

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HUM INDUSTRIAL TECHNOLOGY, INC.

Petitioner

v.

AMSTED RAIL COMPANY, INC.

Patent Owner

Case IPR2023-00540

Patent No. 10,137,915

PATENT OWNER'S PRELIMINARY RESPONSE

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Ex #	Exhibit Description
2001	Expert Declaration of Dr. Michael Shamos (“Shamos Declaration”)
2002	<i>Curriculum Vitae</i> for Dr. Michael Shamos (“Shamos <i>Curriculum Vitae</i> ”)
2003	Joint Claim Construction Chart - Amsted Rail Company, Inc., v. Hum Industrial Technology, Inc., et al., Civil Action No. 4:22-cv-00445-AGF (E.D. Mo. March 31, 2023) (“District Court Claim Construction Chart”)
2004	U.S. Pat. Pub. No. 2009/0001226 to Haygood (“Haygood”)
2005	U.S. Pat. No. 7,336,156 to Arita et al. (“Arita”)

Patent Owner Amsted Rail Company, Inc. (“PO”) submits this Patent Owner Preliminary Response to the Petition for *Inter Partes* Review (“IPR”) challenging U.S. Patent No. 10,137,915 (“the ‘915 Patent”).

Pursuant to 35 U.S.C. § 314, the Director may not authorize an *inter partes* review to be instituted unless the Director determines that the information presented in the petition and any response shows there is a reasonable likelihood that the petitioner would prevail with respect to at least one of the claims challenged in the petition. Here, Petitioner has failed to establish any reasonable likelihood of prevailing on any claim of the ‘915 Patent.

I. INTRODUCTION

The Petition should not be instituted because of the following deficiencies:

Institution should be denied because the Petition is procedurally deficient for at least four reasons. First, institution should be denied under 35 U.S.C. § 325(d) because—for all proposed grounds—the same or substantially the same prior art and arguments were previously presented to the Office.

Second, Petitioner failed to comply with 37 C.F.R. §42.104(b)(3) and proffer, much less analyze the claim under, what it contends is the correct claim construction. Petitioner has offered claim constructions in District Court which conflict with its apparent positions on those claim terms in its Petition. Absent an explanation for

why Petitioner are justified in taking inconsistent positions in district court and this proceeding, denial of institution is warranted.

Third, much of Petitioner's expert declaration is nothing more than a verbatim recitation of the Petition without further explanation or additional citations to evidence and should therefore be afforded no weight. As such, the Petition amounts to little more than conclusory and unsupported attorney argument and denial of institution is warranted.

Fourth, Petitioner also fails to identify with particularity the grounds and supporting evidence for its challenge on a claim-by-claim basis, instead relying on bare cross-reference citations to claims which do not share the same scope or claim language. Petitioner's failure to explain how these claims should be similarly treaded to those with different language and scope renders the Petition deficient and denial of institution is warranted.

Institution should also be denied because the Petition is deficient on the merits. Grounds 1, 2, and 3 fail because LeFebvre does not disclose, teach, or suggest at least limitations 1(d), 30(c), or 36(d). Grounds 4, 5, and 6 fail because Armitage LeFebvre does not disclose, teach, or suggest at least limitations 1(d), 30(c), or 36(d).

II. THE PETITION IS PROCEDURALLY DEFICIENT AND SHOULD BE DENIED.

A. The Petition Should Be Denied Pursuant to the Board's Discretion Under §325(d).

Institution should be denied because the art and issues raised by the Petition are cumulative and substantially similar to the art and issues already addressed by the Office during prosecution. In determining whether discretionary denial is warranted, the Board evaluates (1) whether the same or substantially similar art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and (2) if either condition of the first part of the framework is satisfied, whether the Petition has demonstrated that the Office erred in a manner material to the patentability of the challenged claims. *Advanced Bionics, LLC v. Med-El Elektromedizinische Gerate GmbH*, IPR2019-01469, Paper 6 at 8-9 (PTAB Feb. 13, 2020) (precedential). If the first part of the framework is satisfied and the Petition fails to make a showing of material error, the Director generally will exercise discretion not to institute review. *Id.*

When evaluating whether to exercise its discretion when the same or substantially the same prior art or arguments were previously presented to the Office under §325(d), the Board weighs several non-exclusive factors, including, for example: (a) the similarities and material differences between the asserted art and the prior art involved during examination; (b) the cumulative nature of the asserted art and the prior art evaluated during examination; (c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection; (d) the extent of the overlap between the arguments made

during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art; (e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments. *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 at 17-18 (PTAB Dec. 15, 2017) (Precedential). “If, after review of factors (a), (b), and (d), it is determined that the same or substantially the same art or arguments previously were presented to the Office, then factors (c), (e), and (f) relate to whether the petitioner has demonstrated a material error by the Office.” *Advanced Bionics*, IPR2019-01469, Paper 6 at 10.

1. Petitioner Relies On the Same or Substantially the Same Prior Art Previously Presented to the USPTO (*Becton, Dickinson* Factors a, b, and d).

Contrary to Petitioner’s arguments, (Petition at 4, 15-17), the Examiner evaluated the same or substantially similar references to the asserted art in each of Petitioner’s six grounds. “Previously presented art includes ... art provided to the Office by an applicant, such as in an IDS.” *Palo Alto Networks, Inc. v. Centripetal Networks, Inc.*, IPR2021-01156, Paper. 10 at 13-14 (PTAB Jan. 24, 2022). The Board “accept[s] that the Examiner considered [the prior art references] listed on the IDS,” especially where “the Examiner signed the IDS with the statement ‘all references considered except where lined through.’” *Biocon Pharma Ltd. v. Novartis*

Pharms. Corp., IPR2020-01263, Paper 12 at 9 (PTAB Feb. 16, 2021). Petitioner is simply wrong to argue that “a reference cited in an IDS ... should not serve as the basis for denying institution under 35 U.S.C. §325(d).” (Pet. at 17.)

Petitioner relies on Armitage and/or LeFebvre as the primary references for all six grounds, (*see* Pet. at 6), on Barone as a secondary reference that purportedly also discloses the “filtering” limitation of the independent claims, (*see, e.g., id.* at 21, 27-28), and on Winfree for dependent claim limitations, (Pet. at 6). Petitioner concedes the Examiner considered LeFebvre, (*see* §II.A.2, *infra*), but incorrectly states that Armitage was not considered by the Examiner and that neither Barone or Winfree are substantially similar to art considered by the Examiner. (*See* Pet. at 16-17.)

In addition to LeFebvre¹, Patent Owner cited and the Examiner considered Armitage during prosecution. Specifically, Patent Owner filed an Information Disclosure Statement (IDS) citing **both** references. (Ex. 1002 at 211-216 (citing LeFebvre at 212 and Armitage at 213); *see also id.* at 94-96 (informing LeFebvre was “of particular relevance”).) The Examiner confirmed their consideration of

¹ The IDS notice identified U.S. Patent No. 7,688,218 to LeFebvre, which is the patent that issued from the cited LeFebvre publication (U.S. Pat. Pub. No. 2007/0152107) relied upon by Petitioner.

LeFebvre and Armitage by signing and dating the IDS on October 27, 2017. (Ex. 1002 at 487-91 (confirming consideration of LeFebvre at 488 and Armitage at 489).) In addition, at the bottom of each page, the Examiner included text stating, “ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /JCS/.” (See *id.* at 488-89 (confirming consideration of both references).) Neither reference was lined through. (*Id.*) The Examiner even used both references to locate relevant prior art. (See *id.* at 556, 640.) Further, in its first rejection, the Examiner provided a Notice of References Cited that included both Armitage and LeFebvre. (Ex. 1002 at 519.)

Petitioner, however, does not explain how Armitage’s disclosures meaningfully differ from LeFebvre or any other considered art, if at all, nor argue that the Examiner erred in considering Armitage. (See *generally* Pet.) In fact, Petitioner claims that Armitage and LeFebvre both disclose every limitation of the ‘915 Patent’s independent claims. (See Pet. at 21-33 (arguing Armitage discloses every limitation of claim 1), 38-40 (same as to claims 30 and 36), 51-61 (arguing LeFebvre discloses every limitation of claim 1), 66-67 (same as to claims 30 and 36).) That is, Petitioner tacitly admits that Armitage adds nothing new.

