterization, is substantially the same as Risky, although it is even further afield from the claimed invention. *See, e.g.*, Pet., 41 (“Harvey and Risky teach the same kind of device used for the same

purpose.”). Harvey is generally directed to a “subject management system” using an “intelligent active tag” (“IAT”) that is “attached to a monitored subject.”

EX1004, Abstract, 1:1-2, 2:16-26, Figs. 1-3B; EX2001, ¶¶47-54. Figure 1 provides an illustration of the subject management system, depicting an IAT (e.g., 1110) attached to the ear of an animal subject (e.g., 1010), as shown below:

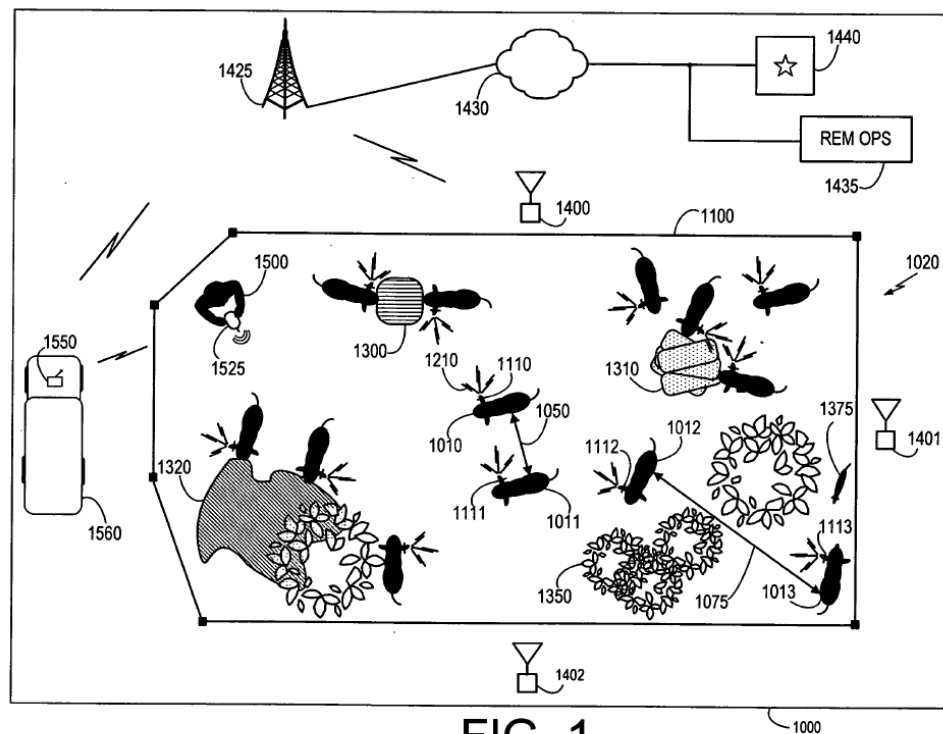


FIG. 1

EX1004, Fig. 1, 6:11-12; *see, e.g., id.*, 8:5-7, 11:8-10 (“[A]n active tag, such as IAT 1110, may be secured to monitored subject 1010 as a collar, bracelet, ring, or apparel, or as an ear tag, tail tag, or piercing stud.”), Fig. 3A (depicting an IAT affixed to an ear of cattle). The IAT includes a power source and transponder. EX1004, 18:3-17, 18:34-19:9.

Petitioners rely on an “intelligent transponder (XPDR)” embodiment designated as 5000 in Harvey’s figures and specification. *See* Pet., 18-27; EX1004, 22:29-30. Figure 5 is reproduced below and depicts a block diagram of the embodiment:

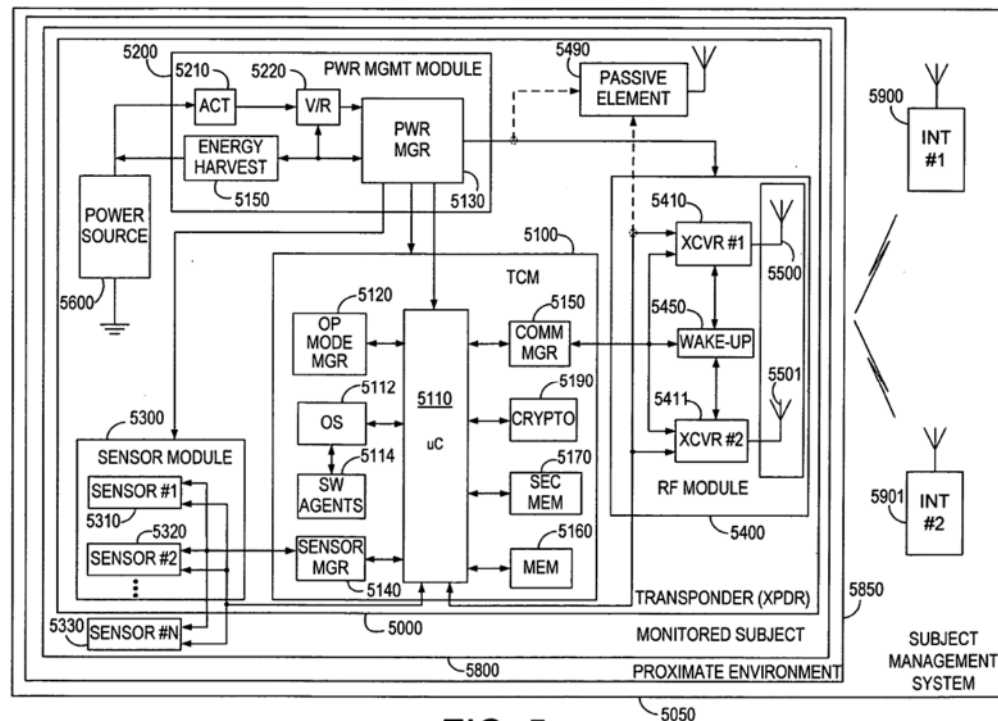


FIG. 5

EX1004, Fig. 5, 6:25-26, 22:29-30. The XPDR 5000 communicates with an interrogator (e.g., 5900). EX1004, 22:35-36.

Harvey differs from the challenged claims in multiple ways, as described in detail below. First, the XPDR 5000 embodiment that Petitioners rely upon is not a “bolus” as recited in the claims. *See* Section VI.B.1. Instead, based on the specification and the particular sensors used in that embodiment, a POSA would

interpret the asserted Harvey device to be an external ear tag unsuitable for use in a bolus configuration. *Id.*; EX2001, ¶¶50-54. In addition, like Risky, Harvey does not disclose activating the radio at “pre-determined intervals” to transmit physiological data from the animal. *See* Section VI.B.3. Instead, again like Risky, Harvey’s cited disclosures describe transmission of a ping to initiate communication with a reader before physiological data can be sent. *Id.* Harvey also fails to disclose “encoding” sensor signals, as recited in every challenged claim. *See* Section VI.B.2.

3. Rettedal (EX1006)

Rettedal is a U.S. patent application publication titled “Animal Monitoring System.” As Petitioners acknowledged, Rettedal was presented to the Patent Office during prosecution of the ’644 Patent, and the Examiner initialed the IDS to indicate that the reference was considered. *See* Pet., 14 (“Rettedal appears in the prosecution history of the ’644 Patent in a June 12, 2015 IDS initialed by the examiner.”) (citing EX1010, 163, 205).

Petitioners contend that Harvey in combination with Rettedal renders obvious claim 7 (Ground 4). Petitioners rely on Rettedal for only the “matching elements” limitation in claim 7. Pet., 48-49. Otherwise, Petitioners rely solely on Harvey for the elements of claims 5-6, from which claim 7 depends, and they do not contend that Rettedal addresses Harvey’s deficiencies, presumably because

Rettedal likewise fails to disclose or describe, at least, the “activating a radio signal generator at pre-determined intervals” requirement in claim 5. EX2001, ¶¶60-62.

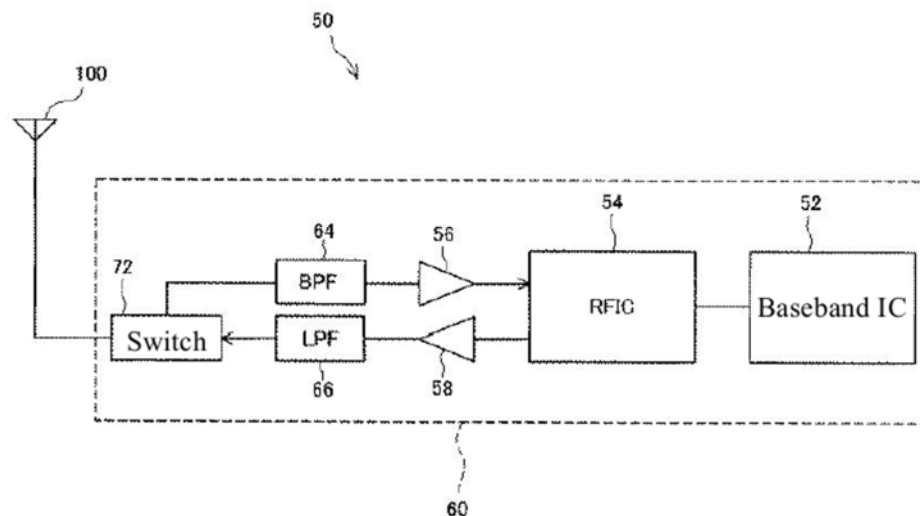
As explained in Section VI.E below, Petitioners fail to meet their burden in Ground 4 to show that a POSA would have had a reasonable expectation of success in incorporating Rettedal’s matching element into Harvey’s exterior ear tag.

4. Kunda (EX1007)

Kunda (EX1007)¹ is a Japanese patent application publication titled “Folded Loop Antenna.” Kunda describes fitting a loop antenna to two integrated circuits, where impedance matching in the signal chain is critical to avoid antenna reflection and severe self-jamming to the RFIC. *See* EX1007, [0024], Fig. 1 (baseband IC 52 and RFIC 54); EX2001, ¶¶63-64.

¹ Patent Owner reserves the right to object to Petitioners’ translation of Kunda in the event that the Petition is instituted.

Figure 1



EX1007, Fig. 1. Kunda describes a use case of a general communication integrated circuit with a transmitter and receiver, such as for use in mobile phones, where antenna reflection is the key design point. *See id.*; EX1007, [0001]-[0002], [0024]. Kunda is substantially the same as art that was considered by the Examiner during prosecution of the '644 Patent, namely U.S. Patent Publication No. 2010/0302039 ("Goto"). *See* EX2003; EX2001, ¶¶65-67. Both describe a double-loop antenna directed to use in a general communication device. *Id.* And neither discloses the ability to transmit signals from within an animal or in a bolus configuration. *Id.*

III. THE BOARD SHOULD EXERCISE ITS DISCRETION TO DENY THE PETITION UNDER § 325(D)

The Board should exercise its discretion to deny institution of the Petition under 35 U.S.C. § 325(d) because Petitioners rely entirely on the same or

substantially the same prior art as that already presented to the Patent Office, and Petitioners failed to make *any* argument that the Patent Office erred in its review of that art. In assessing whether to exercise its discretion, the Board applies a two-part framework that “reflects a commitment to defer to previous Office evaluations of the evidence of record unless material error is shown.” *Advanced Bionics*, Paper 6 at 8-9.

