

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 IPR2023-00538

Patent No. 9,365,223

**PATENT OWNER'S SUR-REPLY TO PETITIONER'S REPLY TO PATENT
OWNER'S RESPONSE**

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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)
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2007	U.S. Patent No. 7,698,962 to LeFebvre et al. (“LeFebvre ’962”)
2008	Declaration of LeFebvre
2009	U.S. Patent Application Publication No. 2008/0195265 to Searle et al. (“Searle”)
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Patent Owner Amsted Rail Company, Inc. (“PO”) submits this Sur-Reply in support of its Patent Owner Response (“POR”). Petitioner has failed to establish by a preponderance of the evidence that any claim of the ’223 Patent is unpatentable.

I. CLAIM CONSTRUCTION

A. “housing”

In support for its position that “housing” should not be construed as “an enclosure”, Petitioner has cherry-picked *Phillips v. AWH Corp.*, 415 F.3d 1303, 1323 (Fed. Cir. 2005), without considering the important holding and guidance set forth regarding claim construction. The specification is “the single best guide to the meaning of a disputed term.” *Phillips*, 415 F.3d at 1321. Moreover, “[a] claim should not rise or fall based upon the preferences of a particular dictionary editor, or the court's independent decision, uninformed by the specification....” *Id.* at 1322. It is important that the Board, “at the outset”, focus on “how the patentee used the claim term in the claims, specification, and prosecution history, rather than starting with a broad definition and whittling it down.” *Id.* at 1321.

The term “housing” as an enclosure is not merely a definition inherent in one embodiment of the ’223 Patent, but rather the *only* practical definition one of ordinary skill could interpret from considering the entire specification as well as the claims. *See* EX2010, ¶¶14-22. As noted in the POR, not only are there several instances in the specification where the term “housing” refers to an enclosure that

electronic components may be positioned within, *see* EX1001, 3:60-63, 4:5-14, 4:23-29, 15:19-24, FIGs. 1, 2, 3, 3A, but also the claims specifically state that the electrical circuitry, power source, and communication device are all located “within” the housing. *See* Claims 1, 2, 23; POR, 4, 5. Additionally, an “alternate embodiment” expressly differentiates the meanings of the terms “housing” and “pad” by distinguishing “ housings” over “those built in to the railcar itself” such as the earlier pad embodiments of the LeFebvre reference.¹

II. ****GROUND**s 1-3**

A. **Claims 2-4 and 27-30: LeFebvre fails to disclose a sensor device comprising a housing or electrical circuitry within said housing**

As noted above in Section I, motes built into the railcar itself in the form of an adapter pad do not have a “housing” as described and claimed in the ’223 Patent. LeFebvre specifically states that the adapter pad “contains a plurality of sensors 5 which are preferably embedded into its upper, side and lower surfaces or into other locations.” Petitioner fails to address the critical fact noted in the POR that adapter pads were already a common component of railcars at the time of Lefebvre’s

¹ Petitioner’s expert improperly equates the specification’s “alternate housing” with these earlier LeFebvre references, ignoring the unambiguous word “*or*”. EX1033, ¶6.

invention, and Lefebvre merely embedded sensors into these pads – a distinctly different invention than the sensor devices claimed in the '223 Patent. *See* EX2010, ¶¶22, 29; EX2008, ¶¶10-12; EX2006.

Petitioner also fails to acknowledge the fact that, as noted in the POR, LeFebvre refers to Van Auken (EX2006) for details on adapter pads. Van Auken makes clear the term “pad” has a specific meaning as a term of art for a load bearing component of a railcar directly between a bearing adapter and the frame. POR, 9; EX2010, ¶29; EX2008, ¶6. As noted by PO’s expert, the “pad” of LeFebvre must be mounted in a specific, horizontal and load-bearing position, and none of the embodiments of the '223 Patent describe an installation that would even be possible with the sensor pad disclosed in LeFebvre. EX2010, ¶¶29-31; EX2008, ¶12. Petitioner misunderstands the significance of this when stating that “[n]othing in the claim language specifies a particular mounting location, or that the housing must be moveable between different locations....” Reply, 4. The consequence of LeFebvre disclosing a well-recognized, flat and load-bearing “adapter pad” with a known, definitive configuration is that it is structurally distinct from anything disclosed in the '223 Patent, and quite simply, not a “housing” at all – whether or not it is “mountable on a railcar.” Reply, 4. In other words, the fact that the sensor motes have a “housing” is what makes them movable and mountable, contrary to the adapter pads. EX2008, ¶¶10-12.