Likewise, Petitioner’s conclusory statement that “Barone and Winfree, and arguments presented herein, are not the same or substantially similar to those considered by the Examiner,” (Pet. at 16), does not explain how the teachings of the

asserted art differ from or are not cumulative of other art considered by the Examiner.² See *EcoFasten Solar, LLC v. Unirac, Inc.*, IPR2021-01379, Paper 11 at 38-39 (PTAB Feb. 8, 2022) (“the issue of § 325(d) is *not* limited to whether the Examiner ‘considered’ a reference or grounds during the original prosecution leading to issuance of the [] patent, but whether the same or *substantially the same* prior art or arguments ‘*previously were presented to the Office*’”) (emphasis in original). Here, Petitioner ignores that other references considered by the Examiner have similar disclosures to those Petitioner now claims are material, i.e., the use of accelerometer sensors and filters to filter at least a portion of the acceleration. (See Ex. 1002 at 360 (application to Negoro disclosing accelerometers used to measure vibration); at 450 (application to Searle disclosing accelerometers to measure vibration that have outputs that are “low-pass filtered” and compared against an alarm level); at 601 (JP2009210301 disclosing a low pass filter for attenuating a frequency component of the output). Petitioner’s failure to address these references or explain why they are not cumulative warrants denial of institution. *Nespresso USA, Inc. v. K-Fee System GmbH*, IPR2021-01222, Paper 9 at 13-14 (PTAB Jan.

² Even assuming *arguendo* that Armitage was not considered, Petitioner’s complete failure to address how its teachings differ from or are not cumulative of other considered art, (*see* Pet. at 17), fail for the same reasons discussed herein.

18,2022) (denying institution because asserted was cumulative of reference considered during prosecution because petitioner relied on references for similar purposes).

Further, Petitioner's reliance on Barone and or Winfree for dependent claims, (Pet. at 16), is immaterial to this analysis. A petitions' citation of references not considered by the Examiner only for "additional subject matter of certain dependent claims[] is insufficient to persuade us that exercising our discretion under 35 U.S.C. §325(d) is inappropriate." *Kayak Software Corp. v. Int'l Bus. Machs. Corp.*, Case CBM2016-00075, Paper No. 16 at 10 (PTAB Dec. 15, 2016) (designated informative; declining to institute review); *see also Miltenyi Biomed, GmbH v. Trs. Of Univ. of Pa.*, IPR2022-00853, Paper No. 11 at 45 (PTAB Oct. 11, 2022) (denying institution because purportedly invalidating art was cited or similar to art cited in IDS and/or used dependent claim limitations insufficient).) Here, Petitioner's Grounds 2-3 and 5-6 are only directed to dependent claims.

Because Armitage was expressly considered by the Examiner and the asserted references are cumulative or immaterial to the analysis, Petitioner's failure to adequately address prong one warrants denial for at least Grounds 1-3. *See Microsoft Corp. v. Koninklijke Philips N.V.*, IPR2018-00279, Paper 11 at 12, 14-15 (PTAB June 8, 2018) (finding, under similar facts, the reference "was previously presented to, and considered by, the Office"); *Fellowes, Inc. v. Treefrog Devs., Inc.*, IPR2020-

01509, Paper 11 at 7-8, 17 (PTAB Feb. 22, 2021) (denying institution under § 325(d) where reference was cited in IDS and listed on the face of the patent); *Ocado Grp. PLC v. Autostore Tech. AS*, IPR2021-00412, Paper 9 at 34-35 (PTAB July 21, 2021) (denying institution because reference listed in IDS “was previously before the Office”); *Eyenovia, Inc. v. Sydnexis*, IPR2022- 00963, Paper 7 at 10-11 (PTAB Nov. 8, 2022) (denying institution because references listed in IDS were “previously presented” under § 325(d); *BMW of N. Am., LLC v. Stragent, LLC*, IPR2021-00419, Paper No. 14 at 12-13 (PTAB July 19, 2021) (denying institution under § 325(d) in part because relied-upon prior art was cited on an IDS), *reh’g denied*, Paper No. 21 at 5 (PTAB Mar. 21, 2022).).

**2. Petitioner Has Made No Showing of Material Error
(*Becton, Dickinson* Factors c, e, and f).**

Upon satisfaction of the first prong, the Board requires “a showing that the Office erred in evaluating the art.” *Advanced Bionics*, IPR2019-01469, Paper 6 at 8. As discussed *supra*, the Examiner was fully aware of both LeFebvre and Armitage and of art substantially similar to or cumulative of the references asserted by Petitioner. *See* §II.A.1, *supra*. Petitioner only claims, however, that the Examiner erred in his consideration of LeFebvre. *See* Pet. at 17-19. This argument lacks merit.

Contrary to Petitioner’s suggestions, the Examiner did not fail to apply LeFebvre to newly added limitations. *See* Pet. at 18-19. Patent Owner presented

claims having limitations that included “a sensor to measure accelerations” and a filter to “isolate” or “filter out undesirable accelerations” *See, e.g.*, Ex. 1002 at 76-78 (presenting at least claims 50-51, 53, 55, 57, 59 that include such limitations on June 24, 2016). The Examiner scrutinized LeFebvre and, for over 20 pages, compared its disclosures to the asserted claims but did not find that LeFebvre disclosed the claimed filtering limitations. *Id.* at 496-518. For example, claim 53 claimed “filters used to isolate certain types of accelerations,” (*id.* at 76), which the Examiner found to be allowable subject matter prior to any amendment, (*id.* at 517).

Petitioner’s unsupported claim that a search for Barone would have led to a rejection, (Pet. at 18-19), also fails. As described *infra* § V(B)(1), Barone describes a system that preprocesses or conditions a signal before a signal is measured but does not disclose filtering a portion of the acceleration data or signal that is measured. *See* §VI.A.1.b, *infra* (incorporated here); Ex. 1007 at ¶¶35-59. Other art disclosed the same. *See, e.g.*, Ex. 2004 at ¶¶26, 32 (disclosing conditioning of analog accelerometer output on railcar prior to the analog-to-digital conversion and subsequent accelerometer signal processing steps); Ex. 2005 at 5:39-45 (describing collecting of “data output” from accelerometers), 7:30-65 (describing passing output through band pass prior to converting to digital signal for processing), 8:41-47 (stating filter removes outer bands of data prior to amplification and then digitization). The Examiner considered this substantially similar art, *see* Ex. 1002 at

¶519, and did not reject the claims. That is, contrary to Petitioner’s claims, the Examiner *did* consider LeFebvre with “another reference expressly disclosing the filtering limitations,” Pet. at 19, and thus no error has been shown.

Accordingly, exercise of discretion under §325(d) is warranted and the Board should deny institution.

B. Petitioner Fails to Propose a Construction It Believes Is Correct.

In addition to the reasons set forth above (*see* §II.A, *supra*), the Petition should be denied because Petitioner fails to proffer, much less analyze the claim under, what it contends is the correct claim construction. Rule 104 requires that “the petition must set forth... [h]ow the challenged claim is to be construed.” 37 C.F.R. § 42.104(b)(3). As the Board has previously explained, “[t]he ‘construction’ referred to by 37 C.F.R. § 42.104(b)(3) is the construction proposed by the Petitioner, *one that Petitioner believes is the correct construction* under applicable law and should apply in the involved proceeding.” *Toyota Motor Corp. v. Blitzsafe Texas, LLC*, IPR2016-00422, Paper 12 at 26 (PTAB July 6, 2016) (emphasis added). Further, the 2018 change to claim construction standards in PTAB proceedings was meant to “prevent[] parties from taking inconsistent positions, such as a patent challenger arguing for a broad scope in a PTAB proceeding [] and a narrow scope [] in district court to avoid a finding of infringement.” 83 FED. REG. 51,342-51,343; 51,345 (Oct. 11, 2018) (further stating “the possibility of differing constructions for the

same claim term is troubling, especially when claim construction takes place at the same time in parallel district court proceedings and USPTO proceedings”).