Under the first part of the framework, the Board considers “whether the same or substantially the same art was previously presented to the Office or whether the same or substantially the same arguments were presented to the Office.” *Id.* at 8. Previously presented art includes “art provided to the Office by an applicant, such as on an Information Disclosure Statement (IDS).” *Id.* at 7-8. In determining whether cited art is “substantially the same” as previously presented art, the Board often considers (a) “the similarities and material differences between the asserted art and the prior art involved during examination,” and “(b) the cumulative nature of the asserted art and the prior art evaluated during examination.” *Id.* at 9-10, n.10 (citing *Becton, Dickinson and Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 at 17-18 (Dec. 15, 2017)). Petitioners bear the burden of establishing that a reference is not the same or substantially the same as art previously presented art. *Ecofasten Solar, LLC v. Unirac, Inc.*, IPR2021-01379, Paper 11 at 38-39 (P.T.A.B. Feb. 8, 2022) (citing *Harmonic Inc. v.*

Avid Tech., Inc., 815 F.3d 1356, 1363 (Fed. Cir. 2016); *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375 (Fed. Cir. 2015)).

Under the second part of the framework, the Board looks at “whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.” *Id.* at 8. When “the first part of the framework is satisfied and the petitioner fails to make a showing of material error, the Director generally will exercise discretion not to institute *inter partes* review.” *Id.* at 8-9. Importantly, the burden is firmly on Petitioners to identify a purported material error made by the Office. *See Advanced Bionics*, Paper 6 at 8 (“If the petitioner fails to show that the Office erred, the Director may exercise his discretion not to institute *inter partes* review.”); *Fitesa Simpsonville, Inc. v. Procter & Gamble Co.*, IPR2023-01451, Paper 11 at 19 (P.T.A.B. Mar. 20, 2024) (“Petitioner bears the burden of showing that the Examiner materially erred.”).

A. The Same or Substantially the Same Art Was Previously Presented to the Patent Office

The first part of the *Advanced Bionics* framework is readily satisfied here because all of the art cited by Petitioners was either presented to the Patent Office during prosecution of the '644 Patent or is substantially the same as the presented art. Both Risky and Rettedal were expressly disclosed in an IDS submitted to the Examiner, and the Examiner signed the IDS to confirm that each reference was considered. EX1010, at 203. As for Harvey and Kunda, they are substantially the

same as art disclosed in an IDS and considered by the Examiner during prosecution.

1. Risky and Rettedal Are the Same Art Previously Presented to the Patent Office

Petitioners do not dispute that Risky and Rettedal were presented to the Patent Office in an IDS during prosecution of the '644 Patent or that the references were initialed by the Examiner. See Pet., 13 (“Risky appears in the prosecution history of the '644 Patent in a September 23, 2015 IDS initialed by the examiner.”), 14 (“Rettedal appears in the prosecution history of the '644 Patent in a June 12, 2015 IDS initialed by the examiner.”), 76 (“Risky and Rettedal appear is in the above-referenced IDSs. . . . [T]he Examiner signed the IDSs and added the footnote “ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH.”); EX1010, 163, 174, 203, 205. In signing the IDS, the Examiner represented that she expressly considered Risky and Rettedal. *Id.*

Petitioners argue that disclosure of the references in an IDS is insufficient under § 325(d) unless there is evidence that they were “considered meaningfully.” Pet., 76. But the Board has previously rejected this precise argument in its application of *Advanced Bionics*. In *Biocon Pharma Ltd. v. Novartis Pharmaceuticals Corp.*, the Board held that a prior art reference had been “presented previously” to the Office and “considered” under *Advanced Bionics* where (as here) “the Examiner signed an IDS listing” the reference and stated (as

here) that “all references considered except where lined through.” IPR2020-01263, Paper 12 at 9 (P.T.A.B. Feb. 16, 2021). The Board expressly rejected the argument advanced by Petitioners that discretionary denial should be denied where the references were “not applied by the Examiner.” *Id.* Instead, the Board correctly accepted the Examiner’s representation that the references had in fact been considered as true. *Id.*

The reasoning in *Biocon* equally applies here, where Risky and Rettedal were listed on an IDS, and the Examiner signed the IDS with the statement “ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH.” EX1010, 203, 205. The Examiner did not line through Risky or Rettedal. *See id.* Thus, these references satisfy the first part of *Advanced Bionics* as previously presented art.

2. Harvey and Kunda Are Substantially the Same as Art Previously Presented to the Patent Office

Petitioners make a conclusory assertion that Harvey and Kunda are not “‘substantially the same’ as the prior art considered by the Examiner” during the ’644 prosecution, but they provide no support or evidence for that argument. Pet., 75. To the contrary, Petitioners go out of their way to highlight the identity between Harvey and the Risky reference considered by the Examiner in their obviousness grounds. And because Kunda is substantially the same as Goto, a patent publication disclosed in an IDS and considered by the Examiner, every

reference in the Petition was either before the Office during prosecution, or substantially same as that art. Accordingly, Petitioners have failed to meet their burden to establish that Harvey and Kunda are not substantially the same as art that was already considered during prosecution. *See Ecofasten*, Paper 11 at 38-39 (“Petitioner does not present any evidence or argument to persuade us that Hideyuki or Donauer are not the same or substantially the same as the prior art raised during the original prosecution or reexamination. Petitioner has the burden of proof to establish that it is entitled to the relief requested.”).

a) Harvey is Substantially the Same Art as Risky

Petitioners’ own characterization and treatment of Harvey and Risky establishes that Harvey is substantially the same as Risky, which was already considered by the Office. In fact, Petitioners expressly rely on the identity of the two references to demonstrate a purported “substantial motivation to combine” the references in their Ground 3 obviousness challenge. In that discussion, Petitioners do not identify a single difference between Risky or Harvey or point to a single invalidating feature or disclosure that Harvey adds to the previously-considered Risky. To the contrary, Petitioners’ expressly state that “Harvey and Risky teach the same kind of device used for the same purpose” and “came up with the same solution to the same problem” identified in the ’644 patent. Pet., 41-42.

Petitioners provide numerous examples of what they believe to be similarities between the two references in satisfaction of *Becton, Dickinson* factors (a) and (b). According to Petitioners and their expert, “similarities and common features” of Harvey and Risky include the following (Pet., 39; EX1002, ¶97):

- “[T]he devices described in Harvey and Risky are the same type of apparatus used for the same purpose.” (Pet., 38; EX1002, ¶96);
- “Each is an electronic bolus with sensors, configured to reside in the stomach of a ruminant animal and measure the animal’s physiological parameters.” (Pet., 38; EX1002, ¶96);
- “Each wirelessly transmits those parameters to a monitoring station so that the health and breeding status (e.g., estrus) of each animal can be monitored.” (Pet., 38-39; EX1002, ¶96);
- Both purportedly describe “[r]adio communications” in the same band. (Pet., 39; EX1002, ¶97);
- Both purportedly involve “[a]ctivating the radio signal generator only at pre-determined intervals.” (Pet., 39; EX1002, ¶97);
- Both purportedly involve “[e]nabling sensors only when needed, and disabling them at other times.” (Pet., 39; EX1002, ¶97); and

- “Harvey and Risky both recognized and solved [the] same problem—extending the operational life of a bolus.” (Pet., 40 EX1002, ¶98).

At no point in their discussion of the “similarities and common features” of Harvey and Risky do Petitioners state or suggest that Harvey operates in a way that is distinct from Risky or otherwise not cumulative of that reference. As Dr. Kan explains, neither Petitioners nor their expert have identified a difference between Harvey and Risky, and they appear to apply the same analysis for both references. EX2001, ¶59.

Moreover, when addressing the alleged combination of Harvey and Risky, Petitioners reiterate their position that the references are not “substantively” different and are unable to articulate any distinction between their teachings. Petitioners state that “*to the extent* the teachings of Harvey are substantively different than Risky for any given 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 (emphasis added). Not a single exemplary difference or combination is provided, however. And the only specific claim element Petitioners identify in their combination discussion is “oral administration” of the bolus. See Pet., 42-43. But for that element, Petitioners contend oral administration is either “inherent” or “obvious”

in *both* Harvey and Risky for the same reason. Accordingly, Petitioners' argument and evidence uniformly establishes that Harvey does not add any meaningful disclosure beyond what was already before the Office in Risky. Harvey therefore satisfies the first part of the *Advanced Bionics* framework.

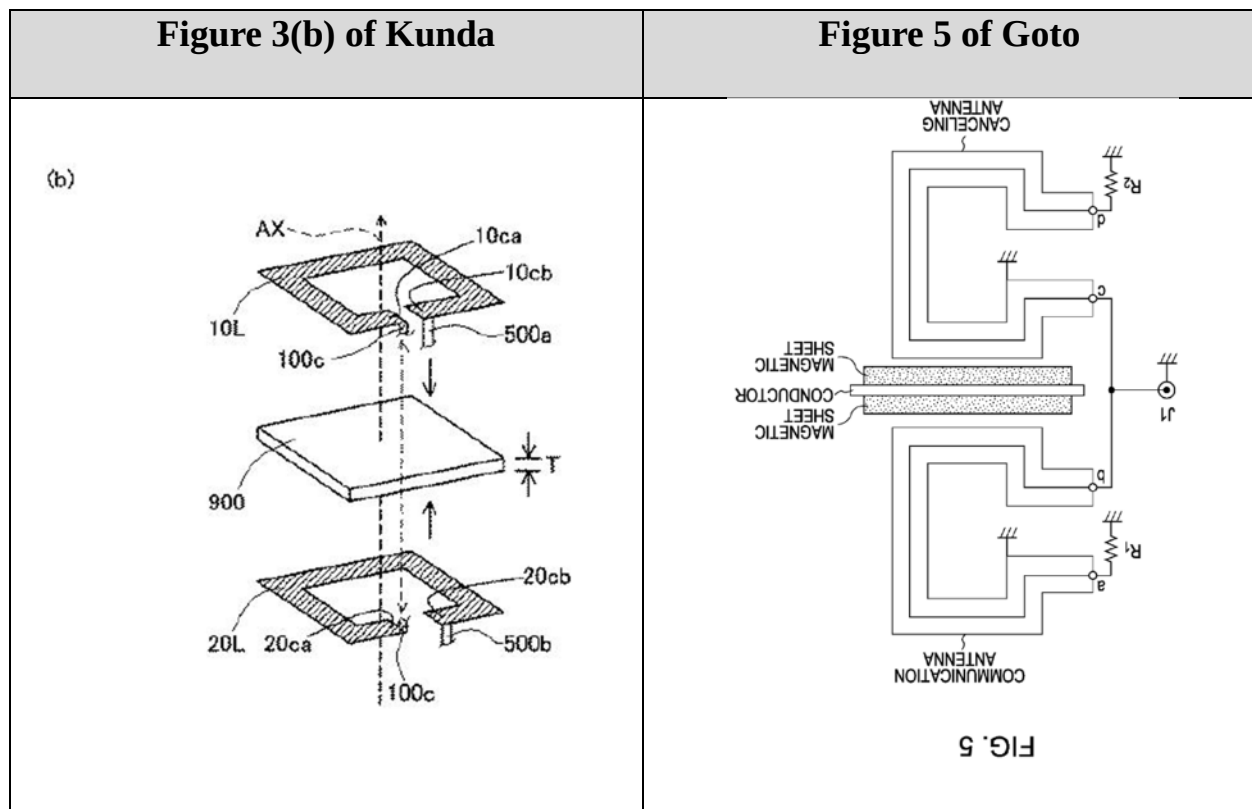
b) Kunda is Substantially the Same Art as Goto