Contrary to Petitioner’s assertion, these arguments are consistent with the claim language. The ’223 Patent discloses that the housing may comprise “a hard plastic resistant to environmental damage, such as a UV rated polymer, e.g., a polycarbonate/ABS blend.” EX1001, 4:7-9. Lefebvre’s adapter pads, to the contrary, are “preferably comprised of a cast or injected molded elastomeric polymer.” EX2005, ¶19. This is not a material that a POSITA would consider as suitable for the housing disclosed in the ’223 Patent. EX2010, ¶29 (“coating something with a polymer does not constitute a ‘housing’”). The elastomeric coating would be contrary to the primary purpose of the housing, to ensure components are both protected and removable. *Id.*; EX2008, ¶9.

Petitioner further asserts that Lefebvre discloses electrical circuitry positioned within the housing because adapter pad 16 and extended portion 17 could include “internal partitions or divisions”, or they could somehow be a housing that is not “constructed from a single unitary body.” Reply, 4. Petitioner cites only to the Board’s preliminary Institution Decision, which is not evidence. Initially, LeFebvre teaches away from these structures being one single component. *See* POR, 11-12, EX2010, ¶¶34-35. Petitioner fails to realize that LeFebvre simply does not disclose a “communication device capable of broadcasting information... via wireless communication” positioned within the *same* housing, because components 16 and 17 are depicted as separated by a boundary and the antenna is exterior to the

boundary of component 17. EX2010, ¶34 (citing EX1005, ¶21, Fig. 3). In contrast, the sensor circuitry is embedded into a *load bearing* portion of the adapter pad, a location that LeFebvre itself declares unsuitable for communications circuitry. EX1005, ¶21 (“extended attachment portion 17 [is] located so as to be *relatively isolated from the forces transmitted through the adapter*”).² That is what is disclosed in LeFebvre and that disclosure does not teach and suggest that the communications circuitry is placed in the same housing as the sensor circuitry. *Id.* Petitioner’s handwaving does not change that disclosure into something it’s not.

B. Claims 5-10, 18, 20, 21, 26, 31, and 32: LeFebvre fails to disclose determining actual failures and using statistical analysis to predict potential or imminent failures.

Petitioner still fails to address the fact that “heuristics” and “statistical analysis” have different meanings and LeFebvre does not disclose the performance of *both*—in fact, as noted in the POR, LeFebvre does not even mention “statistical analysis.” Rather, Petitioner asserts that Lefebvre uses heuristic methods, “which include statistical analysis” to detect potential failures. Reply, 8. This statement confirms the deficiencies in Petitioner’s reasoning, since the ’223 Patent claims require that the CMU perform each distinct analysis. Moreover, while Petitioner makes the blanket statement that Lefebvre discloses “heuristics that use statistical

² All emphasis added unless otherwise stated.

techniques to ... identify potential or imminent failures,” Reply, 7, it still fails to point to anything in LeFebvre that actually discloses a system performing statistical analysis to establish forward looking predictions. **None** of the methods of “statistical analysis” presented by Petitioner in its Reply actually describe what is disclosed in Lefebvre, which, as described in the POR by PO’s expert is “using a direct measurement to draw an inference of a condition, e.g. of the roller bearing.” POR, 17; EX2010, ¶43. Petitioner’s expert opines, with no citation to **any** supporting evidence, that this type of inferencing is “statistical sampling” based on the Nyquist–Shannon sampling theorem. EX1033 ¶11.

Initially, this is a new argument presented for the first time on Reply. PO has no opportunity to present additional evidence for rebuttal, therefore the argument should not be considered. *Pioneer Pet Prods., LLC v. Oil-Dri Corp.*, IPR2022-00691, Paper 31, 29 (PTAB Sept. 12, 2023) (rejecting new arguments made in reply because “Patent Owner had no notice that Petitioner would rely on such arguments and evidence, and no ability or reason to address the arguments as part of its Response.”). Nevertheless, Petitioner does not explain what the Nyquist–Shannon sampling theorem is or how it applies to this case at all. Petitioner’s other arguments suffer from the same deficiency. The Board has no obligation to credit this unsupported, conclusory opinion. *See* 37 C.F.R. §42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled

to little or no weight.”). Regardless, the central point is that Petitioner relies on the same disclosure for both heuristics and statistical analysis and provides nothing but conclusory expert testimony to justify this omission. The citations to LeFebvre are simply insufficient to meet Petitioner’s burden to show obviousness. *See Samsung Elecs. Co., Ltd. v. Rightquestion, LLC*, IPR2022-00251, Paper 17 at 23 (PTAB June 9, 2022) (declining to credit expert where “declarant makes these same statements verbatim, without more, and with no additional citations to evidence”). *In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1368 (Fed. Cir. 2004) (“[T]he Board is entitled to weigh the declarations and conclude that the lack of factual corroboration warrants discounting the opinions expressed in the declarations.”).

Petitioner misquotes PO’s statement regarding the differences between claims 1 and 5 in an apparent belief that this relieves it of the burden to show unpatentability. *See* Reply, 9; POR, 19. The point made in the POR is that the limitation found in claim 5 is *different*, not broader, than claim 1, because sampling is different than power management. Entirely unaddressed by Petitioner or Petitioner’s expert is that “[a] POSITA would not confuse [a sampling interval with power consumption management] the way Petitioner and its expert appear to have done.” EX2010, ¶45.

C. Claims 23 and 25 (Ground 1)

Petitioner has not shown that LeFebvre discloses, teaches, or suggests a housing “mountable on a railcar,” and has failed to address the fact that the adapter

pad is a flat pad that functions as a load bearing and attenuation means, and it (along with any extended portions attached thereto) is formed to seat upon the upper surface of adapter 4, which seats in turn on the bearing, *see* EX1005, ¶19 and FIG. 4. In other words, it is not seated, or even mountable, on the railcar. Also, a POSITA would not find (i) “electrical circuitry,” (ii) a “power source,” and (iii) a “communication device” all “positioned within” any housing. *See* EX2010, ¶50; §II.A, *supra* (incorporated here).

D. Petitioner still provides no evidence that a POSITA would have been motivated to modify LeFebvre

Petitioner’s Reply is silent regarding any explanation as to how a POSITA would have been motivated to modify the LeFebvre pad to be a housing for enclosing electronic components. Such silence is an admission that no such explanation exists.

E. Claims 13-17, 22, and 24 (Ground Two)

Petitioner’s statement that PO has not “identified any features that would patentably distinguish the cited references” is false. Reply, 10. PO has outlined numerous deficiencies of Lefebvre, both above and in the POR. As noted in the POR (and ignored by Petitioner), Barone fails to disclose, teach, or suggest “a communication management unit [that] applies heuristics to analyze data collected from said one or more sensor units (a) to determine if an actual failure exists and (b) to predict potential or imminent failures based on a statistical analysis of said

collected data.” With respect to claim 24, Petitioner’s arguments fail for the same reasons discussed above, and it is noteworthy that Petitioner’s expert still does not address the phrase “spaced from” to explain how the temperature sensor in LeFebvre is “disposed outside of and spaced from said housing.”

F. Claims 1 and 24³ (Ground Three)

There are numerous deficiencies with regard to Lefebvre. *See* §I.A, II.A, II.C, *supra*. (incorporated here). Petitioner is silent on how or where Denny or Provasnik disclose a “housing,” “mountable on a railcar,” with (i) “electrical circuitry,” (ii) a “power source,” and (iii) a “communication device” positioned within said housing. Petitioner’s expert opines only that Denny provides evidence that external temperature sensors are external components and Provasnik provides evidence that magnetic sensor attachments are standard components. While PO disagrees with both assertions, the basic and fundamental deficiencies in Lefebvre mentioned above have not been addressed and it is Petitioner’s burden to do so.

III. ARMITAGE IS NOT PRIOR ART TO THE ’223 PATENT

A. Petitioner has not met its burden of production to demonstrate that Armitage is entitled to a priority date of May 11, 2010

Petitioner did not submit the Armitage provisional with the Petition and

³ Claims 1 and 24 have a priority date of March 13, 2013.

should not be permitted to submit it in reply and deprive PO the opportunity to respond with evidence in its POR. POR, 25. Nonetheless, Petitioner failed to meet its burden triggered by Amsted's evidence of prior invention to prove that Armitage is entitled to the benefit of the Armitage Provisional filing date by showing written description support for the claimed subject matter in the provisional. *See Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1381 (Fed. Cir. 2015).