When a petitioner presents one construction in district court and another to the PTAB, “the subsequent decisions issued in reliance on these inconsistent claim constructions may lack ‘uniformity’” and “may undermine the ‘predictability’ of the... patent’s claim scope and the ‘integrity of the patent system’ overall. *KioSoft Tech. LLC v. PayRange Inc.*, CBM2020-00026, Paper 11 at 17 (PTAB Mar. 22, 2021). The “potential problems inherent in [Petitioner’s] inconsistent claim constructions” favors a denial of institution under 35 U.S.C. § 324(a), “regardless of the Petition’s merits.” *Id.* at 17-18.

Here, Petitioner states there are “no formal claim construction necessary in this proceeding,” (Pet. at 15-16), but this is inconsistent with positions Petitioner has taken in the on-going district court litigation. Specifically, Petitioner proposed the following constructions of terms in the ‘915 Patent along with citations to both intrinsic and extrinsic evidence in support thereof:

Claim Term	Petitioner’s Proposed Construction in District Court
“communication management unit”	“a device capable of receiving data and/or alarms from one or more motes (e.g., sensor units) and capable of transmitting data and alarm information to a remote receiver”
“software filters” or “software filters	“a software program executed by a processor programmed to decrease noise from unwanted

configured to isolate one or more types of accelerations”	acceleration frequencies and increase signals from acceleration frequencies of interest”
“one or more mechanical filters that include a resilient material configured to filter out undesirable accelerations”	“a filter made of resilient material designed for the purpose of filtering high and low frequencies from the signal of interest”

(See Ex. 2003 at 3-10, 23-26.) Petitioner tacitly admits these constructions are not the plain and ordinary meanings because, unlike with any of these terms, Petitioner took that position with other terms. (See, e.g., *id.* at 26 (stating “digital filters” should be given its plain and ordinary meaning and “no construction [was] needed”).) Petitioner’s avoidance of an actual position on the construction of these terms was almost certainly an intentional effort to use a broad construction for validity purposes and a narrow one for infringement purposes. Such gamesmanship is improper.

Because Petitioner did not provide “any arguments as to why [inconsistency] problems are not presented here, much less provided any reason behind its inconsistent claim constructions in general” dismissal is warranted. *KioSoft, CBM2020-00026*, Paper 11 at 17-18 (denying institution); *see also Orthopediatrics Corp. v. K2M Inc.*, IPR2018-01546, Paper 10, 10-12 (P.T.A.B. Feb. 14, 2019) (denying institution where petitioner failed to provide claim construction, which was inconsistent with position in district court); *Samsung Elecs. Co., Ltd. v. Ancora*

Techs., Inc., IPR2020-01184, Paper 11, 27 (P.T.A.B. Jan. 5, 2021) (denying institution where petitioner had inconsistent claim construction positions).

C. The Petition is Unsupported Attorney Argument.

Expert declarations that “merely repeats, verbatim, the conclusory assertion for which it is offered to support” without citation to “any additional supporting evidence [or] technical reasoning to support [the] statements” amount to “conclusory and supported” testimony that “adds little to the conclusory assertion for which it is offered to support, and is entitled to little weight.” *Xerox Corp., et al. v. Bytemark, Inc.*, IPR2022-00624 Paper 9 at 15 (PTAB Aug. 24, 2022) (Precedential); *see also Samsung Elec. Co. Ltd. et al. v. Rightquestion, LLC*, IPR2022-00251, Paper 17 at 25 (PTAB June 9, 2022) (denying institution and holding expert declaration that “makes same statements verbatim, without more, and with no further explanation or additional citations to evidence” is “conclusory, unsupported assertions” that should be afforded “little or no weight”).

Here, the expert testimony of Steven Ricca (Ex. 1003) is nothing more than a verbatim recitation of the arguments and evidence cited in the Petition. (*Compare generally* Pet. *with* Ex. 1003.) By way of non-limiting examples, the following demonstrate that Ricca’s testimony is—other than minor additions, which have been underlined—simply a mirror image of attorney argument in the petition:

<u>Petition at 26:</u> Additionally, Armitage discloses filtering at the sensor level. EX1003, ¶77. Armitage’s “sensor 630” can include “amplifiers, analog-to-digital-converters, [and] microcontrollers.” EX1006, ¶[0056]. A PHOSITA would understand Armitage’s teachings of amplifiers, analog-to-digital-converters, and microcontrollers in the sensor would mean the sensor is capable of filtering at least a portion of accelerations. EX1003, ¶77.	<u>Ex. 1003 at ¶77:</u> Additionally, Armitage discloses filtering at the sensor level. Armitage’s “sensor 630” can include “amplifiers, analog-to-digital-converters, [and] microcontrollers.” EX1006, ¶[0056]. <u>In my opinion</u>, a PHOSITA would understand Armitage’s teachings of amplifiers, analog-to-digital-converters, and microcontrollers in the sensor would mean the sensor is capable of filtering at least a portion of accelerations.
<u>Petition at 29:</u> Because Barone explicitly discloses filtering data, a PHOSITA would have been motivated to include the filtering taught by Barone with Armitage	<u>Exhibit 1003 at ¶82:</u> <u>It is my opinion that...</u> because Barone explicitly discloses filtering data, a PHOSITA would have been motivated to include the filtering taught by Barone with Armitage

because the advantage of filtering is to remove unwanted data and/or amplify particularly relevant data, and the purpose of both the Armitage and Barone systems is to analyze data in a train monitoring system to accurately predict anomalous conditions and avoid false or inaccurate data processing. EX1003, ¶82; <i>KSR</i>, 550 U.S. at 416. Combining the sampling of data (i.e., filtering) in Armitage and the electronic and digital filtering taught in Barone would have predictably resulted in the filtering of accelerations data. EX1003, ¶82.	because the advantage of filtering is to remove unwanted data and/or amplify particularly relevant data, and the purpose of both the Armitage and Barone systems is to analyze data in a train monitoring system to accurately predict anomalous conditions and avoid false or inaccurate data processing. <i>KSR</i>, 550 U.S. at 416. Combining the sampling of data (i.e., filtering) in Armitage and the electronic and digital filtering taught in Barone would have predictably resulted in the filtering of accelerations data.
<u>Petition at 50-51:</u> Barone explicitly discloses filtering data, and a PHOSITA would have been motivated to include the filter taught by	<u>Ex. 1003 at ¶146:</u> Barone explicitly discloses filtering data, and a PHOSITA would have been motivated to include the filter taught by

Barone with LeFebvre because the advantage of filtering is to remove unwanted data and/or amplify particularly relevant data, and the purpose of both systems is to analyze data in a train monitoring system to accurately predict anomalous conditions and avoid false or inaccurate data processing. EX1003, ¶146; <i>KSR</i>, 550 U.S. at 416. Combining the preliminary analysis and sampling of data in LeFebvre using an electronic filter and the filter taught in Barone would have predictably resulted in the electronic or digital filtering of accelerations data. EX1003, ¶146.	Barone with LeFebvre because the advantage of filtering is to remove unwanted data and/or amplify particularly relevant data, and the purpose of both systems is to analyze data in a train monitoring system to accurately predict anomalous conditions and avoid false or inaccurate data processing. <i>KSR International Co. v. Teleflex Inc.</i>, 550 U.S. 398, 416 (2007). Combining the preliminary analysis and sampling of data in LeFebvre using an electronic filter and the filter taught in Barone would have predictably resulted in the electronic or digital filtering of accelerations data.
<u>Petition at 54-55:</u> Second, LeFebvre teaches the microprocessors within the	<u>Ex. 1003 at ¶157:</u> Second, LeFebvre teaches the microprocessors within the