Kunda is substantially the same as art that the Examiner considered during prosecution of the '644 Patent. Petitioners rely on Kunda solely for the limitations related to an "antenna having a pair of electrically conductive loops" (i.e., element 9[G] and claim 10), arguing that Kunda teaches "antennas which each comprises a pair of electrically conductive loops disposed on either side of a dielectric substrate—*e.g.*, loops 10L and 20L and substrate 900 depicted in Figs. 3(a) and 3(b).'" Pet., 14, 56. Petitioners further argue that Kunda discloses that "loops 10L and 20L are disposed" apart by "the thickness of the dielectric substrate 900 separating the loops." *Id.*, 58.

But substantially similar teachings were already before the Examiner during prosecution. Similar to Kunda, Goto describes a communication device with a "first loop antenna" disposed on one surface a conductor plane and a "second loop antenna" disposed on the opposite surface of the conductor plane, such that the two "loop antennas" are "vertically symmetrical" to each other. EX2003, Abstract, [0001], [0131]; *see, also, id.*, [0042], [0048], [0113]-[0116], [0126], [0131],

[0140], [0144], claims 1, 7; EX2001, ¶66. Goto discloses that the antennas “face each other within a short distance” and “have an equal relation with each other.” EX2003, [0116], [0128]. Goto’s two loop antennas are depicted in Figures 2, 4, and 5 of Goto. EX2003, Figs. 2, 4, 5. Figure 5 has been reproduced below for reference.

The similarities of Kunda and Goto can be seen, for example, by the below side-by-side of their figures:



EX1007, Fig. 3(b); EX2003, Fig. 5 (rotated 180°). As shown above, Kunda’s loop antennas 10L and 20L are substantially similar to Goto’s communication antenna and cancelling antennas. EX2001, ¶67. And Kunda’s substrate 900 is disposed

between its two antennas in substantially the same way that Goto's conductor is disposed its two antennas. *Id.*

Similar to Risky and Rettedal, Goto was expressly disclosed on an IDS, and the Examiner signed the IDS with the statement "ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH." EX1010, 445. The Examiner did not line through Goto. *Id.* Thus, Goto is also previously presented art under the first part of *Advanced Bionics*.

The Examiner considered Goto and nevertheless allowed the claims of the '644 Patent. EX1010, 445. And rightly so, because Goto, like Kunda, fails to teach or suggest a use case involving a bolus or the transmission of radio signals from the inside of an animal's reticulum. Nor does either reference disclose a solution for the unique problems that the '644 Patent sought to solve—e.g., the impact of changes in the orientation of a bolus and antenna when inside a ruminant animal's reticulum or the interference, bandwidth, and attenuation problems encountered when transmitting signals through the mass of the animal. EX1001, 7:20-33. Accordingly, because of the similarities and cumulative nature of Kunda and Goto, Kunda satisfies the first part of *Advanced Bionics* as substantially the same art.

In short, none of Petitioners’ art supports institution because the art “adds no teaching that was not before the Examiner.” *Dr. Reddy’s Labs. S.A., v. Indivior UK Limited*, IPR2019-00328, Paper 21 at 16 (P.T.A.B. June 3, 2019); *cf. Intelligent BioSystems, Inc. v. Illumina Cambridge Ltd.*, IPR2013-00324, Paper 19 at 6-7 (P.T.A.B. Nov. 21, 2013) (institution denied where the cited references contained “substantially the same” teachings as the references in the first petition); *Gardner Denver, Inc. v. Utex Indus., Inc.*, IPR2020-00333, Paper 12 at 12 (P.T.A.B. Aug. 5, 2020) (denying institution where although the cited reference “was not disclosed to the Office during prosecution, the Office already considered references that disclosed similar teachings,” including a reference “submitted during prosecution of the ’949 patent and Examiner marked the reference as considered”).

Given what the Patent Office already considered, the Board need not—and should not—waste its resources reconsidering the asserted art in Grounds 1-5.

B. Petitioners Do Not Identify Any Material Error by the Office

Petitioners do not point to a single purported error by the Office during examination of the ’644 Patent and, therefore, fail to meet their burden to show that “the Office erred in a manner material to the patentability of challenged claims,” as required under the second part of the *Advanced Bionics* framework. *Advanced Bionics*, Paper 6 at 8. When addressing “*Advanced Bionics* Part Two,” Petitioners state *only* that (1) “there is no evidence that Risky or Rettedal received

meaningful consideration” and (2) “[t]he lack of any evidence that the Examiner meaningfully considered Risky or Rettedal favors institution.” But Petitioners’ argument, even taken as true, fails to meet their burden under *Advanced Bionics*. What Petitioners never say or even suggest is that the Examiner erred in her analysis of Risky or Rettedal or somehow erroneously overlooked their relevance. Accordingly, there has been no showing, or even allegation, of material error on behalf of the Office. As the Board has explained, “[i]f a condition in the first part of the framework is satisfied and the petitioner fails to make a showing of material error, the Director generally will exercise discretion not to institute *inter partes* review.” *Id.*; see *Fitesa*, Paper 11 at 21 (“Petitioner must demonstrate that the Examiner erred in the evaluation of the prior art, for example, by showing that the Examiner misapprehended or overlooked specific teachings in the relevant prior art such that the error by the Office was material to the patentability of the challenged claims.”).

Even if the Board were to interpret Petitioners’ assertion that Risky, Rettedal, and substantially similar art were not “meaningfully considered” as an allegation of “error,” that is insufficient to meet Petitioners’ burden. The mere fact that the Examiner did not apply Risky or Rettedal in an office action or view them worthy of a rejection or written analysis does not demonstrate material error. See *ABS Global, Inc. et al. v. Cytonome/ST, LLC*, IPR2021-00306, Paper 13 at 13-14

(P.T.A.B. Jun. 7, 2021) (“[W]here Petitioner has made no allegation of material error beyond the allegation that the Examiner did not apply the [asserted] reference and has not pointed out any specific disclosure from [the reference] that was overlooked by the Office, we agree with Patent Owner that Petitioner fails to demonstrate material error.”), *POP request denied*, Paper 16 (P.T.A.B. Sept. 7, 2021), *reh’g denied*, Paper 18 (P.T.A.B. Jan. 7, 2022); *NXP USA, Inc. v. Impinj Inc.*, IPR2020-00519, Paper 7, at 7-8, 13 (P.T.A.B. Aug. 17, 2020) (denying institution under § 325(d) and finding no material error under *Advanced Bionics* where “Petitioner does not identify any error in the Office’s prior consideration” of a reference initialed by the Examiner in an IDS but not applied as part of a rejection).

Although Petitioners foresaw discretionary denial under § 325(d) as an issue and included a section attempting to address it, 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. The Board has found it insufficient to establish material error where a petitioner fails to identify specific teachings or merely disagrees with an Examiner’s conclusion. *See Fitesa*, Paper 11 at 21-22 (finding “the evidence of record insufficient to establish that the Office erred” in light of “Petitioner’s failure

to identify any specific teaching in the references that the Examiner misapprehended or overlooked,” and noting that “Petitioner merely disagrees with the Examiner’s findings and conclusions, which is insufficient to establish material error by the Office”). And to the extent Petitioners contend that the asserted art was not before the Examiner (which it was), they have not explained how their reliance on the art would have been different from what the Examiner considered or how it would have generated a different result.

As discussed, Petitioners never even allege Office error, but a mere allegation alone would not have been sufficient to meet their burden either. The Board has held that bland assertions of Office error are insufficient to satisfy *Advanced Bionics*. In *Biocon Pharma Ltd. v. Novartis Pharmaceuticals Corp.*, the petitioner attempted to make a “showing” of material error by contending that “the Examiner overlooked the specific teaching” in a previously presented reference, and the patent owner rebutted that contention by arguing that the petitioner’s reliance on that teaching was “inapt” because it did not relate to the therapy at issue. IPR2020-01263, Paper 12 at 11-12. The Board found that the patent owner had “the better position” because “Petitioner fail[ed] to show persuasively that the Examiner’s reliance on [another teaching in the reference] within the scope of the claims constitutes a material error under *Advanced Bionics*.” *Id.* at 13-15. The Board’s reasoning in *Biocon* equally applies here, where Petitioners fail to identify

a specific teaching overlooked in a previously presented reference and carry their burden of proof of showing material error.

Petitioners' citations to *Microsoft Corp. v. SurfCast, Inc.*, IPR2022-00590, Paper 9 (P.T.A.B. Oct. 7, 2022) and *Amazon.com, Inc. v. M2M Sols. LLC*, IPR2019-01205, Paper 14 (P.T.A.B. Jan. 27, 2020) actually demonstrate their failure to meet their burden. In both proceedings, the petitioners did far more to demonstrate error than Petitioners have done here by identifying specific arguments and art from related IPRs that the Office overlooked during prosecution and explaining why such errors were "material." In *Microsoft*, the petition expressly alleged that the Office "erred" by failing to "actually consider[]" certain arguments and allowing claims that were "strikingly similar to claims the Board found to be anticipated" by the same cited art in a related IPR. IPR2022-00590, Paper 1, at 7 (P.T.A.B. Feb. 10, 2022). And in *Amazon.com*, the petitioner expressly alleged that the Office "erred" by overlooking the final written decision in an IPR involving a related patent and "materially similar issues, including substantially the same prior art, materially similar claims, and materially similar arguments." IPR2019-01205, Paper 14 at 12. Here, not only did Petitioners fail to identify specific errors as the *Microsoft* and *Amazon.com* petitioners did, they failed to even allege error.

For the reasons above, Petitioners fail to meet their burden to show material error by the Office under the second part of the *Advanced Bionics* framework. The Board should therefore exercise its discretion under § 325(d) to deny institution of the Petition.