Petitioner provides a single, conclusory sentence with a string citation to demonstrate support in the Armitage Provisional for *only Claim 1* of Armitage, without any analysis or explanation. Reply, 10. Armitage includes *twenty* claims. This is insufficient to meet Petitioner's burden. *See B.E. Tech., L.L.C. v. Google, Inc.*, No. 2015-1827, 2016 WL 6803057, at *7 (Fed. Cir. Nov. 17, 2016) (burden not met by a string citation to eighteen different pages without explanation as to why the cites supported the claim limitations). Likewise, Petitioner provided a table with citations linking the specifications of Armitage and the Armitage Provisional, without any analysis to demonstrate support for the claims of Armitage. Reply, 10-11. Petitioner has failed to meet its burden and Armitage is not entitled to its provisional date under §102(e).

Even if the Board were to find the Petitioner did meet its burden, there are specific sections of the invention recited in the Armitage Patent that Petitioner relies on in its Petition as support for its obviousness arguments that have no support in

the provisional and therefore cannot be entitled to the provisional filing date. For example, Petitioner asserts that the '223 Patent, limitations 13(a), 13(c), 13(d), 15, 16, 28 are invalid because Armitage “refers to a ‘Data Correlation Unit’ (“DCU”) that analyzes collected data The DCU may include the control node (i.e., the CMU) *or* the collection node (i.e., the base unit).” Petition, 70, citing EX1006, ¶43, EX1003, ¶305. The Armitage provisional however, requires that the DCU is equipped on the railcar, and the collection node is only disclosed as *not* located on the railcar (hence, the DCU *cannot* comprise the collection node). *See* EX1031, Fig. 1. Limitations 13(a), 13(c), 15, 16, and 28 also improperly use “DCU” interchangeably with the “collection node” and/or “the base unit”. *See, e.g.* Petition 71, stating “this analysis is performed by the DCU, which can be a part of the collection node (i.e., the base unit).”

Therefore, Petitioner has not met its burden under *Dynamic Drinkware* to establish that Armitage is entitled to its provisional filing date under §102(e).

B. Amsted has met its burden to produce evidence of prior conception⁴

Petitioner presumes that to meet its burden of proof of prior conception, PO

⁴ For clarity, claims 2–10, 18, 20, 21, 23, and 25–32 are subject to PO’s prior invention evidence.

must recite a claim-by-claim analysis of conception. Reply, 12. Rather, conception must be proven by corroborating evidence, the sufficiency of which is determined by the “rule of reason”, and “[t]here is no particular formula that an inventor must follow in providing corroboration of his testimony of conception.” *Singh v. Brake*, 222 F.3d 1362, 1367 (Fed. Cir. 2000). The ’223 Patent consists of claims amounting to nearly 1000 words, so it is impractical to expect a meaningful claim-by-claim evaluation within the constraints of a POR: “[t]he invention is not the *language* of the [claim] but the subject matter thereby defined.” *Mycogen Plant Sci., Inc. v. Monsanto Co.*, 243 F.3d 1316, 1336 (Fed. Cir. 2001).

Amsted has demonstrated that the inventors conceived of each feature of the invention through a chronological presentation, where limitations that were invented together or simultaneously are addressed together. All critical pieces of corroborating evidence have been both explained and cited within the response. Petitioner fails to recognize that such evidence must be considered as a whole, rather than individually and “[i]t is sufficient if the picture painted by all of the evidence taken collectively gives the board ‘an abiding conviction’ that prior conception is ‘highly probable.’” *Price v. Symsek*, 988 F.2d 1187, 1195–96 (Fed. Cir. 1993).

The following table provides exemplary instances where each limitation was discussed within the POR, including the exhibits relied upon. Similarly, the table sets forth many examples from “intensive research and development work” (Reply,

13) establishing that inventor Martin sufficiently demonstrated conception of the subject matter defined by the claim limitations, despite not having used “in haec verba” claim language. *Mycogen*, 243 F.3d at 1336.