instrumented pads and the “data control unit 23” serve the important functions of processing and filtering the raw data to only send “essential indicative information.” EX1003, ¶157; EX1005, ¶[0053]. A PHOSITA would understand LeFebvre’s processing of data to identify and send essential indicative information equates to filtering at least a portion of accelerations. EX1003, ¶157.	instrumented pads and the “data control unit 23” serve the important functions of processing and filtering the raw data so to only send “essential indicative information.” EX1005, ¶[0053]. A PHOSITA would understand LeFebvre’s processing of data in order to identify and send essential indicative information equates to filtering at least a portion of accelerations.
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This mirror imaging of attorney argument plagues Mr. Ricca’s declarations. *Compare* Pet. at 22-33 (Petitioner’s argument as to Claim 1) *with* Ex. 1003 at ¶¶70-90 (parroting nearly verbatim argument for Claim 1, including same quotations, emphasis, cited evidence, parentheticals, etc.); *compare* Petition at 34 (arguments as to other challenged claims in Ground 1) *with* Ex. 1003 at ¶¶91-134 (parroting same); *compare* Petition at 44-45 (Ground 2 arguments) *with* Ex. 1003 at ¶¶135-137 (parroting same); Petition at 45-49 (Ground 3 arguments) *with* Ex. 1003 at ¶¶138-144 (parroting same); Petition at 49-72 (Ground 4 arguments) *with* Ex. 1003 at

¶¶145-203 (parroting same); Petition at 72-77 (Ground 5 arguments) with Ex. 1003 at ¶¶204-224 (parroting same); Petition at 78-80 (Ground 6 arguments) with Ex. 1003 at ¶¶225-231 (parroting same). That is, the declaration of Steven Ricca is nothing but a verbatim recitation of the Petition without further explanation or additional citations to evidence and should therefore be afforded no weight.

Accordingly, the Petition is nothing but conclusory and unsupported attorney argument and institution should be denied.

D. The Petition’s Claim-by-Claim Analysis Includes Impermissible Cross-Referencing.

Petitioner fails to identify with particularity the grounds and supporting evidence for its challenge on a claim-by-claim basis. Indeed, Petitioner provides analysis of claims 26, 27, 28, 29, 30, and 36 that consists entirely of internal cross-references to its prior analysis of other, different claims with different claim language or limitations. (*See* Pet. at 38-40, 49, 66-68, 73-75, 80.) Petitioner’s failure to provide analysis, e.g., explaining how the asserted art and prior analysis renders obvious different claims, is improper. *See, e.g., DIRECTV, LLC v. Qurio Holdings, Inc.*, IPR2015-02007, Paper 6 at 9 (PTAB Apr. 4, 2016) (denying institution where “[p]etition’s analysis of [cited] elements features internal cross-references to its discussion of other elements, with minimal—and often no—additional discussion specifically directed to the language of these claim elements”); *Apple Inc. v.*

ContentGuard Holdings, Inc., IPR2015-00449, Paper 10 at 6 (July 15, 2015) (rejecting obviousness analysis as “two or three levels removed from the actual disclosures of [the prior art]” where argument relied upon cross-references to other sections of petition).

For example, the Petition’s analyses of Claim 30—a method claim—simply redirects to the analysis performed for Claim 1—a system claim having different language—without any additional argument or analysis. (*See* Pet. at 38-39, 66-67; *see also* Pet. at p. x-xiii (claim listing).) Claim 36—a system claim with different language than Claim 1—likewise simply redirects to the analysis of Claim 1 without any additional argument or analysis. (*See* Pet. at 39-40, 67.) None of these cites to prior analysis explain the differences in claim language. (*See* Pet. at 38-40, 49, 66-68, 73-75, 80 (challenging claims without analysis).) Petitioner’s failure to address the actual claim language, and thus, failure to meet its burden warrants denial of institution.

III. OVERVIEW OF THE ’915 PATENT

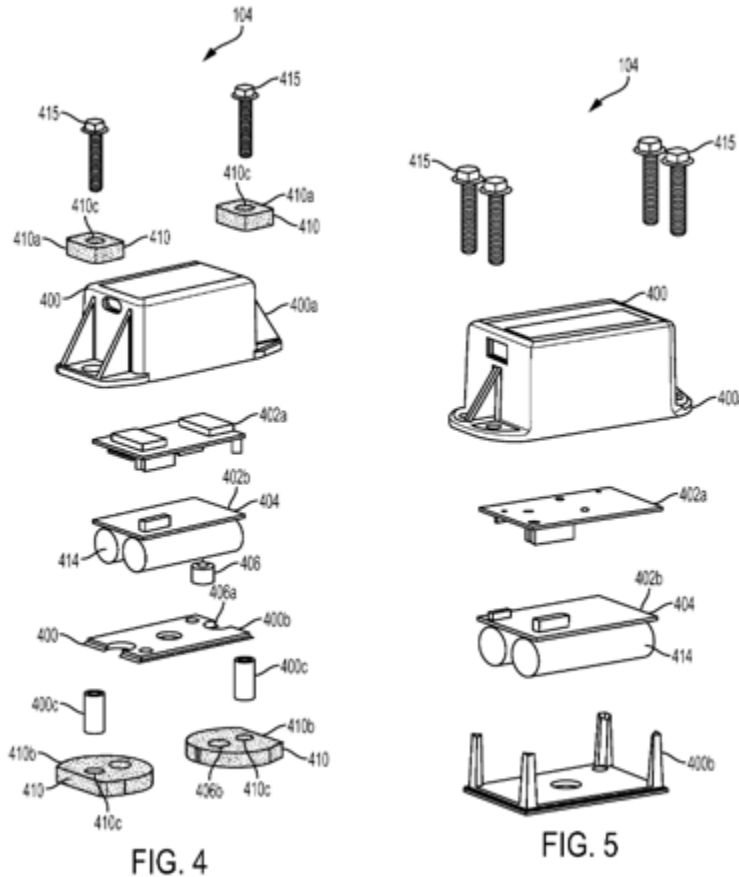
The ’915 patent relates to a system and method for detecting operational anomalies in train consists and railcars, e.g., the monitoring of bearings and wheel to rail interactions. *See* Ex. 1001 at 1:1-4; 9:14-16. The ’915 patent teaches a POSA how to arrange various electronic sensor components and communication devices train wide according to a hierarchical arrangement utilizing advanced distributed

data analysis techniques. *Id.* at 1:59-65. For example, the '915 discloses a system capable of detecting operational anomalies independently at various levels of the hierarchy and optimizes the flow of electronic sensor data and information between various components. *Id.* at 9:36-46, 17:9-20. At the lowest level of a single railcar, a sensor node having an accelerometer may be configured to measure accelerations of a railcar and then pass on that accelerations data to a communication management unit associated with that railcar. *Id.* at 1:66-2:25. The communication management unit may consolidate sensor data from a plurality of sensor nodes associated with that railcar and apply logic to that sensor data to generate warning alerts for that railcar. *Id.* at 3:38-4:15. In turn, the communication management unit may communicate sensor data and results of any analysis to operators of a locomotive and/or offsite to a remote location for further analysis and reporting. *Id.* In addition to a communication management unit, a powered wireless gateway may be provided to analyze and determine train wide issues such as hunting by consolidating and analyzing sensor data and information from a plurality of communication management units. *Id.* at 14:16-41.

In preferred embodiments, a sensor node may be tuned to detect and report certain kinds of accelerations of interest and to not report other kinds of accelerations that are not of interest. *Id.* at 4:64-5:2. In other words, the '915 patent teaches a POSA of the importance in amplifying certain frequencies of interest, isolating

certain frequencies of interest, and removing other frequencies of non-interest to make appropriate and accurate determinations about the operating conditions of the various components of the railcar. *Id.* at 5:23-42.