IV. PERSON OF ORDINARY SKILL IN THE ART

Petitioners propose 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 sensor systems for humans or other animals. However, additional years of education in the above-referenced fields may compensate for fewer years of experience.” Pet., 5. Solely for purposes of this Paper, Patent Owner applies Petitioners’ proposal. See EX2001, ¶¶19-20.

V. CLAIM CONSTRUCTION

In IPR proceedings, claim terms are given their “ordinary and customary” meanings from the perspective of a POSA and in view of the intrinsic record. See 37 C.F.R. § 42.100(b). Petitioners have not asked for any special constructions for any claim terms. Nor have they argued that the patentees have defined any terms. For this stage of the proceedings, Patent Owner does not believe that any claim term or phrase requires a construction.

VI. PETITIONERS FAIL TO ESTABLISH A LIKELIHOOD THAT ANY CHALLENGED CLAIM IS UNPATENTABLE

To the extent the Board reaches the merits of the Petition, institution should still be denied because Petitioners have not shown a reasonable likelihood that they will prevail on any of their asserted grounds. For each ground, Petitioners fail to show that the asserted prior art disclosed—or why and how the references would have been combined or modified to disclose—each element of the challenged claims. Accordingly, the Board should decline the petition and deny institution of IPR.

A. Legal Standards

1. Standard for Instituting IPR

Petitioners bear the burden of showing that there is a “reasonable likelihood” that they would prevail in their challenge for each challenged claim. 35 U.S.C. § 314(a); 37 C.F.R. § 42.108(c). As the Board has explained, “any petition for *inter partes* review must ‘identif[y] . . . with particularity . . . the grounds on which the challenge to each claim is based.’” *Hopkins Mfg. Corp. v. Cequent Performance Prods., Inc.*, IPR2015-00616, Paper 9 at 7 (P.T.A.B. Aug. 17, 2015) (quoting 35 U.S.C. § 312(a)(3)); *Intelligent Bio-Systems, Inc. v. Illumina Cambridge, Ltd.*, 821 F.3d 1359, 1362 (Fed. Cir. 2016) (stressing that “[i]t is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify ‘with particularity’ the ‘evidence that

supports the grounds for the challenge to each claim”) (quoting 35 U.S.C. § 312(a)(3)). Petitioners “have the burden of proof to establish that it is entitled to the requested relief.” 37 C.F.R. § 42.20(c).

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

2. Standard for Anticipation

“[T]he prior art reference—in order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements ‘arranged as in the claim.’” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008) (quoting *Connell v. Sears Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983)). Thus,

“anticipation is not proven by multiple, distinct teachings that the artisan might somehow combine to achieve the claimed invention.” *Microsoft Corp. v. Biscotti, Inc.*, 878 F.3d 1052, 1069 (Fed. Cir. 2017) (citation and quotation marks omitted); *see In re Gates*, 787 F. App’x 741, 744 (Fed. Cir. 2019) (reversing PTAB affirmance of anticipation rejection because the reference “does not disclose a single device” that included both claim elements at issue). Rather, the cited reference must disclose the claimed invention “without any need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference.” *In re Arkley*, 59 C.C.P.A. 804, 455 F.2d 586, 587 (1972). Similarly, “[w]hen more than one reference is required to establish unpatentability of the claimed invention anticipation under §102 cannot be found.” *Continental Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 1267 (Fed. Cir. 1991); *see Bowser*, ¶23.

3. Standard for Obviousness

To demonstrate obviousness, petitioners must show that “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art.” 35 U.S.C. § 103(a). The first step is “specify[ing] where each element of the claim is found in the prior art patents or printed publications relied upon Moreover, for method claims,

establishing obviousness requires identifying where in the prior art the claimed steps are performed. *See, e.g., Palo Alto Networks, Inc. v. BT Americas, Inc.*, IPR2023-00888, Paper 9 at 34 (P.T.A.B. Nov. 17, 2023) (denying institution where “Petitioner fails to point to a disclosure in Duvall showing that its identified probe performs the step of ‘dynamically modifying an analysis capability of said probe during operation thereof based on said received feedback,’” contrasting “an apparatus claim that recites the mere capability of performing” a function); *ParkerVision, Inc. v. Qualcomm Inc.*, 903 F.3d 1354, 1363 (Fed. Cir. 2018) (affirming determination that method claims were not shown to be obvious where petitioner failed to provide argument or evidence that prior art actually performed the claimed method).

But a patent claim “is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 418 (2007); *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1552 (Fed. Cir. 1983)) (explaining that it was improper for a district court to use the patent claims “as a frame” where “individual, naked parts of separate prior art references were employed as a mosaic to recreate a facsimile of the claimed invention”). Rather, in addition to identifying each element, petitioners must further establish that there was a “reason to combine the teaching of the prior art references to achieve the claimed invention, and that the skilled

artisan would have had a reasonable expectation of success from doing so.” *PAR Pharm., Inc. v. TWi Pharms., Inc.*, 773 F.3d 1186, 1193-94 (Fed. Cir. 2014) (quotes omitted). The reason to combine and reasonable expectation of success must be supported by evidence, not conclusory statements. *KSR*, 550 U.S. at 418; see EX2001, §IV.D.

B. Ground 1: Petitioners Fail to Show That Harvey Anticipates Claims 5-6

Petitioners fail to establish that Harvey discloses all elements of claims 5-6 as arranged in the claims, and instead rely on different teachings in the reference for anticipation. Further, Petitioners fail to explain how or why a POSA would have understood the undisclosed elements to be inherent. As such, Petitioners have not demonstrated that Harvey anticipates claims 5-6 and therefore cannot succeed on Ground 1.

1. Elements 5[A] and 5[E]: Petitioners Fail to Show Sensors “Contained in a Bolus” and a Radio Signal Generator “Located Within Said Bolus”

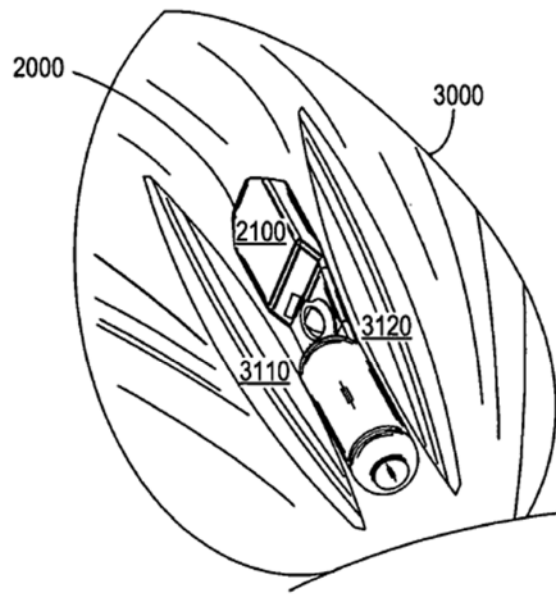
Harvey does not anticipate Claims 5 and 6 because it fails to disclose that the alleged “sensors” and “radio signal generator” are located within a bolus, as recited in elements 5[A] and 5[E]. The ’644 Patent explains that the claimed “bolus” is an internal device that “reside[s] in the reticulorumen of a ruminant animal.” EX1001, Abstract, 1:5-7; see *id.*, 1:18-30, 3:36-38. (“[T]he term ‘reticulorumen (5)’ means the first chamber in the alimentary canal of a ruminant

animal (3) composed of the rumen and reticulum.”), 13:14-24. For anticipation, however, Petitioners rely on an “intelligent transponder (XPDR)” embodiment (designated “XPDR 5000” throughout the reference), which is described only as an external device, such as an animal ear tag. In fact, as discussed below, a POSA would not interpret the XPDR 5000 as being suitable for a bolus configuration based on the types of sensors it contains, and neither Harvey nor Petitioners explain how such a configuration could be achieved. See EX2001, ¶¶ 54, 68-76.

Despite the fact that Harvey never presents the XPDR 5000 transponder as an internal bolus, Petitioners misleadingly refer to the transponder as “Harvey’s bolus” throughout the Petition. Petitioners’ rhetorical choice is based on one conclusory reference to a “bolus” in Harvey. While addressing potential “intelligent active tag” (“IAT”) implementations, Harvey states that “an active tag” may be secured to an animal “as a collar, bracelet, ring, or apparel, or as an ear tag, tail tag, or piercing stud,” or “may be restrained or moveable within monitored subject 1010, for example, as a digestive tract bolus device, or as a miniature transponder lodged or secured within the circulatory system, bone, or soft tissue.” EX1004, 11:9-13. But after this single, conclusory mention, Harvey never again mentions or describes a “bolus” in connection with any embodiment or component, and instead focuses solely on an implementation of an “ear tag” attached to the ear of cattle. See EX1004, 11:4-14, 22:29-30, Fig. 1. Harvey’s “very general”

reference to a bolus, with “no guidance” on how to implement the configuration cannot establish anticipation. *See Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 1572 (Fed. Cir. 1992) (affirming a finding of no anticipation where the reference provided “no guidance as to how to construct a fiberglass cast with the beneficial properties achieved by the [asserted] invention” and “merely states in a very general way that fiberglass can be used”).

In contrast to the single, conclusory mention of a bolus that Petitioners cite, Harvey consistently describes the XPDR 5000 embodiment as an external ear tag, which is how a POSA would interpret the device. EX2001, ¶¶50-54, 71-72. Harvey introduces the XPDR 5000 embodiment illustrated in Figure 5 as “a constituent element of multi-modal intelligent active tag 2000” that can be “coupled to monitored subject 5800, for example, by intimate affixment, as described relative to FIG. 3.” EX1004 22:30-33. Figures 3A and 3B of Harvey illustrate a first form factor of tag 2000 “coupled to monitored subject 1010, by intimate affixment to a surface of cattle ear 3000.” EX1004, 19:13-14. Importantly, Harvey teaches away from a bolus configuration for the XPDR 5000 by expressing the benefits of affixing the tag *externally*, as shown in Fig. 3A, which depicts an ear:

**FIG. 3A**

EX1004, Fig. 3A, 8:19-20, 19:16-17. Specifically, Harvey explains that the tag placement should be in “a region affording visibility of the tag while avoiding permanent physical injury to the subject.” EX1004, 19:19-21. An internal bolus, of course, would not “afford visibility.”

The remaining figures and descriptions in Harvey likewise illustrate that the embodiment Petitioners rely upon is an external tag, as opposed to a bolus.

Figure 1, for example, depicts all tags as affixed to the ears of cattle (e.g., 1010-1113), and Figure 2 illustrates three possible “form factors” of tag 2000, each including an “affixment fitting” 2120, 2220, or 2320, so the tag “may be affixed to the ear of monitored subject.” EX1004, 17:31-33, 18:3-17, Figs. 2A-2C (affixment fitting 2120, 2220, 2320).