Claim Limitation	POR citation	Martin Declaration
2	p. 31-32, explaining EX2020; EX2013, ¶20; EX2040: “The illustration depicts a system of monitoring railcar performance utilizing a variety of sensors, or motes, attached to the railcar and communication circuitry allowing the motes to wirelessly transmit the sensor readings to a receiver;” p. 27-28, explaining EX2092; EX2013, ¶11; EX2136, 2013, ¶12: “....Martin authored assembly instructions... detailing [each element listed in the claim]” p. 30-31, explaining EX2017, 5, 8, 9; EX2018; EX2047; EX2090; EX2013, ¶18:	p. 9-12, ¶20, explaining EX2020, EX2021, inserting descriptions, drawing, and pictures of an overview of the system. p. 4, ¶11, explaining EX2092: “I authored assembly instructions detailing [the parts]... enabling the device to communicate information regarding temperature.” p. 5, ¶14, explaining EX2162: “...the inventive system includes a plurality of the temperature sensing devices that are installed on a plurality of railcars that collect data at periodic intervals and communicate with wireless communication management units (CMU’s), wherein the

	“An internal IONX presentation ... demonstrating how these motes formed a remote wireless mesh network of sensors collecting temperature data using a wake/sleep power management, and communicating that data with a CMU and off-railcar locations using satellites.”	CMU’s also receive data from an external (ambient) temperature sensor.” p.6, ¶18, explaining EX2017: “I produced a presentation describing a condition monitoring system ...that combined the new WSNs with our Series 3 communication management units (CMUs) in a mesh network.”
3	<i>See</i> 2 above <i>See also</i> p. 32-33, describing “an alarm system with multi-tiered severity levels....” that communicated alerts “when the bearing temperature is outside of a certain range”; <i>See also</i> p. 34, referring to EX2021 photos showing “the motes on the adaptor, the ambient mote the communication unit on the hand brake end and the loco cab equipment.”	p. 9, ¶19, explaining EX2019; EX2058: “Word document ... describes revised alarm stages that limit alerts... until actionable events occur.” <i>See</i> 2 above, wherein p.11-12 includes “described alert instructions, including four alarm stages....”;
4	<i>See</i> 2, 3 above	<i>See</i> 2, 3 above

5a	<i>See</i> 2 above, explaining EX2092; EX2013, ¶11 <i>See also</i> p. 28, explaining EX2162 (and describing the “test plan” including “a description of the test equipment, installation/operation instructions and strategy, and output expectations”)	<i>See</i> 2 above, explaining EX2092 <i>See also</i> p. 5, ¶14, explaining EX2162: “...the inventive system includes ... temperature sensing devices ... installed on ... railcars that collect data at periodic intervals and communicate with wireless communication management units (CMU’s), wherein the CMU’s also receive data from an external (ambient) temperature sensor”
5b	<i>See</i> 2 above <i>See also</i> p. 33, explaining EX2020; EX2013, ¶20: “.... a cab display indicating messages determined from applying heuristics to the received data, ... demonstrating the ability to communicate alerts in a network with other railcars when the bearing temperature is outside of a certain range.”	<i>See</i> 2 above <i>See also</i> p. 3, ¶9: “The data gained from these studies was directly impacting algorithm and heuristics development for eventual evaluation, validation, and testing [including] analysis of train hardware in which actual or potential faults were detected.” <i>See also</i> p. 13, ¶23:

		“... discussions ... regarding the algorithm instructions regarding certain temperature thresholds in order to fix frequent alarm[s]....” <i>See also</i> p. 16, ¶27: “They would analyze the data using our algorithms and would flag bearings that tripped the various thresholds we gave them.”
6	p. 31, explaining EX2019; EX2013, ¶19; and EX2058: “.... various alarm stages that limit alerts sent to a locomotive terminal until actionable events of sufficient severity occur.... Martin relayed changes and instructions for the severity levels to be used for triggering alerts.”	<i>See</i> 3 above; <i>See also</i>, p. 15, ¶26, explaining EX2031, EX2032, EX2033, and EX2056: “...the team began work on a procedure for the configuration of temperature settings, enabling us to update thresholds on all nodes of all units to calibrate the sensors.”
7	<i>See</i> 5b above	<i>See</i> 5b above
8	<i>See</i> 2, 5a above	<i>See</i> 2, 5a above, wherein ¶11 further describes each of the claim elements.
9	<i>See</i> 2 above	<i>See</i> 2 above, further explaining EX2017:

		“The WSNs used wake/sleep power management such that they would typically be off and not using power most of the time.”
10	<i>See</i> 5a above	<i>See</i> 5a above
13a	<i>See</i> 3, 5a above <i>See also</i> p. 28 further explaining EX2162: “....collect data at periodic intervals and communicate with wireless communication management units (CMU’s), wherein the CMU’s also receive data from an external (ambient) temperature sensor.”	<i>See</i> 2, 5a above
13b	<i>See</i> 5b above	p. 10-11, ¶20, inserting pictures of “a cab display indicating messages” and describing “alert instructions”
13c	<i>See</i> 6 above	<i>See</i> 3, 13b above
14	<i>See</i> 2, 13a above	<i>See</i> 2 above
15	<i>See</i> 2, 3, 6 above	<i>See</i> 2, 3, 6, 13b above, further describing at p. 11, ¶20, the “Bearing Trending” that “[w]ill be used for trending recommendations....”
16	<i>See</i> 5b above	<i>See</i> 3, 5b above, wherein p. 9, ¶19 further describes “instructions

		for programming the tiered alerts based on ... severity levels....”
17	<i>See 2, 5a above</i>	<i>See 2, 5a above</i>
18	<i>See 2 above</i>	<i>See 2 above</i>
20	<i>See 6 above, wherein EX2019 states: “prior to the trip we had alarm levels set at temperatures that didn’t take into account the Australian rail network and its ability to handle trackside maintenance.”</i>	<i>See 3, 6 above</i>
21	<i>See also p. 31, explaining EX2019: ““setting locomotive alarm thresholds at values that are sub-critical will lead to too many stoppages and delays’ ... make determinations about repeat temperature offenders and/or trending events.”</i>	<i>See also p. 15, ¶16: “These bearing temperatures were monitored and analyzed to make the bearing temperature algorithms more robust.”</i>
22a-e	<i>See 6 above; See also p. 39, wherein it is noted that the temperature analysis was continuous through April, and explained that EX2022 included “a chart of the various detected temperatures and associated actions”, and “data results.” Such data results included (on</i>	<i>See 6 above, wherein EX2031 includes a table of old and new threshold parameter values for the algorithms</i>

	p. 15 of EX2022) “temperatures sampled every 15 secs – averaged over 1 minute”.	
23	<i>See 2 above</i>	<i>See 9 above</i>
25	p. 28, explaining EX2165; EX2014, ¶22; EX2166; EX2013, ¶17: “one algorithm for bearing condition assessment ‘has been incorporated into the IONX software and is currently being bench tested in West Chester,’ and then ... discussed ... a timetable for SCT installations.” <i>See also 5a above</i>	<i>See 5b above</i> See also p. 15, ¶26, explaining EX2031, EX2032, EX2033, and EX2056: “...bearing temperatures were monitored and analyzed to make the bearing temperature algorithms more robust.”
26	<i>See 5b above, wherein EX2020 describes the alert instructions predicting potential/imminent failures</i>	<i>See 25 above wherein the inserted presentation from EX2020 describes the alert instructions predicting potential/imminent failures</i>
27	<i>See 13a above, where temperature readings and gradients are flagged based on degrees above ambient, and 22a-e above, where EX2022 temperatures are averaged and graphed against the ambient</i>	<i>See 25 above wherein the inserted presentation from EX2020 describes the “Above Ambient Alarm”</i> <i>See also 2 above</i>
28	<i>See 2, 5a above</i>	<i>See 2, 5a above</i>
29	<i>See 2 above</i>	<i>See 9 above</i>

30	<i>See 2 above</i>	<i>See 2 above</i>
31	<i>See 2 above</i>	<i>See 9 above</i>
32	<i>See 2 above</i>	<i>See 2 above</i>

Petitioner’s assertion that Amsted relied on the Shamos declaration as an improper incorporation by reference is incorrect. While “[a]rguments must not be incorporated by reference from one document into another document” (37 C.F.R. §42.6(a)(3)), here, Shamos incorporated the claim chart attached to his own declaration *into his own declaration*. However, the POR made its entire case without incorporating the Shamos declaration or its attached claim chart (there are no cites to EX2010 in the above table). This is distinctly different from *Cisco*, where the “Declaration [was used] to support conclusory statements that [were] not otherwise supported in the Petition.” *Cisco Sys., Inc. v. C-Cation Techs., LLC*, IPR2014-00454, Paper 12 at 9 (PTAB August 29, 2014).