A sensor node may be positioned adjacent a wheel bearing fitting although there is wide variability in specific location of each sensor node. Various electronic components of the sensor node may be disposed in a housing similarly as shown below in FIGS. 4 and 5. *Id.* at 4:64-5:23, FIGS. 4-5. After the various components are disposed in the housing, the housing may be filled with a potting material and mounted to the side of a railcar with a mechanical filter making direct contact between the sensor node and the railcar. *Id.* The '915 patent teaches that to effectively tune the sensor node it is critical to coordinate the relative hardness of a mechanical filter and potting material such that they each fall within a specific range of the durometer shore hardness scale. *Id.* That is to say that the '915 patent teaches a POSA of the cooperative effect these material choices have on the ability of an accelerometer to detect the accelerations of the railcar versus other vibrations experienced by the accelerometer that are not of interest. *Id.* For example, these material choices may filter out undesirable accelerations before they reach the accelerometer such that the accelerometer may provide a higher quality and/or more relevant signal to the communications management unit. *Id.*



The '915 patent greatly improved over prior art systems by monitoring the railcar's accelerations data and by filtering of that data to detect different types of conditions from multiple types of sensor nodes in multiple different locations. *Id.* at 1:13-55. The '915 patent explains that different types of sensors, compare FIG. 4 o FIG. 5 above, are best suited for disposal in different locations of the railcar and that each type of sensor may include firmware having different types of programming to detect different types of acceleration events. *Id.* at 6:28-7:15. Example acceleration events may include wheel derailment, wheel damage, longitudinal impact, extreme

lateral railcar dynamics, extreme vertical railcar dynamics, vertical hunting and lateral hunting. *Id.* at 8:17-64.

Each of these types of events may require specially programmed software to perform the filtering of accelerations data once that data has entered the digital domain. *Id.* at 6:28-7:15. For example, once accelerations data has been collected from individual sensor nodes the communications management unit may correlate various accelerations data to make a determination of an event. *Id.* at 9:8-16:54: FIGS. 2-3,7-14. Additionally, the accelerations data may be analyzed by a microprocessor having specifically configured software to detect the specific conditions, issues, and risks posed to a railcar. *Id.* at 6:28-7:15. In one implementation, the '915 patent teaches a POSA that the accelerations data may be filtered and then portions thereof may be selected for analysis by a feature detector. *Id.* at 5:33-42, 13:11-14:9. Selection of data can be based on any number of things, such as direction, frequency, overall magnitude, and combinations thereof. *Id.* The feature detector may then analyze the filtered data to determine if various features indicative of a particular type of condition are present. *Id.* Example features identified by the feature detector may include pulse peaks or duration, root mean square (RMS) level of magnitude values, or presence or lack of specific frequency components. *Id.* at 8:32-47, 13:25-14:22. This type of distributed analysis system in which accelerations data may be filtered and analyzed in the digital domain greatly

improved over prior art systems that merely performed basic signal preconditioning and signal sampling before any such accelerations data was in the digital domain. *Id.* 1:13-2:25.

With reference to FIG. 12 (below), an individual sensor node may include a three-dimensional accelerometer 404 that may provide three types of accelerations data output in the longitudinal, vertical, and lateral directions. *Id.* 13:11-14:9, *see also* FIGS. 12-14. Each of the different types of accelerations data output may be filtered appropriately based on its relative orientation by a corresponding digital filter 1204 in the digital domain. *Id.* Thereafter, each respective filtered signal may be further analyzed by a corresponding feature detector 1212 to form various inferences regarding event conditions of the railcar and train. *Id.* The raw data and/or the analysis thereof may be passed on to the CMU which then compiles all of the relevant data and analysis to make a coordinated determination of an event of the railcar. *Id.* at 8:31-14:22.

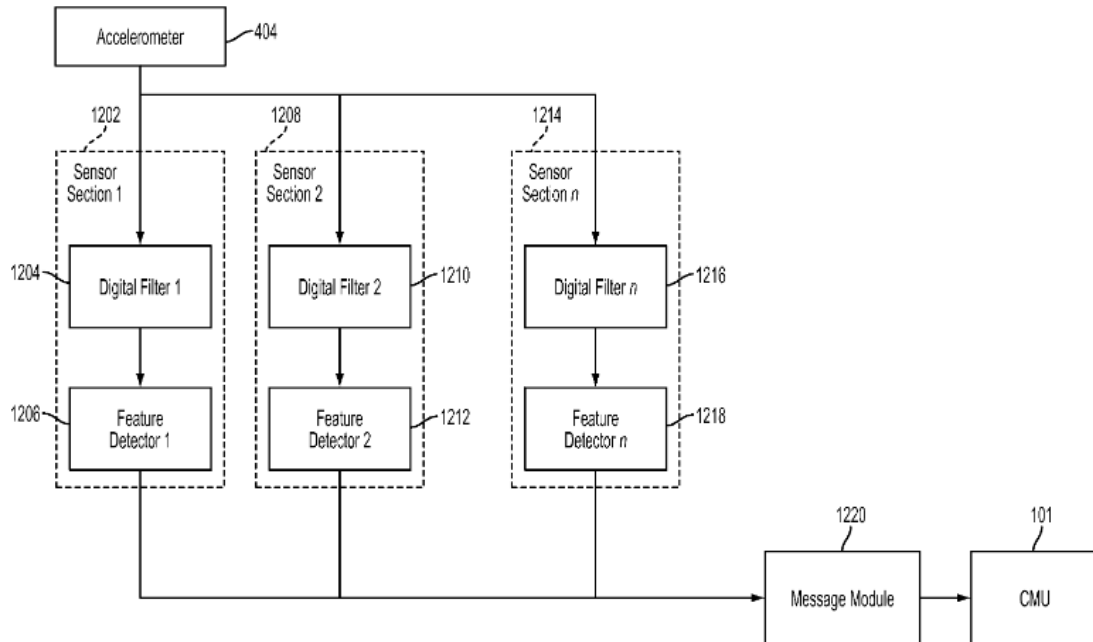


FIG. 12

IV. LEVEL OF ORDINARY SKILL IN THE ART

A person of ordinary skill in the art (“POSA”) is a person with at least a B.S. degree in electrical engineering, in computer science, or in a related field with at least two years’ experience analyzing, designing, and/or building sensor and monitoring systems for railcars or similar industrial equipment and who has a familiarity with wireless networks. *See* Ex. 2001 at ¶¶34-39. Less work experience could be compensated by a higher level of education, such as a master’s degree or doctorate degree, and vice versa. *Id.* at ¶39.

V. CLAIM CONSTRUCTION

Claims are to be construed “in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art.” 37 C.F.R.

§42.100(b); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc). Ordinary and customary meaning is determined “in the context of the entire patent, including the specification” and prosecution history. *Phillips*, 415 F.3d at 1313. Extrinsic evidence may also be useful in construing claim terms under the *Phillips* standard but “should be considered in the context of the intrinsic evidence.” *HubSpot, Inc. v. Trident Holdings, Inc.*, IPR2022-00907, Paper 6 at 8 (PTAB Oct. 27, 2022) (citing *Phillips*, 415 F.3d at 1317-19). For purposes of its preliminary response only, Patent Owner gives each term its plain and ordinary meaning, but reserves all rights.³

VI. THE PETITION LACKS MERIT AND THUS INSTITUTION SHOULD BE DENIED.

Petitioner has failed to show a reasonable likelihood of prevailing on any ground specifically challenging any Claim of the ‘915 Patent.

A. Petitioner’s Ground One Fails to Show Any Claim is Invalid.

Petitioner has failed to show a reasonable likelihood that any claim—including Claims 1, 22, 24-25, 27-30, 36, or 37—are unpatentable under 35 U.S.C. § 103(a) as obvious over Armitage in view of Barone.

³ Patent Owner specifically reserves its right to assert additional arguments about the proper construction and scope of all terms if an IPR is instituted.

1. Claim 1

Armitage in view of Barone fails to disclose, teach, or suggest every limitation of claim 1. *See* Ex. 2001 at ¶¶41-61. Independent claim 1 requires that “one or more filters [are] configured to filter at least a portion of the accelerations,” which are measured by a sensor. *See* Ex. 1001 at 17:48-18:2. However, the references—alone or in combination—fail to disclose or suggest at least limitation 1(d). Ex. 2001 at ¶¶42. Petitioner incorrectly relies on Armitage’s purported teaching of sampling or ignoring data and on Barone’s teaching of filtering non-acceleration data. Petition at 20-21, 25-29. Neither, however, discloses or suggests filtering at least a portion of the accelerations, as required. *See* Ex. 2001 at ¶¶42-56. Further, Petitioner has failed to provide any motivation to combine Armitage and Barone. *Id.* at ¶¶64.

a. Petitioner Has Not Shown Armitage Teaches or Discloses the Claimed Filtering.