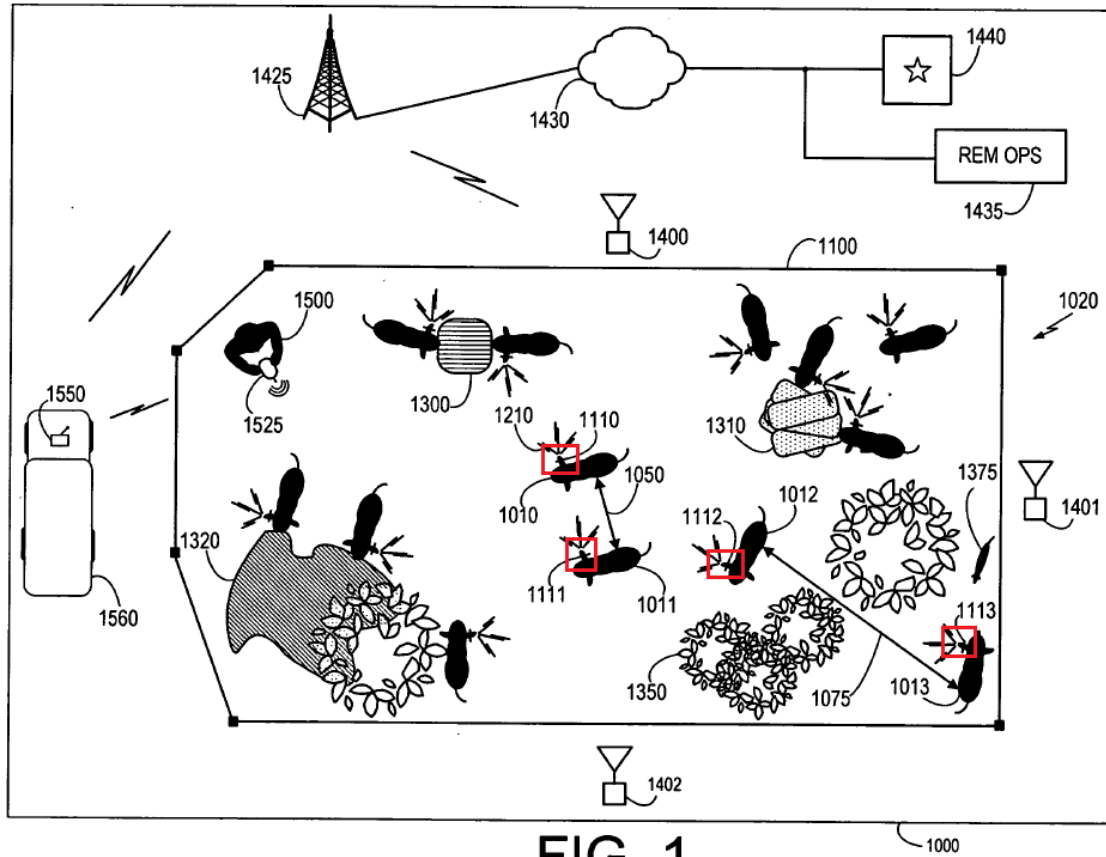


FIG. 1

EX1004, Fig. 1 (annotated).

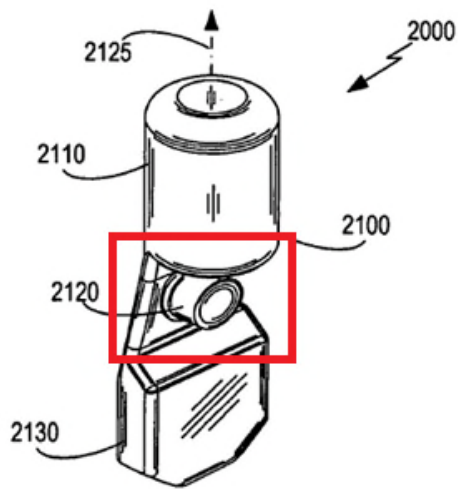


FIG. 2A

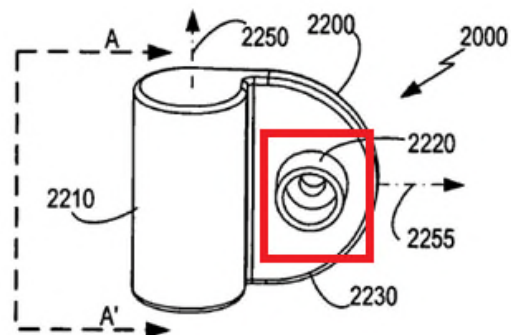


FIG. 2B

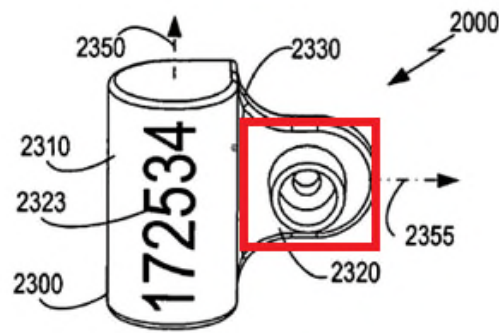


FIG. 2C

EX1004, Figs. 2A-2C (annotated), 17:29-30.

That the embodiment Petitioners rely on is never described or depicted as a bolus is not surprising because a POSA would not understand the XPDR 5000 as being capable of use in a bolus. EX2001, ¶¶73-74. Specifically, Harvey's descriptions of the sensors in the XPDR 5000 demonstrate that they are not—and cannot be—contained in an orally administered bolus. EX2001, ¶74. The signal-producing sensors that Petitioners rely on for anticipation include at least a heart-rate sensor, a humidity sensor, and electrical sensors to measure EEG, ECG, or EMG waves. Pet., 18. As Dr. Kan has testified, however, a POSA would understand that these sensors measure physiological parameters from the *exterior* of an animal and are not possible or practical in a bolus residing *inside* the animal's reticulum. EX2001, ¶74. Specifically, these sensors all require intimate contact to the designated skin electrodes, as opposed to the environment of the digestive tract where a bolus would be located. EX2001, ¶54.

Additionally, Petitioners cite to Harvey's disclosure of a "thermal sensor" for measuring "body temperatures." Pet., 18. When read in context with the other sensors, a POSA would have understood that Harvey's thermal sensors measure temperatures from outside the body, including external body temperature and "ambient" temperatures. EX2001, ¶74. As another example, Harvey discloses that the sensors in XPDR 5000 may sense a "vocalized sound" or an "ambient sound," indicating that the sensors in this transponder are being used in a device attached the outside of the animal's body. EX1004, 40:19-20. A POSA would therefore have understood that Harvey's sensors are contained in a device affixed to the exterior of an animal, such as an ear tag. EX2001, ¶75.

In sum, 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. *See Net MoneyIN*, 545 F.3d at 1369-1371. To the contrary, a POSA would have understood that many of Harvey's sensors would not work within an internal bolus, and neither Harvey, Petitioners, nor Petitioners' expert explain how they could be configured to do so. EX2001, ¶¶73-76. For that reason, and because of its consistent description of the XPDR 5000 as residing in an ear tag, a POSA would interpret Harvey as disclosing an external tag affixed to the exterior of the animal's body. *Id.* Because Harvey fails to disclose a sensor-containing bolus

embodiment as claimed, the Board should decline to institute review based on this ground.

2. Element 5[C]: Harvey Does Not Anticipate the “Encoding” Requirement in Element 5[C]

Petitioners fail to meet their burden of showing that Harvey discloses “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,” as required by element 5[C]. Because Harvey provides no express disclosure of encoding sensors signals into encoded physiological data, Petitioners rely entirely on inherency to demonstrate this element. Petitioners do not adequately explain how this element is necessarily present in the transponder described in Harvey.

Petitioners allege that “[s]ince storage in memory and transmission by a digital protocol involve digital information, not analog signals, Harvey *necessarily* requires the analog signals to be encoded into digital form as physiological data corresponding to the measured physiological parameters.” Pet., 21. Thus, for Petitioners to demonstrate that Harvey meets this element, they must establish that Harvey inherently discloses encoding sensor signals into as encoded physiological data. *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) (“To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference....’ The mere fact that a

certain thing may result from a given set of circumstances is not sufficient.”).

Here, Petitioners do not cite sufficient evidence to establish that analog signals corresponding to physiological parameters are encoded into digital physiological data.

Petitioners also assert that “encoding would occur in an analog-to-digital converter (‘ADC’) within either the sensor module 5300, the sensor manager 5140, or one or more of the sensors themselves.” Pet., 21. Harvey includes detailed schematics, but none illustrate an ADC located in those components, or any other component of XPDR 5000. Petitioners also fail to identify anything in Harvey suggesting that an alleged ADC is included in the sensor module, sensor manager, sensors themselves, or any other component of XPDR 5000. The terms “analog” signals, “digital” signals, “analog-to-digital converter,” or “ADC” are never mentioned in Harvey. Petitioners cite to two recent patents including general ADC and pulse-code discussions, and a dictionary definition of “encode,” but Petitioners do not tie those references back to Harvey or explain how they clearly show that the missing encoding step is necessarily present in Harvey. Petitioners also do not explain why a POSA would have understood the ADC to be inherent.

For the reasons above, Petitioners fail to satisfy their burden of showing that Harvey discloses, expressly or inherently, the “encoding” step and “encoded physiological data” requirement in claim 5. Consequently, Petitioners also fail to

satisfy their burden of showing that Harvey discloses “storing *said encoded physiological data*” and activating the radio signal generator at pre-determined intervals to transmit a “signal to carry *said encoded physiological data*,” as further required by claim 5. Accordingly, Harvey cannot be found to anticipate claims 5-6.

3. Element 5[F]: Petitioners Fail to Show that Harvey Discloses Activating “Said Radio Signal Generator” at “Pre-Determined Intervals to Generate a Radio Signal to Carry Said Encoded Physiological Data”

Harvey also does not disclose “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]. This claim element requires that 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. EX1001, 10:31-43, 11:16-20 (consistently identifying intervals between transmission as periods of time, such as “twenty four hours,” a certain “time period,” and a “period of time”). This is distinct from transmitting at an undetermined period of time, such as activating the radio at random times or in response to a triggering event, such as environmental conditions. The “pre-determined” 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. EX1004, 4:39-41, 10:31-43, 11:16-27, claim 5.

Despite the requirements for the “activating” step, Petitioners incorrectly argue that Harvey’s “IAT transponder” (i.e., XPDR 5000) meets the pre-determined limitations. EX2001, ¶¶77-78. Petitioners contend that the XPDR 5000 “can transmit outbound messages in a ‘periodic’ manner using a ‘preselected tag transmission interval’ such as every two seconds.” Pet., 26. In support, Petitioners cite an example in Harvey where the XPDR “may initiate communication by transmitting an outbound IAT message to INT 5900 on a preselected tag transmission interval” of “about 2 seconds.” EX1004, 26:6-11. But Petitioners misapprehend or misconstrue Harvey, which expressly teaches that these specific “transmissions” are part of a “collision avoidance protocol,” and 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. EX1004, 25:2-6, 27:6-8; EX2001, ¶78.