Here, the claim chart provides supporting evidence for the Board to consider, which is not improper. *Group III Int’l, Inc. v. Targus Int’l LLC*, IPR2021-00371, Paper 43 at 3 (PTAB Oct. 21, 2021) (an expert’s “testimony, including the added claim charts, is relevant to a claim for which trial has been instituted”). The claim chart merely transfers the chronological POR into a succinct claim analysis developed by an expert, for additional consideration by the Board.

C. Amsted has shown conception by at least April 2010

Petitioner also improperly characterizes the “core features” of the claimed

invention. The core features as they relate to the '223 Patent are the claim limitations, and as noted in the table above and addressed in the bullets below, Amsted did “have a definite and permanent idea” of these features by April 4, 2010. It is well established that improvements after conception do not refute conception and reduction to practice. *ATI Techs. ULC v. Iancu*, 920 F.3d 1362, 1372-73 (Fed. Cir. 2019) (“Diligence is not negated if the inventor works on improvements and evaluates alternatives while developing an invention.”). Certain inventions require significant testing to reduce the invention to practice, “in order to have something [to] productize”, *Id.*, and conception is only *not* complete if subsequent experimentation reveals factual uncertainty which “so undermines the specificity of the inventor’s idea that it is not yet a definite and permanent reflection of the complete invention as it will be used in practice.” *Burroughs Wellcome Co. v. Barr Labs., Inc.*, 40 F.3d 1223, 1229 (Fed. Cir. 1994). Each of Petitioner’s bullet points are separately addressed herein:

- Petitioner is incorrect that the four “alert stages” were based upon “industry thresholds”. Actually, in Exhibit 2013, ¶¶ 20-23 cited by Petitioner, Martin refers to the “*temperature* thresholds” - merely a single parameter used to tailor the algorithms. Exhibit 2050 elaborates that the temperature thresholds were changed (after conception) from North American standards to better reflect Australian rail practices “to make *improvements* to the existing

algorithms.” As Petitioner notes, the teams’ work was to “make these algorithms more efficient” and the results demonstrated they were “on the right track” – hardly sufficient evidence to reveal “factual uncertainty”. Moreover, it is worth noting that precise “Level 2” and “Level 3” algorithms are *not* actually described in the ’223 patent claims – the claims recite determining “high level alarms” (claims 13c, 15, 16). In Exhibit 2100 cited by Petitioner, the inventors note that the word “stages” is interchangeable with “levels”, and as shown in the table above, *four stages* of such “levels” *were* initially conceived. More specific subsequent work on enhancing the “levels” were mere improvements to the initial concept.

- It is irrelevant that the inventors might not have chosen precise locations of the sensors, as the claims also do not dictate specific locations.
- Petitioner has failed to recognize that the nodes *were* initially configured to collect data at periodic intervals during conception: “The current data set from the SCT field test is sampled every minute.” EX2146, 8. Changing collection intervals to “save power and bandwidth” also does not create “factual uncertainty” to undermine conception, but instead demonstrates diligent research for reduction to practice.
- The table above shows evidence that each of the claims relating to the sensing units were conceived by April 2010. The fact that testing was required for

“significant reduction in communication overhead” does not negate conception.

Next, the assertion that the system must work for conception to occur is directly contrary to controlling caselaw: “an inventor *need not know that his invention will work* for conception to be complete.... He need only show that he had the idea....” *Burroughs* 40 F.3d at 1228 (cleaned up). As noted above, diligence is not negated if the inventor works on improvements and evaluates alternatives, and Petitioner’s contention that researchers needed to work diligently after conception only affirms the complexity involved in reducing this type of system to practice, which depended upon: “the nature and timing of this testing, the testing environment, and the collection and analysis of millions of results (including awaiting results from numerous railcar trips and numerous railcars in Australia).” POR, 47.

Ample evidence establishes that conception of each of the challenged claims included all required features.

D. Amsted’s conception and reduction to practice suffices to disqualify Armitage

As noted in the POR, the corroborated evidence confirms that the inventors conceived the invention claimed in the ’223 Patent and then exercised reasonable diligence in reducing it to practice. Amsted clearly met the well-established legal standard for determining reduction to practice in an IPR since they (1) “*constructed*

an embodiment or performed a process that met all the limitations of the claimed invention,” and (2) “determined that the invention worked for its intended purpose.” *Cooper v. Goldfarb*, 154 F.3d 1321, 1327 (Fed. Cir. 1998).