Petitioner has failed to establish that Armitage explicitly discloses any filtering at all and, in fact, acknowledges that “Armitage does not explicitly disclose a filter.” *See* Petition at 21. As an initial matter, and to the extent Petitioner is arguing that Armitage inherently discloses filtering, Petitioner does not identify what type of filter a POSA would understand to be inherently disclosed by Armitage, nor does Petitioner provide any evidence that a filter is “necessarily present” in Armitage. *See id.* at 10, 21-30; *see also* Ex. 2001 at ¶¶43-46. This is insufficient. *See HTC Corp. v. Cellular Commc'ns Equip., LLC*, 877 F.3d 1361, 1368 (Fed. Cir. 2017) (“The mere

fact that a certain thing may result from a given set of circumstances is not sufficient.”) (quoting *Cont'l Can Co. USA v. Monsanto Co.*, 948 F.2d 1264, 1269 (Fed. Cir. 1991)).

Further, Petitioner and its expert are simply wrong to equate sampling—which Petitioner admits occurs only “for a portion of a wheel rotation”—with filtering. *See* Petition at 20, 25-26; Ex. 2001 at ¶¶43-49. A POSA would recognize that acceleration data is constantly available and the term “sampling” as used in cited paragraph 45 of Armitage does not filter out acceleration data but is rather referring to how often this available data is collected. Ex. 2001 at ¶44. That is, a POSA would interpret the terms “sampling” and “sampled” in paragraph 45 of Armitage as referring to an action that was performed by the 3-D accelerometer during the acquisition of the data, i.e., at a given time to obtain the vibration reading. *Id.* Obtaining data through sampling—at different intervals—is a distinct concept from filtering data. *Id.* at ¶¶44-49. This interpretation is consistent with the plain and ordinary meaning of sampling of “sampling” (i.e., a small part selected as a sample for inspection or analysis. *See, e.g., id.* at ¶50 (explaining other example of sampling—videos sampling at various frames per second does not filter any data). In contrast, “filter[ing] a portion of the accelerations” within the context of claim 1 occurs at some point after the data is collected, i.e., after there is some acceleration data to filter. *Id.* at ¶44; *see also* Ex. 1001 at 13:15-20 (disclosing that the signal that

“originates with accelerometer hardware ... is passed to one or more sensor sections [that] select the data to be analyzed using a digital data filter ..., and passes this data on to a feature detector ...”).

Similarly, Petitioner incorrectly conflates “ignoring” data with “filtering” data. *See* Petition at 26 (arguing that during sampling “data could be ignored”); Ex. 2001 at ¶51. Armitage states that, as a result of the sampling period only capturing data for a portion of a single wheel rotation, the radial accelerations are “ignored” i.e., it is not filtered, but simply not gathered at all. *See* Ex. 1006 at ¶45 (stating that for sampling of the accelerometer, “the sampling *only occurs for a portion of a wheel rotation*, and *radial* acceleration or vibration (x-axis or y-axis) data could be ignored”); Ex. 2001 at ¶¶51-52 (explaining parallels between ignoring and sampling and distinction to filtering).

Petitioner also relies on Armitage’s disclosure of “amplifiers, analog-to-digital-converters, [and] microcontrollers” and claims—without analysis—that these devices necessarily “would mean the sensor is capable of filtering at least a portion of accelerations.” Petition at 26 (citing Ex. 1006 at ¶56). Petitioner does not explain how these structures purportedly contain any filters nor how they could be configured to perform any “filtering” of accelerations data, much less cite to any support therefore. *See id.*; *see also* Ex. 2001 at ¶52. Petitioner also fails to explain

how POSA would understand that these structures necessarily perform any filtering. *See id.*

At most, Armitage merely—and passively—obtains a small portion of the total accelerations monitored by the 3-D accelerometer but does not actively filter out any data. *See* Ex. 2001 at ¶¶43-52. Petitioner does not point to any disclosure in Armitage that performs any filtering of the acceleration data either before they reach the 3-D accelerometer or after the acceleration data has been obtained. *See id.* at ¶52. The process in Armitage is not the same process as the claimed “filtering” because nothing filters “at least a portion of the accelerations” *after* the acceleration data has been obtained by the sensors. *See id.*

Because Petitioner has not shown that Armitage discloses “one or more filters configured to filter at least a portion of the accelerations,” Grounds 1-3 fail.

b. Petitioner Has Not Shown That Barone Teaches or Discloses the Claimed Filtering.

Acknowledging the weakness of Armitage, Petitioner relies on Barone to supplement Armitage. *See* Petition at 27. However, like Armitage, Barone does not explicitly disclose any filtering of *acceleration data* that corresponds to the claim requirements of “measur[ing] accelerations of the railcar [and] filter[ing] at least a portion of the accelerations” of the railcar. *See* Ex. 2001 at ¶53. Rather, all Barone

does is precondition an analog signal and does so by preserving acceleration data.
(*Id.* at ¶¶35-59.)

Barone teaches “sampling” of data from an accelerometer before a preprocessing circuit, “i.e., signal conditioner 178,” removes non-acceleration data. *See* Ex. 1007 at ¶¶150, 175; *see* Ex. 2001 at ¶54-55. More specifically, the accelerometer of Barone outputs an analog signal *R* to a pre-processing signal conditioner 178 prior to the data being analyzed by a microprocessor to determine acceleration. *See* Ex. 1007 at ¶¶173-75; Ex. 2001 at ¶54-55. That is, and with reference to Barone FIG. 30 (reproduced below), the analog and pre-processed signal *R* includes the accelerometer outputs: *X* (axial) and *Y* (radial) accelerometer data. *See* Ex. 1007 at ¶¶173, 175, FIG. 30; *see* Ex. 2001 at ¶54-55.



FIG. 30

However, and contrary to Petitioner’s suggestions, no acceleration data is filtered out of the *R* signal — after the pre-conditioning, all accelerations continue to be present in the *S* signal. Ex. 2001 at ¶¶54-55. The signal conditioner 178 simply removes unwanted noise from the analog signal *R* prior to converting to a digital signal *S*. Ex. 1007 at ¶¶176-77; Ex. 2001 at ¶55 (further explaining that the signal conditioner 178 **does not** remove data that contains the measured acceleration data for the wheel axle). In fact, all of the acceleration data is still present, i.e., the *S* signal comprises *all of the measured acceleration data* for the wheel axle. Ex. 1007 at ¶¶176-77, 179, FIG. 30; Ex. 2001 at ¶¶55-56. Indeed, the purpose of Barone’s signal conditioner 178, which pre-conditions the analog signal for digital conversion, is to ensure the range of frequencies transmitted includes “the defect frequencies of interest and at least one resonant frequency of the truck, to ensure that any repeating peaks formed by acceleration resonance ... are permitted to pass.” Ex. 1007 at ¶¶177, 179; Ex. 2001 at ¶55.

A high or band pass filter—the first preconditioning filter—filters the signal *R* to remove signal components with frequencies below the minimum resonant frequency of railway trucks (i.e., 200 Hz). Ex. 1007 at ¶¶174, 176-77; Ex. 2001 at ¶55 (citing same and explaining that Barone discloses that accelerations due to bearing defects are typically reflected in the resonant frequencies of railway trucks, which range between 200-900 Hz). Stated another way, the first pre-conditioning

filter passes signal components with frequencies falling within the known range of resonant frequencies for the railway truck (i.e., passes frequencies greater than 200 Hz). *Id.*; Ex. 2001 at ¶55. A POSA would recognize that because the accelerations due to bearing defects are reflected in the passed resonance frequencies of the truck, ***all of the measured accelerations*** of the railcar ***are still present*** in the output signal of the first pre-conditioning filter. Ex. 2001 at ¶¶56-57.