Harvey’s description of the cited example implementation combined with Harvey’s preceding discussion of communication operations shows that the cited example implementation relates to transponder “ping” messages, and does not transmit a message carrying “encoded physiological data,” as claimed. Harvey explains that the reason for sending a “ping” is to address a scenario where communication contention and collision may occur due to multiple transponders initiating transmit operations to the same interrogator at the same time. EX1004,

25:30-26:6. The “two second transmission” example Petitioners rely on is part of Harvey’s “selected collision avoidance protocol” to address such scenarios. In this protocol, the XPDR 5000 “*initiate[s] communication* by transmitting an outbound IAT message to INT 5900” to avoid collision with other transponders. EX1004, 26:6-8 (emphasis added); EX2001, ¶78. When read in view of Harvey as a whole, a POSA would interpret this outbound message as a mere transponder ping, which may include a TID or an SID, but not encoded physiological data. EX1004, 25:4-6 (stating that the outbound message in the collision avoidance protocol may include tag identifier (“TID”) or subject identifier (“SID”) information); EX2001, ¶¶79-80. Critically, only if one of the pings is acknowledged at an undetermined time does Harvey actually transmit physiological data. *Id.*

This understanding of Petitioners “two second transmission” example is bolstered by the fact that transmitting physiological data every two seconds would make no sense under Petitioners’ interpretation of Harvey. According to Petitioners, Harvey was directed to a way for “extending the operational life of a bolus,” and described “boluses which save energy by controlling the operation of a radio signal generator that transmits sensor data.” Pet., 3, 40. If that were an accurate interpretation of Harvey’s disclosure and purpose (and it is not), it would make no sense that Harvey discloses a “bolus” configuration that transmits physiological data every two seconds to a receiver, consuming a significant amount

of energy in the process. EX2001, ¶¶81-82. For example, a two-second transmission interval would mean that around 43,200 outbound messages of encoded physiological data are being transmitted per day. *Id.* Such a configuration would quickly drain the battery and diminish the operational lifespan of the bolus, which would be counter-productive to the purpose of Harvey according to Petitioners. EX2001, ¶81. Instead, Harvey’s teaching of a two-second interval is more appropriate for an ear tag, where battery preservation is not as stringent as a bolus, and where the ear tag is affixed to the exterior of the cow and more accessible than a bolus, which resides inside the reticulum of the cow. *Id.* It is also more appropriate for transmissions containing, for example, location data or tracking data, rather than transmissions of physiological data. *Id.*

In an attempt to make up for Harvey’s failure to disclose the “activating” step, Petitioners load several different arguments and citations into one final paragraph for this section in the Petition, without any explanation as to how the information demonstrates anticipation of this element. Pet., 26. For example, Petitioners and their expert make the conclusory assertion that the RF module and RF transceivers are “***necessarily*** activated at the beginning of each transmission interval in order to transmit the IAT message containing the encoded physiological data.” Pet., 26. To show that is necessarily true, Petitioners need to establish that Harvey inherently discloses in the cited example implementation activating the RF

module and transceivers at each transmission interval to transmit the encoded physiological data. *See In re Robertson*, 169 F.3d at 745. Neither Petitioners nor their expert cite any evidence to support their argument. They also fail to explain why or how a POSA would have understood that to be case—e.g., 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. EX2001, ¶83. As Dr. Kan explained above, based on the discussion of communication operations in preceding the example implementation relied on by Petitioners, it makes more sense that Harvey is describing a ping operation for initiating communication with the interrogator, and not necessarily sending physiological data. *Id.* Thus, Petitioners fail to establish that Harvey discloses the step of activating “said radio signal generator.”

Additionally, Petitioners argue that the “IAT transponder may be assigned its ‘selected tag transmission interval’ during manufacture or by self-assignment,” as asserted by Petitioners. *See* Pet., 26 (citing EX1004, 27:14-21). That Harvey states different ways to assign a tag transmission interval is immaterial to whether the reference discloses “pre-determined intervals.” EX2001, ¶84. And Petitioners fail to explain how or why it does. Moreover, that disclosure provides no additional context or information related to the IAT transponder and the interval

itself, such as the type of information being transmitted or the period of time between intervals.

Petitioners string cite additional portions of Harvey in an attempt to show disclosure of “pre-determined intervals,” but these purported disclosures fail to describe transmission intervals, the transmission of encoded physiological data, or even the same embodiments in some instances. EX2001, ¶85. For example, Petitioners cite Harvey at 28:22-27, which describes a “predetermined transponder operation” mode. Pet., 26. The word “predetermined” in that context is describing the overall “operational mode” of XPDR 5000 itself, and it does not refer to the transmission interval or the transmitter. EX2001, ¶85. Nor are a transmitter or transmission mentioned at all in that citation. Petitioners also cite Harvey at 65:32-66:2, however that citation describes the transmission of a “REGISTRATION message,” and not the transmission of encoded physiological data. Pet., 26; EX2001, ¶85. Moreover, that citation relates to XPDR 7020, which is a different embodiment of transponder, separate from XPDR 5000 relied on by Petitioners elsewhere. EX1004, 65:32-66:2. As explained above, Petitioners’ reliance on separate embodiments is legally improper and cannot establish anticipation of the challenged claim elements as arranged in the claim. *See Net MoneyIN*, 545 F.3d at 1369-1371; *Microsoft*, 878 F.3d at 1069-1070.

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

C. Ground 2: Petitioners Fail to Show That Risky Anticipates Claims 5-6

As explained in Section III, the Board should exercise its discretion under § 325(d) to deny institution because Risky was already presented to the Office during prosecution of the '644 Patent, and the Examiner allowed the claims of the '644 Patent after expressly considering this reference. Petitioners never show that the Examiner erred in her evaluation of the Risky reference for anticipation—or identify a single material error at all—and have therefore failed to meet their burden under the Board's *Advanced Bionics* framework. But even if the Board does not deny the Petition based on that basis, Petitioners nonetheless fail to establish that Risky discloses all elements of claims 5-6 as arranged in the claims, and fail to explain how or why a POSA would have understood the elements to be inherent. EX2001, ¶¶87-92. As such, Petitioners do not demonstrate that Risky anticipates claims 5-6 and therefore cannot succeed on Ground 2.

Specifically, Petitioners fail 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]. For this element, Petitioners rely on two embodiments in Risky that discuss a transmission interval/frequency: (i) “burst” mode, and (ii) “on-line” mode. Pet., 36-37. Risky

provides no disclosures indicating that the transmission interval/frequency in either of these embodiments is pre-determined, and Petitioners do not argue that this element was inherent.

Riskey does not disclose activating the transmitter at “pre-determined intervals” when in “burst” mode. In discussing this embodiment, Risky states that “machine readable instructions 252 may specify a transmission interval, wherein processor 240 may transmit an animal characteristics message . . . at each transmission interval.” EX1005, [0049]. 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. EX2001, ¶89. Specifically, when Risky refers to “intervals” between events and the “frequency” of events, they are always conditional on the occurrence of other events that affect the transmission delay, and not pre-determined. *Id.* For example, Risky explains that machine-readable instructions 252 may define “conditions” under which processor 240 change sensor sampling frequency, polling frequency, or transmission frequency, e.g., based on a threshold animal temperature, health condition, or location. EX1004, [0048]; EX2001, ¶89. The processor may apply changes to “increase a polling and/or transmission frequency when the animal is in the vicinity of a calving pen and/or hospital pen” and “decrease the polling and/or transmission frequency when the animal is moved out of the pen.” EX1004,

[0048]; EX2001, ¶89. As such, the interval adapts to the varying conditions related to the animal, and it therefore cannot be pre-determined. *Id.*

Moreover, Risky only describes a system that transmits messages at intervals in response to different triggering events that can occur at any given time, not at pre-determined intervals. As discussed above, Risky purports to monitor animals by using a processor that adapts or varies the frequency of transmissions based on certain changes that occur, such as changes in the animal's health, location, or temperature. See Section II.C.1. Risky's goal in linking transmission frequencies to changes was to send messages relating to those changes as soon as possible after they occurred. EX2001, ¶90. For example, Risky explains that its processor may increase a transmission frequency in response to changes in the animal's location so that the animal manager is aware of that condition sooner. EX1005, [0048], [0142]; EX2001, ¶90.

Risky also does not disclose activating the transmitter at “pre-determined intervals” when in “on-line” mode. According to Petitioners, in Risky's “on-line” mode “the transmitter is activated at a predetermined ‘transmission frequency’—*i.e.*, transmission interval—specified by the device's machine readable instructions.” Pet., 37. But Petitioners completely overlook that “transmission” alone does not meet the claims. The relevant signal sent at pre-determined intervals must carry the animal's physiological data. EX2001, ¶91. That is not

how Risky's "on-line" mode operates. *Id.* In that mode, Risky's processor causes a communications unit, which comprises the transmitter, to transmit a "discovery message" (also referred to as a "ping") at a "set interval" to a base station or transceiver. EX1005, [0037], [0053]. The ping is a "simple message" including "unique identifiers associated with a particular bolus" and does not include "encoded physiological data" as required by the claim. *Id.*, [0053]. The bolus may be configured for "on-line" mode, and the transmitter in turn may be activated to transmit animal characteristics messages, only "[u]pon receipt of a reply message" from the base state or transceiver. *Id.* In other words, the transmitter is activated based on threshold conditions that must be met first, and it is not activated at a pre-determined interval of time. EX2001, ¶91. Accordingly, Risky does not disclose "activating" step under either embodiment asserted by Petitioners.

For at least the above reasons, Petitioners fail to establish a reasonable likelihood of prevailing on Ground 2.

D. Ground 3: Petitioners Fail to Show That Harvey in Combination with Risky Renders Obvious Claims 5-6

Ground 3 fails for several reasons. First, Petitioners engage in an improper obviousness analysis by arguing that each reference would provide any elements missing from the other, without specifying a primary reference, single missing element, or specific combination. Pet., 42. Second, even if Petitioners did put

forth a proper obviousness analysis, both Harvey and Risky fail to disclose the “pre-determined intervals” step in claim 5, and no combination of the two references would resolve that deficiency.