Petitioner relies on a quotation of *In re Clarke*, 356 F.2d 987, 992 (C.C.P.A. 1966) in a recent Federal Circuit case for the contention that Amsted’s reduction to practice somehow required a specific embodiment that is dictated by the prior art reference rather than what is recited in the claims. Reply, 22 (quoting *Mylan Pharms. Inc. v. Merck Sharp & Dohme Corp.*, 50 F.4th 147, 154 (Fed. Cir. 2022)). *Clarke* merely stands for the notion that, to properly antedate a reference during prosecution of a genus claim, the applicant must show prior invention of the species disclosed in the reference relied upon in the rejection of the genus. *See Clarke*, 356 F.2d at 963 (“We must conclude that the showing only of the making of the phenyl species is of little probative value on the issue of whether the isopropyl species is antedated.”). Here, in contrast, PO has established prior invention of the specific subject matter claimed. Petitioner’s own case law establishes that this is sufficient. *See Mylan*, 50 F.4th at 154-55 (affirming Board finding of prior invention antedating reference notwithstanding appellant’s arguments that the reference recited additional embodiments that were not reduced to practice).

IV. GROUND 4-6

A. Claims 2, 3, and 26-28 (Ground 4)

Petitioner offers no counter-explanation to the reasoning in POR 52-53 that Armitage is not prior art to claims 2, 3, and 26-28.

B. Claims 4, 29, and 30 (Ground 5)

Petitioner offers no counter-explanation to the reasoning in POR, 52-53 that Armitage, in view of LeFebvre, is not prior art to claims 2, 3, and 26-28.

C. Claims 5-10, 13-18, and 20-22 (Ground 5)

Petitioner offers no counter-explanation to the extensive reasoning in POR, 53-56 that there is no motivation to modify Armitage in view of LeFebvre except to state that “[a] PHOSITA would understand that LeFebvre’s power management techniques are fully compatible with “continuous” monitoring of railcar components as understood by a PHOSITA.” Reply, 23 (citing EX1033, ¶13). Again, Petitioner’s citation to a bald and unsupported statement in its expert declaration is insufficient to meet its burden. *See* 37 C.F.R. §42.65(a). It is also incorrect for the reasons stated previously. *See* EX2010, ¶73. Petitioner then cites to Lefebvre’s statement regarding deficiencies in the prior art from the Background and a general statement of “the objective” of Lefebvre’s disclosure in the Summary. None of this provides any explanation for why a POSITA would combine the power management techniques disclosed in Lefebvre with the continuous monitoring system described in Armitage.

“[T]his analysis should be made explicit.” *KSR Int’l Co. v. Teleflex Inc.*, 550 US 398, 418 (2007). Petitioner has simply not met its burden.

D. Claims 23 and 25 (Ground 5)

Petitioner offers no counter-explanation to the reasoning in POR, 61 that Armitage, in view of LeFebvre, is not prior art to claims 23 and 25.

E. Claims 1 and 24 (Ground 6)

Petitioner offers no counter-explanation to the reasoning in POR, 62- 64 that Armitage, in view of LeFebvre, Denny, and Provasnik, is not prior art to claims 1 and 24.

V. SECONDARY CONSIDERATIONS

PO has presented secondary considerations, and “when secondary considerations are present,... it is error not to consider them.” *ClassCo, Inc. v. Apple, Inc.*, 838 F.3d 1214, 1220 (Fed. Cir. 2016). Petitioner’s CTO *is a named inventor on the ’223 Patent* and Petitioner touted the very features Amsted patented in the Challenged Claims. POR, 64-65. This demonstrates sufficient nexus between the copying and the claims of the ’223 Patent. *Id.*

VII. CONCLUSION

For the reasons described above, the Board should find all claims of the '223 Patent patentable over the grounds cited in the petition.

Respectfully submitted,

Dated: March 8, 2024

By: /Ryan N. Miller/
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CERTIFICATION

Patent Owner's Response, excluding the caption, Table of Contents, Table of Authorities, Table of Exhibits, and this Certification contains 5,519 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: March 8, 2024

By: / Ryan N. Miller /

Ryan N. Miller
Reg. No. 68,262
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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §42.6(e), I certify that on this 8th day of March, 2024, a copy of PATENT OWNER'S SUR-REPLY 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: March 8, 2024

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