The signal—with all acceleration data included—is then passed to an amplifier, which amplifies the voltages of the AC signal. Ex. 1007 at ¶176; Ex. 2001 at ¶56. This amplified output signal is then passed to a half wave rectifier. *Id.* The positive voltage half of the amplified AC signal passes through the half wave rectifier. Ex. 1007 at ¶176; Ex. 2001 at ¶56 (explaining that the negative voltage half is removed, which does not remove any information from the signal). Therefore, a POSA would understand that the signal that is outputted from the rectified waveform signal includes ***all of the measured accelerations*** of the railcar. Ex. 2001 at ¶56 (explaining all repeating pulses that output from the accelerometer and thus all measured accelerations are present).

This rectified waveform signal is then passed to a low or band pass filter—a second pre-conditioning filter—which filters the rectified waveform signal to remove signal components with frequencies above a resonant frequency of the truck (e.g., 290 Hz or 300 Hz) that still contains all the detected accelerations. Ex. 1007 at

¶176, 179. Stated differently, the second pre-conditioning filter passes signal components with frequencies between 200 Hz and 300 Hz. Ex. 2001 at ¶57. Therefore, the output signal of the second pre-conditioning filter still includes all of the measured accelerations, i.e., the repeating pulses which are output from the 3-D accelerometer. *Id.* A POSA would readily understand this second “pre-conditioning” is performed to minimize bit errors in the digital signals. *Id.*

At this point, signal *S* is then digitized and analyzed by the microprocessor and subjected to a discrete Fourier transform to identify therein the defect frequencies of interest. Ex. 1007 at ¶178; Ex. 2001 at ¶58. The discrete Fourier transform is performed to screen the measured acceleration data for various defect frequencies. Ex. 1007 at ¶178. A determination is then made, based on the result of the discrete Fourier transform operation, as to whether the analog signal output from accelerometer includes any periodic peaks repeating ***at any of the defect frequencies of interest.*** Ex. 1007 at ¶¶178, 185; Ex. 2001 at ¶58.

Therefore, a POSA would understand that Barone’s filter(s) identified by Petitioner just pre-condition a signal, removing unwanted noise from the analog signal to prepare it for the next stage of processing. Ex. 2001 at ¶59. No measured acceleration data for the wheel axle from the analog signal is removed. *See id.*; Ex. 1007 at ¶178-79, 185, FIG. 30. A POSA would recognize that the cited “filters” of Barone are not the same as or equivalent to the claimed filters and filtering required

by claim 1 of the '915 Patent, at least because the Barone “filters” merely eliminate noise and do not filter out measured accelerations data of the railcar. Ex. 2001 at ¶59. Therefore, Barone does not teach the above-recited limitation (d) of claim 1.

Accordingly, Petitioner has not established that independent claim 1 is unpatentable over Armitage in view of Barone. Further, because each of claims 22, 24-25, and 27-29 depend from independent claim 1, each is allowable by virtue of depending from an otherwise patentable claim. Ex. 2001 at ¶60

2. Claim 30

As discussed *supra* §II.D, Petitioner does not provide any analysis at all to support its assertion that claim 30 is unpatentable beyond a solitary cross reference to the limitations of Claims 1. As noted, this is a fatal deficiency. *See* §II.D, *supra* (incorporated here); Ex. 2001 at ¶¶61-63.

Nonetheless, taking Petitioner’s apparent position at face value, the combination of Armitage and Barone fails to disclose, teach, or suggest at least limitation 30(c): “filtering, by one or more filters, at least a portion of the accelerations.” Petitioner’s only argument is a cross reference to limitation 1(d). Petition at 39. However, Petitioner’s reliance on Armitage is deficient because, as described *supra*, the “sampling” and “ignoring” disclosed in Armitage is not the same as the claimed requirement for “filtering.” *See* §VI.A.1.a, *supra* (incorporated here); Ex. 2001 at ¶¶43-52. Similarly, Petitioner’s reliance on Barone is flawed

because Barone’s preconditioning is explicitly disclosed as allowing all accelerations to pass, and therefore does not “filter[] at least a portion of the acceleration,” as recited in limitation 30(c). *See* §VI.A.1.b, *supra* (incorporated here); Ex. 2001 at ¶¶53-60.

3. Claim 36

Petitioner does not provide any analysis at all to support its assertion that claim 36 is unpatentable beyond a solitary cross reference to limitation 1(d); as noted above this is a fatal deficiency. *See* §II.D, *supra* (incorporated here); Ex. 2001 at ¶¶64-67.

Nonetheless, taking Petitioner’s apparent position at face value, the combination of Armitage and Barone fails to disclose, teach, or suggest limitation 36(d): “one or more filters configured to filter at least a portion of the accelerations.” As with limitation 1(d), Petitioner’s reliance on Armitage is deficient because the “sampling” disclosed in Armitage is not the claimed “filtering.” *See* §VI.A.1, *supra* (incorporated here); Ex. 2001 at ¶¶43-52. Similarly, Petitioner’s reliance on Barone is flawed because Barone’s preconditioning is explicitly disclosed as allowing all accelerations to pass, and therefore does not “filter at least a portion of the acceleration,” as recited in limitation 36(d). *See* §VI.A.1, *supra* (incorporated here); Ex. 2001 at ¶¶53-60.

Claim 37 depends from independent claim 36 and is therefore patentable by virtue of depending from an otherwise patentable claim.

**4. A POSA would not have been motivated to modify
Armitage in view of Barone**

Petitioner does not provide any evidence to support its assertion that a POSA “would have been motivated to include the filtering taught by Barone” beyond the conclusory, mirror image statements of its expert. *See* Petition at 29, Ex. 1003 at ¶82. In fact, the paragraph on page 29 of the Petition is *identical* to paragraph 82 of Mr. Ricca’s declaration, with exception of the declaration citations in the Petition. *Compare* Petition at 29 *with* Ex. 1003 at ¶82. Mr. Ricca does not cite to any record evidence to support his opinion. This is plainly insufficient. *See* §II.C, *supra* (incorporated here). *Samsung Elec.*, IPR2022-00251, Paper 17 at 25 (dismissing petition and affording little to no weight to expert testimony that mirrored petition). As explained above, neither Armitage nor Barone disclose the claimed filtering. *See* §VI.A.1, *supra* (incorporated here). Further, Armitage does not suggest or disclose—and Petitioner does not argue otherwise—that the “sampling” techniques Armitage teaches benefit from improvement by incorporating filtering as taught by Barone. *See* §VI.A.1, *supra* (incorporated here); Ex. 2001 at ¶68. In addition, Barone expressly criticizes other data analysis techniques. *See, e.g.*, Ex. 1007 at ¶151 (“These processes result in improved power efficiency relative to more computation

intensive algorithms used in the prior art, where power is not a significant concern.”). Therefore, a POSA would not look to Barone to improve on the sampling techniques of Armitage and even if it did, a POSA would have no motivation to combine these disparate teachings. *See* Ex. 2001 at ¶68. Absent any evidence to support its conclusory allegations, Petitioner’s conclusory assertions amount to little more than impermissible hindsight reasoning.

B. Ground Two: Petitioner has failed to show a reasonable likelihood that Claim 21 is unpatentable under 35 U.S.C. § 103(a) in view of Armitage, Barone, and LeFebvre

Claim 21 depends from independent claim 1 and is therefore patentable by virtue of depending from a patentable independent claim. *See* §V.A.1, *supra* (incorporated here); Ex. 2001 at ¶¶69-71.

C. Ground Three: Petitioner has failed to show a reasonable likelihood that Claims 23 and 26 are unpatentable under 35 U.S.C. § 103(a) in view of Armitage, Barone, and Winfree

Each of Claims 23 and 26 depend from independent claim 1 and are therefore patentable by virtue of depending from a patentable independent claim. *See* §V.A.1, *supra* (incorporated here); Ex. 2001 at ¶¶72-74.