1. Ground 3 Is an Improper “Obviousness” Challenge

As a threshold matter, obviousness challenges—even when presented as an alternative to anticipation—must specify differences between the claims and the prior art and must articulate how and why a POSA would modify the prior art to meet the claims. *See, e.g., Apple Inc. v. OpenTV, Inc.*, IPR2015-01031, Paper 10, at 13 (P.T.A.B. Oct. 13, 2015) (“[I]n order to demonstrate obviousness, Petitioner must identify any differences between the claimed subject matter and the prior art.”); *Nanoco Techs., LTD., v. Mass. Inst. of Tech.*, 2015 WL 4572926, IPR2015-00532, at *22 (P.T.A.B. July 27, 2015) (“Challenging claims under an obviousness alternative to anticipation does not relieve Petitioner of the burden of articulating ‘reasoning with rational underpinning’ to show obviousness.” (citations omitted)). Petitioners have not done that here. Instead, Petitioners offer a general combination asserting that:

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. 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. This is nothing more than an improper catch-all argument based on obviousness, and it fails to satisfy the requirements of 35 U.S.C. § 103. *See KSR*, 550 U.S. at 418; *W.L. Gore*, 721 F.2d at 1552.

Nowhere do Petitioners identify a primary reference, the missing elements of that reference, or what teachings of the secondary reference should be applied. For example, while Petitioners' Ground 3 heading might suggest Harvey as a primary reference, they do not identify any specific element missing in Harvey, the teachings in Risky that should be combined with Harvey for such element, or how and why a POSA would have modified Harvey in view of Risky to achieve claims 5-6. EX2001, ¶94. Indeed, Petitioners never articulate a difference between the asserted art and the challenged claims, nor do they provide a reason to modify the references in combination with each other. *See* Pet., 38-42; EX2001, ¶95. The Board regularly rejects such obviousness challenges. *See, e.g., Apple Inc.*, IPR2015-01031, Paper 10, at 13 (determining that petitioner did "not identify with sufficient specificity what limitations are missing from Tomioka" where petitioner "suggest[ed] that various limitations . . . if found to be missing from Tomioka, may be taught or suggested by Tomioka itself, Schiller, or Kotani") (emphasis in original); *Johns Manville Corporation v. Knauf Insulation, Inc.*, IPR2015-01673,

Paper 7, at 14 (P.T.A.B. Jan. 4, 2016) (“Due to Petitioner’s failure to articulate a clear difference between the subject matter of the challenged claims and Swift, we decline to institute an IPR trial in this case.”); *SAP Am. Inc. v. Clouding IP, LLC*, IPR2014-00300 Paper 9 at 11–12 (P.T.A.B. July 9, 2014) (“Without having identified specifically the differences between the claimed invention and the prior art, Petitioner has failed to make a meaningful obviousness analysis under 35 U.S.C. § 103, and thus has failed to make a threshold showing of a reasonable likelihood that independent claim 1 is unpatentable.”).

2. Petitioners Do Not Identify a Reason to Combine Harvey and Risky

Petitioners do not identify any legally relevant reason why a POSA would have taken any disclosure from Risky and added it into Harvey’s system, or vice versa, rendering this ground meaningless. *Sisvel Int’l S.A. v. Sierra Wireless, Inc.*, 82 F.4th 1355, 1364 (Fed. Cir. 2023) (affirming Board’s finding of no motivation where “the 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”); EX2001, ¶¶96-97, 101. As discussed above regarding § 325(d), Risky was expressly considered by the Examiner during prosecution of the ’644 Patent, and Harvey is substantially the same art. See Section III.A.2.a. It is not enough that Risky and

Harvey are the same device used for the same purpose. Simply identifying the similarities between the references is not itself a reason to combine them. *See Sisvel*, 82 F.4th at 1364 (agreeing that petitioner’s “reasons to combine were merely assertions that the references were analogous art, which, without more, is an insufficient articulation for motivation to combine.”); *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1379 (Fed. Cir. 2016) (finding no “sufficient rationale for why a skilled artisan would have sought to combine the asserted prior art” where petitioner “attempted to provide the motivation to combine merely by noting surface similarities between the references”).

Indeed, Petitioners must articulate a specific reason to use parts of one reference with the other reference. *See Virtek Vision Int’l ULC v. Assembly Guidance Sys., Inc.*, 97 F.4th 882, 888 (Fed. Cir. 2024) (rejecting obviousness ground for failure to articulate “any reason to substitute one for another or any advantages that would flow from doing so”); *In re Magnum*, 829 F.3d at 1378 (“To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.”); *PersonalWeb Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 993-94 (Fed. Cir. 2017) (remanding where reasoning “say[s] no more than that a skilled artisan, once presented with the two references, would have understood that they *could be*

combined” as “that is not enough: it does not imply a motivation to pick out those two references and combine them to arrive at the claimed invention.”); *Intelligent Bio-Sys.*, 821 F.3d at 1367-68. But Petitioners never provide any specific reason to support combining any part of Risky into Harvey, or vice versa.

Not only does Petitioners’ obviousness analysis fail to articulate a reason to combine, it actually provides a reason why a POSA would *not* combine Harvey and Risky. According to Petitioners, both Harvey and Risky “came up with the same solution” to the “same problem.” Pet., 40-42. If that were true, a POSA would have no reason to combine the references because they do not teach anything new to each other. EX2001, ¶96. In other words, a POSA would not modify Harvey based on Risky to solve any problem because, as Petitioners contend, Harvey already solved the same problem as Risky and in the same way. *Id.* Likewise, a POSA would not turn to Harvey to modify Risky because, again, Harvey already purports to solve that same problem as Risky and in the same way. *Id.* In short, a POSA would have understood that each reference adds nothing new to the other reference and, therefore, would not have sought to combine them. EX2001, ¶97. Given the redundancy in Harvey and Risky’s purported solution to the same problem, there would have been no motivation for a POSA to modify either reference in view of the other. *See S.-Tek Sys., LLC v. Engineered Corrosion Sols., LLC*, 748 F. App’x 1003, 1006-07 (Fed. Cir. 2018)

(affirming Board’s finding that a POSA “would not have been motivated” to combine two references “given the redundant functions”); EX2001, ¶97.

3. Petitioners Fail to Show That the Purported Combination Meets All Elements of the Challenged Claims

In addition to failing to provide any reason to combine Harvey and Risky, Petitioners fail to show that any specific combination of the references discloses all of the claimed elements or renders them obvious. The only element specifically addressed in Ground 3 is the requirement that boluses be “orally administered,” but Petitioners never explain how the combination of Harvey and Risky somehow renders that requirement obvious. In any event, the alleged obviousness of “oral administration” does not address any of the deficiencies Patent Owner has identified in Harvey and Risky. EX2001, ¶98. As discussed above in Grounds 1 and 2, neither Risky nor Harvey discloses activating a radio signal generator at “pre-determined intervals” to carry “physiological data.” See Sections VI.B.3, VI.C. Accordingly, no combination of those references would address the deficiencies Patent Owner has identified, and nothing in Ground 3 suggests otherwise. EX2001, ¶99. Similarly, Petitioners do not make any argument that a POSA would have used the teachings in Risky to add a bolus or encoding functionality to Harvey’s ear tags to address the deficiencies Patent Owner identified in Section VI.B.1-2. Even under the most generous reading of Ground 3, Petitioners do not identify an obviousness combination *at all*. Accordingly,

Petitioners' Ground 3 adds nothing to Grounds 1 and 2 and cannot form a basis for institution. *See Edwards Lifesciences Corporation v. Aortic Innovations LLC*, IPR2023-01325, 2024 WL 741168, at *19 (P.T.A.B. Feb. 22, 2024) (rejecting obviousness ground and denying institution where "Petitioner's unspecified modifications leave important questions unanswered").

Even if the Board finds that the Petition identifies an actual combination of Harvey with Risky (which it does not), Petitioners nevertheless fail to explain *how* a POSA would have combined any teaching from Risky into Harvey's external ear tag, or vice versa. Nor do Petitioners explain why a POSA would have had as reasonable expectation of success in incorporating those teachings. Instead, Petitioners merely quote the standard form *KSR* without explaining how that standard is met. *See* Pet., 41; EX2001, ¶100. Neither Petitioners nor their expert provide any evidence or an adequate explanation to support why a POSA would have had reasonable success in modifying these references in view of each other, much less explain what the modification would have been. *See* Pet., 41; EX1002, ¶100; *PAR Pharm.*, 773 F.3d 1186 at 1193-94. This is insufficient for institution, as the reason to combine and reasonable expectation of success must be supported by evidence, not conclusory statements. *KSR*, 550 U.S. at 418; *In re Magnum Oil Tools*, 829 F.3d at 1378; *Intelligent Bio-Sys.*, 821 F.3d at 1367-68 ("It was [petitioner's] burden to demonstrate both 'that a skilled artisan would have been

motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.”).

Because Petitioners have not established that a combination of Harvey and Risky satisfies every element of the challenged claims and fail to engage in a proper obviousness analysis, the Board should decline institution based on Ground 3.

E. Ground 4: Petitioners Fail to Show That Harvey in view of Rettedal Renders Obvious Claim 7

Ground 4 fails for the same reasons as Ground 1. Claim 7 depends from claim 6, which depends from claim 5. EX1001, claims 5-7. As discussed for Ground 1, Harvey fails to disclose many of the elements recited in claim 5, including at least “one or more sensors contained in a bolus,” “encoding said sensor signal,” “encoded physiological data,” “a radio signal generator located within said bolus,” and “activating said radio signal generator at pre-determined intervals to generate a radio signal to carry said encoded physiological data.” See Section VI.B. Petitioners rely solely on Harvey for these elements in Ground 4, and they do not contend that Rettedal addresses Harvey’s deficiencies. See Pet., 47-49; EX2001, ¶¶102-103. Thus, Ground 4 necessarily falls with Ground 1, and the Board should decline to institute review based on this ground.

To the extent it is determined the Petition identifies an actual combination of the teachings in Harvey and Rettedal (which it does not), Petitioners nonetheless failed to explain how or why a POSA would have had a reasonable expectation of success in incorporating Rettedal's teachings into Harvey's tag. Similar to Ground 3, Petitioners make conclusory assertions that claim 7 includes "standard, predictable method steps using a bolus containing well-known, off-the-shelf sensors and radio communication components that would be familiar to any POSA," and that "the technology and operation of such components was well-understood in the relevant time period." Pet., 46-47. But Petitioners and their expert again provide no evidence or adequate explanation to support a reasonable expectation of success in modifying Harvey in view Rettedal. See Pet., 41; EX1002, ¶104; *PAR Pharm.*, 773 F.3d 1186 at 1193-94.

F. Ground 5: Petitioners Fail to Show That Harvey in view of Kunda Renders Obvious Claims 9-10

1. The Alleged Combination Fails to Disclose or Suggest the Invention of Claims 9-10

As a threshold matter, the combination of Harvey and Kunda cannot render claims 9-10 obvious because it lacks several key claim limitations. Petitioners rely on Kunda for its purported disclosure of "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," as recited

in element 9[G]. *See* Pet., 56-61. For every other claim element, Petitioners rely on Harvey. But as discussed in Ground 1, Harvey fails to disclose “one or more sensors contained in a bolus,” *see* Section VI.B.1, the “encoding” step and “encoded physiological data,” *see* Section VI.B.2, or “a radio signal generator located within said bolus” *see* Section VI.B.3. EX2001, ¶¶105-106. Petitioners do not allege that the combination of Harvey and Kunda somehow addresses these deficiencies. EX2001, ¶¶106-107. Accordingly, Ground 5 fails at the outset.

2. A POSA Would Not Have Had Reason to Combine Kunda with Harvey

a) Petitioners Again Mischaracterize Harvey’s Sparse Discussion of a “Bolus”

The Board may also deny institution under Ground 5 because Petitioners fail to explain how or why a POSA would have had reason to modify Harvey to incorporate Kunda’s antenna. Petitioners argue that a POSA would have been motivated to combine these references because “Kunda addresses the same size considerations” as Harvey, alleging that “Harvey sought to create a bolus that would fit within the digestive tract of a monitored animal” and had the “goal of providing a ‘miniature transponder.’” Pet., 50 (citing EX1004, 11:10-13, 18:15-17). Once again, Petitioners mischaracterize Harvey’s limited discussion of a bolus. *See* Section VI.B.1; EX2001, ¶109. Contrary to Petitioners’ assertion,

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. EX2001, ¶110.

Petitioners also fail to explain why a POSA would have interpreted any statement in Harvey to be directed to “bolus” size concerns. That is because Harvey never addresses such concerns, and instead focuses on ear tags affixed to the exterior of an animal’s body. *See, e.g.*, EX1004, 19:10-20:12, Figs. 1, 3A-3B; EX2001, ¶¶109-110. As an example, Petitioners cite Harvey at 18:15-17 for its disclosure of a “more compact form factor,” however that disclosure is specifically describing that “housing 2300 may have a more compact form factor.” *Id.*; *see* Section VI.B.1. Harvey’s only embodiment of housing 2300 is in Figure 2(c), which depicts the housing with “affixment fitting 2320,” as shown below:

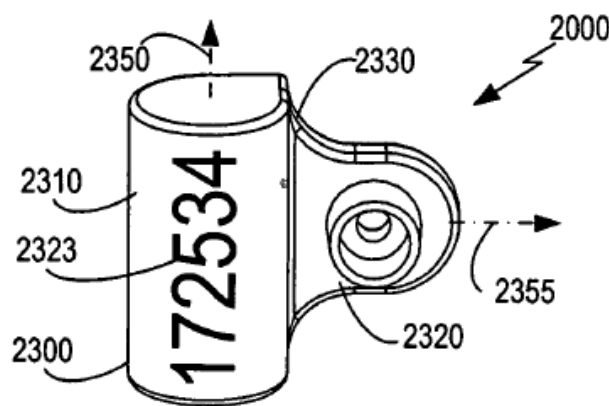


FIG. 2C

EX1004, Fig. 2C. A POSA would have understood this housing was for an exterior ear tag based on, for example, that affixment fitting 2320 is a pin hole, which would not make any sense in a bolus packaging. *Id.*; EX2001, ¶110. A POSA would have understood that fitting for “pinning” the ear tag to a cattle ear, as depicted in Figure 3A, for example. EX1004, 19:13-16, Figs. 3A; EX2001, ¶110.

b) A POSA Would Not Have Understood Kunda’s Antenna to be Capable of Use in a Bolus or Harvey

A POSA would have further understood that Kunda’s antenna is not an effective choice in a bolus. EX2001, ¶111. Petitioners contend that Kunda’s antenna addresses the same interference, bandwidth, and performance problems solved by the ’644 Patent. *See* Pet., 50-52; EX1001, 7:20-33. Kunda, however, does not describe an antenna capable of counteracting the unique electrical problems experienced when used in a bolus located *inside a body*. EX2001, ¶111. Specifically, Kunda discloses fitting a loop antenna to two integrated circuits, where impedance matching in the signal chain is critical to avoid antenna reflection and severe self-jamming to the radio-frequency integration circuits. *See* EX1007, [0024], Fig. 1 (baseband IC 52 and RFIC 54); EX2001, ¶111. Kunda describes a use case of a general communication integrated circuit with a transmitter and receiver, such as for use in mobile phones, where antenna reflection is the key design point. *See id.*; EX1007, [0001]-[0002]. But Kunda provides no disclosures suggesting that its antenna could be applied in a device used inside an

animal's reticulum, where, for example, impedance mismatching and antenna detuning are caused by internal factors, such as the properties of body tissue and complex food mixtures, resulting in significant performance loss, reduced battery life, attenuation, and polarization loss. EX2001, ¶111. A POSA would recognize those as necessary design focuses for an antenna in a bolus, and one that Kunda does not address. *Id.* A POSA would not be able to conclude from Kunda's disclosures that its antenna works in a bolus. *Id.* There would thus be no reason to combine Kunda with any of the alleged art.

A POSA also would have understood Kunda to disclose an antenna incapable of being included in Harvey's tag device. EX2001, ¶¶112-113. According to Petitioners, "because Kunda's double-loop antenna saves space," a POSA would consider it "well-suited for use in Harvey's cattle bolus." Pet., 50. While Kunda contemplates a small antenna, it does not disclose an antenna suitable for use in Harvey's device. EX2001, ¶112. As explained above, Kunda describes fitting a loop antenna to two integrated circuits and a limited use case of a general communication integrated circuit. *Id.* Petitioners and their expert fail to show that Harvey describes the same or a similar use case.

Nonetheless, a POSA 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. *See, e.g.,* Pet., 24, EX1004, 45:12-15 (antennas 5500 and 5501 for

RF module 5400 are “embedded in a printed circuit board” or “mounted on a substrate, which may be a printed circuit board”); EX2001, ¶113. 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.” EX1007, [0005]. In fact, 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.” EX1007, [0002]-[0003]; EX2001, ¶113. A POSA would have similarly understood helical antennas to be the better, smaller option for meeting size demands. *Id.* Even if space were a concern expressed in Harvey, there would have been no reason for a POSA at the time to use Kunda’s double-loop antenna over, for example, a helical antenna as a means to conserve space with a reasonable expectation of success. *Id.* Thus, in view of the references’ disclosures and the general knowledge in the field, a POSA would not have been motivated to combine Kunda with Harvey or had a reasonable expectation success in doing so. EX2001, ¶¶ 113-114.

G. Grounds 6 and 7 are Mooted by Patent Owner’s Statutory Disclaimer of Claim 13

Patent Owner has disclaimed claim 13 of the ’644 Patent (*see* EX2004), leaving claims 5-7, 9, and 10 as the remaining challenged claims. As a matter of law, claim 13 is therefore treated as if it never existed, rendering Grounds 6 and 7

moot. *See Genetics Inst., LLC v. Novartis Vaccines & Diagnostics, Inc.*, 655 F.3d 1291, 1299 (Fed. Cir. 2011) (“[U]pon entry of a disclaimer under § 253, we treat the patent as though the disclaimed claim(s) had never existed.” (citations omitted)). Accordingly, the Board may not institute an IPR based on Grounds 6 and 7. *See* 37 C.F.R. § 42.107(e) (“No *inter partes* review will be instituted based on disclaimed claims.”).

Patent Owner does not concede the merits of Petitioners’ challenges as to claim 13, and Patent Owner’s decision to disclaim claim 13 is not an admission of any kind regarding the grounds in the Petition. *See, e.g., Raytheon Techs. Corp. v. Gen. Elec. Co.*, 993 F.3d 1374, 1379 n.4 (Fed. Cir. 2021) (a “disclaimer does not legally constitute ‘an admission that the subject of the disclaimer appears in the prior art.’”). Disclaimer of claim 13 is merely to simplify proceedings. Because the Board may not institute an IPR based on a disclaimed claim, institution of this proceeding is appropriate only if Petitioners demonstrate a reasonable likelihood of prevailing on Grounds 1-5. As explained above, Petitioners failed to make such demonstrations for Grounds 1-5, and, therefore, the Board should deny institution.

VII. CONCLUSION

The Board should deny institution for the above reasons.

Dated: October 24, 2024

Respectfully submitted,

By: Daniel L. Moffett

Daniel L. Moffett

Registration No. 60,715

dmoффett@akingump.com

Megan Mahoney

Registration No. 80,921

mmahoney@akingump.com

Thomas W. Landers

Pro Hac Vice Motion to Be Filed

twlanders@akingump.com

AKIN GUMP STRAUSS HAUER &
FELD LLP

112 E. Pecan Street, Suite 1010

San Antonio, Texas 78205

Tel: 210-281-7100

Fax: 210-224-2035

Counsel for Patent Owner

ST Reproductive Technologies, LLC

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing ST Reproductive Technologies, LLC's Preliminary Response was served on counsel of record on October 24, 2024 by filing this document through the Patent Trial and Appeal Case Tracking System (P-TACTS), as well as delivering a copy via electronic mail to counsel of record for the Petitioners at the following addresses:

DECHERT LLP
Jeff Plies – jeff.plies@dechert.com
Michael Fisher – michael.fisher@dechert.com
smaXtec-IPRs@dechert.com

Dated: October 24, 2024

Respectfully submitted,

By: /Daniel L. Moffett/
Daniel L. Moffett
Registration No. 60,715
Counsel for Patent Owner

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 13,837 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).

Dated: October 24, 2024

Respectfully submitted,

By: /Daniel L. Moffett/
Daniel L. Moffett
Registration No. 60,715
Counsel for Patent Owner

APPENDIX A: CLAIM LISTING

Challenged claims 5-7, 9, and 10 are reproduced below with shorthand identifiers for each claim element listed in the left column.

Claim	Claim Language
5[Pre]	5. A method of monitoring physiological parameters of a ruminant animal, comprising:
5[A]	generating a sensor signal from one or more sensors contained in a bolus orally administered to said ruminant animal,
5[B]	said sensor signal varies based on a corresponding change in one or more physiological parameters of said ruminant animal;
5[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
5[D]	storing said encoded physiological data in a non-transitory computer readable media,
5[E]	enabling a radio signal generator located within said bolus;
5[F]	activating said radio signal generator at pre-determined intervals to generate a radio signal to carry said encoded physiological data; and
5[G]	generating said radio signal having a frequency of between about 700 MHz to about 1 GHz.
6	The method of claim 5, wherein said frequency is 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.
7	The method of claim 6, 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.
9[Pre]	9. A method of monitoring physiological parameters of a ruminant animal, comprising:
9[A]	generating a sensor signal from one or more sensors contained in a bolus orally administered to said ruminant animal,
9[B]	said sensor signal varies based on a corresponding change in one or more physiological parameters of said ruminant animal;
9[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;
9[D]	storing said encoded physiological data in a non-transitory computer readable media;
9[E]	enabling a radio signal generator located within said bolus;
9[F]	activating said radio signal generator to generate a radio signal to carry said encoded physiological data; and
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.
10	The method of claim 9, 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.