D. Ground Four: Petitioner has failed to show a reasonable likelihood that Claims 1, 21-22, 25, 27-30, 36, and 37 are unpatentable under 35 U.S.C. § 103(a) in view of LeFebvre and Barone

1. Claim 1

The combination of LeFebvre and Barone fails to disclose, teach, or suggest at least limitation 1(d): “one or more filters configured to filter at least a portion of the accelerations.” As an initial matter, the argument that LeFebvre does not disclose filtering was already presented to the Examiner and the prosecution history makes clear that the Examiner understood LeFebvre failed to disclose, teach, or suggest the “filtering” requirements of independent claim 1. *See* §II.A.1, *supra* (incorporated here); Ex. 1002 at 496-518. Even assuming *arguendo* the Examiner did not consider and reject this argument, Petitioner has failed to show that either LeFebvre or Barone teach or suggest this limitation.

Petitioner acknowledges that LeFebvre does not disclose the claimed filtering. *See* Petition at 55 (“LeFebvre does not explicitly require a ‘filter’....”). Further, and similar to Armitage, LeFebvre discloses “sampling” which a POSA would understand to be a different process from “filtering.” *See* Ex. 2001 at ¶¶75-76 (citing Ex. 1005 at ¶34 and explaining that the sampling does not filter but is meant only to ensure relevant frequencies will be detected).

Contrary to Petitioner’s argument, LeFebvre’s disclosure of sending only “essential indicative information” does not disclose the claimed filtering. *See* Petition at 54 (citing LeFebvre at ¶53). A POSA would understand from Petitioner’s cited disclosure that LeFebvre is referring to post-processing logical decisions about whether or not to send data. *See* Ex. 2001 ¶78. In fact, the cited passage discusses it

is a “burden” to transmit “all the data that might be sampled” and thus envisions procedures to “reduce the radio traffic to manageable portions.” *See id.*; Ex. 1005 at ¶53. A POSA would not consider the post-processing selective transmission of data disclosed in LeFebvre to be equivalent to a filter. *See* Ex. 2001 at ¶78 (explaining this down-sampling for data reduction purposes is not filtering of acceleration data).

Petitioner also argues that LeFebvre’s “preliminary analysis” discloses the claimed filter. *See* Petition at 54 (citing Ex. 1005 at ¶¶34-46). Petitioner’s cited disclosure, however, is directed to power management and — yet again — sampling periodicities. *See* Ex. 1005 at ¶¶34-36; Ex. 2001 at ¶79. For example, the instrumented pad of LeFebvre, which is “normally in a passive, low power state,” periodically turns on to conduct a preliminary analysis to “activate the [pad’s] microprocessor” and conduct additional readings if there is a problem detected by the preliminary analysis. Ex. 1005 at ¶34; Ex. 2001 at ¶79. A POSA would understand that such a power management protocol does not teach the claimed filtering. *Id.*

Acknowledging the weakness of LeFebvre, Petitioner relies on Barone to supplement LeFebvre. *See* Petition at 55. Barone, like LeFebvre, does not explicitly disclose any filtering of ***accelerometer data*** that corresponds to limitation 1(d), as explained above. *See also* §VI.A.1, *supra* (explaining why Barone does not teach or

disclose limitation 1(d), which is incorporated herein by reference); Ex. 2001 at ¶¶80-81 (explaining same and incorporating prior testimony, ¶¶53-60).

Accordingly, Petitioner has not met its burden to show that independent claim 1 is unpatentable over the combination of LeFebvre and Barone. Each of claims 21, 22, 25, and 27-29 depend on independent claim 1 and is therefore patentable by virtue of depending from an otherwise patentable claim.

2. Claim 30

Petitioner does not provide any analysis at all to support its assertion that claim 30 is unpatentable beyond a solitary cross reference to limitation 1(d); as noted above this is a fatal deficiency. *See* §II.D, *supra* (incorporated here); Ex. 2001 at ¶¶82-84.

Nonetheless, taking Petitioner’s apparent position at face value, the combination of LeFebvre and Barone fails to disclose, teach, or suggest limitation 30(c): “filtering, by one or more filters, at least a portion of the accelerations.” As with limitation 1(d), Petitioner’s reliance on LeFebvre is deficient because the “sampling” disclosed in LeFebvre is not filtering. *See* §VI.D.1, *supra* (incorporated here); Ex. 2001 at ¶¶76-80. Similarly, Petitioner’s reliance on Barone is flawed because Barone’s preconditioning is explicitly disclosed as allowing all accelerations to pass, and therefore does not “filter[] at least a portion of the

acceleration,” as recited in limitation 30(c). *See* §§VI.A.1, *supra*; VI.D.1, *supra* (both incorporated here); Ex. 2001 at ¶¶53-59, 76-80, 82-84.

3. Claims 36 and 37

Petitioner does not provide any analysis at all to support its assertion that claim 36 is unpatentable beyond a solitary cross reference to limitation 1(d); as noted above this is a fatal deficiency. *See* §II.D, *supra*. (incorporated here); Ex. 2001 at ¶¶76-80, 85-88.

Nonetheless, taking Petitioner’s apparent position at face value, the combination of LeFebvre and Barone fails to disclose, teach, or suggest limitation 36(d): “one or more filters configured to filter at least a portion of the accelerations.” As with limitation 1(d), Petitioner’s reliance on LeFebvre is deficient because the power management and selective post-processing transmission of data is a filter as recited in limitation 36(d). *See* §VI.D.1, *supra* (incorporated here); Ex. 2001 at ¶¶76-80. Similarly, Petitioner’s reliance on Barone is flawed because Barone’s preconditioning is explicitly disclosed as allowing all accelerations to pass, and therefore does not “filter at least a portion of the acceleration,” as recited in limitation 36(d). *See* §§VI.A.1, *supra* (incorporated here); VI.D.1, *supra*; Ex. 2001 at ¶¶53-59, 76-80, 82-84.

Claim 37 depends from independent claim 36 and is therefore patentable by virtue of depending from an otherwise allowable claim.

E. Ground Five: Petitioner has failed to show a reasonable likelihood that Claims 24 and 37 are unpatentable under 35 U.S.C. § 103(a) over LeFebvre in view of Barone and Armitage

1. Claim 24

Claim 24 depends on independent claim 1 is patentable by virtue of depending from a patentable independent claim. *See* §V.A.1, *supra*; §V.D.1, *supra* (both incorporated here); Ex. 2001 at ¶89.

2. Claim 37

Claim 37 depends on independent claim 36 is patentable by virtue of depending from a patentable independent claim. *See* §V.A.1, V.A.3, *supra*; §V.D.1, V.D.3, *supra*(all incorporated here); Ex. 2001 at ¶¶90-91.

F. Ground Six: Petitioner has failed to show a reasonable likelihood that Claims 23 and 26 are unpatentable under 35 U.S.C. § 103(a) over LeFebvre in view of Barone and Winfree

Claims 23 depends on independent claim 1 and is therefore patentable by virtue of depending from a patentable independent claim. *See* §V.A.1, *supra*; §V.D.1, *supra*(both incorporated here); Ex. 2001 at ¶¶92-93.

VII. CONCLUSION

For the reasons described above, the Board should decline to institute *inter partes* review.

Respectfully submitted,

Dated: May 15, 2023

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CERTIFICATION

Patent Owner's Preliminary Response, excluding the caption, Table of Contents, Table of Authorities, Table of Exhibits, and this Certification contains 9,585 words as measured by the word processing software used to prepare the document, in compliance with 37 C.F.R. § 42.24(d).

Respectfully submitted,

Dated: May 15, 2023

By: / Ryan N. Miller /

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §42.6(e), I certify that on this 15th day of May, 2023, a copy of PATENT OWNER'S PRELIMINARY RESPONSE under 37 C.F.R. §42.107 was served by electronic mail on Petitioner's counsel, lead and back-up, as follows:

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Counsel for Petitioner has consented to service of all documents via electronic email. *See* Petition, Paper 1 at 2.

Dated: May 15, 2023

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