

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.

IPR2023-00540
Patent 10,137,915 B2

Before JAMES P. CALVE, KEVIN W. CHERRY, and
MICHAEL L. WOODS, *Administrative Patent Judges*.

CHERRY, *Administrative Patent Judge*.

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

I. INTRODUCTION

Hum Industrial Technology, Inc. (“Petitioner”) filed a petition to institute *inter partes* review of claims 1, 21–30, 36, and 37 of U.S. Patent No. 10,137,915 B2 (Ex. 1001, “the ’915 patent”). Paper 1 (“Pet.”). Amsted Rail Company, Inc. (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). With our authorization, Petitioner filed a Reply to Patent Owner’s Preliminary Response (Paper 7) and Patent Owner filed a Sur-Reply (Paper 9) in response to Petitioner’s Reply in order to address whether discretion is warranted under 35 U.S.C. § 325(d).

We have authority under 35 U.S.C. § 314 to determine whether to institute an *inter partes* review. The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted unless “there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” The Supreme Court has held that the Board, in a decision to institute under 35 U.S.C. § 314(b), may not institute review on less than all claims challenged in the petition. *SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1355–56 (2018). Moreover, in accordance with our rules, “[w]hen instituting *inter partes* review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.” 37 C.F.R. § 42.108(a) (2020); *see also PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018) (interpreting the statute to require “a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition”).

Applying those standards, and upon considering the Petition, the Preliminary Response, and the evidence of record, we determine the

information presented shows a reasonable likelihood that Petitioner would prevail in establishing the unpatentability of at least one of the challenged claims of the '915 patent. We also decline to exercise our discretion to deny institution under § 325(d). Accordingly, we institute an *inter partes* review of all challenged claims (i.e., claims 1, 21–30, 36, and 37) of the '915 patent, based on the grounds asserted in the Petition.

II. BACKGROUND

A. Related Matters

The parties identify the following district-court proceeding as related matters involving the '915 patent: *Amsted Rail Company, Inc. v. Hum Industrial Technology, Inc. et al*, Case No. 4:22-cv-00445-AGF (E.D. Mo.). Pet. 2; Paper 5, 1 (Patent Owner's Mandatory Notices).

Petitioner also identifies the following pending petitions for *inter partes* review involving patents that are related to the '915 patent: IPR2023-00538 (U.S. Patent No. 9,365,223 B2); IPR2023-00539 (U.S. Patent No. 9,981,673 B2). Pet. 2.

B. Real Parties in Interest

Petitioner identifies its real parties in interest as Hum Industrial Technology, Inc. and Dr. Brent Wilson. Pet. 1.

Patent Owner identifies Amsted Rail Company, Inc., Amsted Digital Solutions, Inc., and IONX LLC as its real party in interest. Paper 5, 1.

C. Overview of the '915 patent

The '915 patent is titled “System and Method for Detecting Operational Anomalies in Train Consists and Railcars.” Ex. 1001, Code [54]. The '915 patent issued from Application Serial No. 15/108,065, filed

as a PCT on Dec. 24, 2014. *Id.* at Codes [21], [22]. The '915 patent claims priority to provisional application No. 61/920,700, filed Dec. 24, 2013.

The '915 patent relates to a system and method for the real-time, on-board monitoring of various operational parameters of railcar and train consists, and for analyzing the readings in real time to predict or timely detect anomalous operational conditions. *Id.* at 1:51–55. The system include a hierarchical arrangement of components which provide a distributed data analysis capability for detecting operational anomalies at various levels of the hierarchy, and which provides for the flow of data, events and alerts to a central point. *Id.* at 1:61–65.

An illustrative embodiment of such a system is depicted in Figure 2, reproduced below.

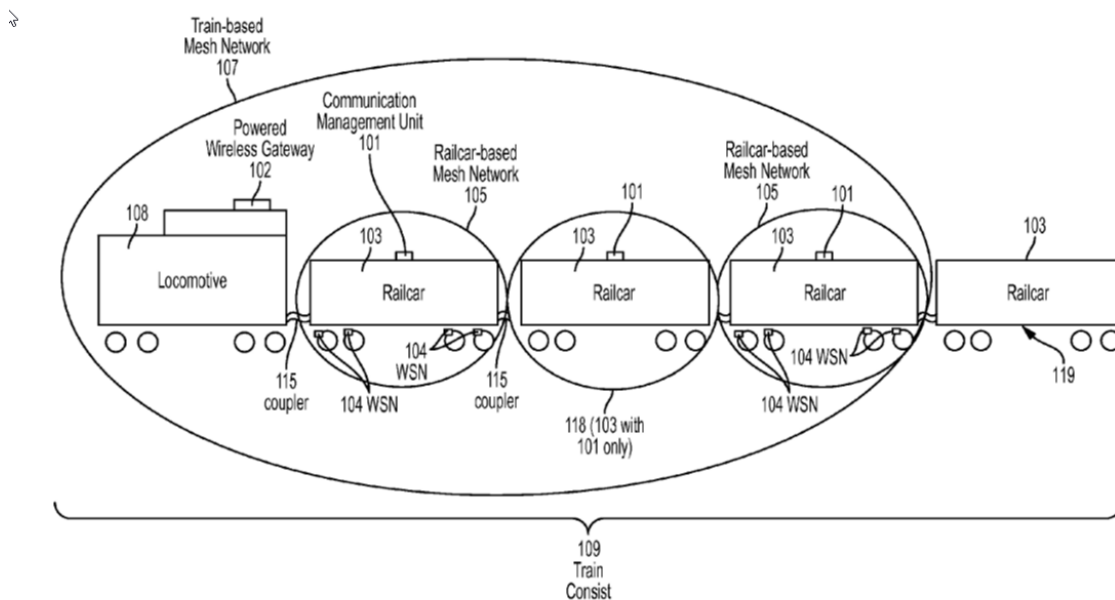


Figure 2 is a schematic of a train-based mesh network that forms train consist 109 having two railcars 103 each equipped with communication management unit (CMU) 101 and multiple wireless sensor nodes (WSNs)

104, railcar 103 without a CMU or WSN, and powered wireless gateway (PWG) device 102 installed on locomotive 108. *Id.* at 2:36–41; 3:18–20. CMU 101 includes a processor, a power source (e.g., a battery, solar cell, energy harvester, or internal power-generating capability), a global navigation satellite system (GNSS) device such as a global positioning system (GPS) receiver, Wi-Fi, satellite, and/or cellular capability, wireless communications capability for maintaining railcar-based mesh network 105, wireless communication with train-based mesh network 107 and one or more sensors 104, including, but not limited to, an accelerometer 404, gyroscope, or temperature sensor 406. *Id.* at 3:27–37. CMU 101 is capable of receiving data and/or alarms from one or more WSNs 104, processing the data received, and is capable drawing inferences from this data or alarms regarding the performance of railcar 103, and of transmitting data and alarm information to a remote receiver, such as such as a powered wireless gateway 102 (preferably located in locomotive 108), or remote railroad operations center 120. *Id.* at 4:4–13.

An illustrative embodiment of a sensor is depicted in Figure 4, reproduced below.

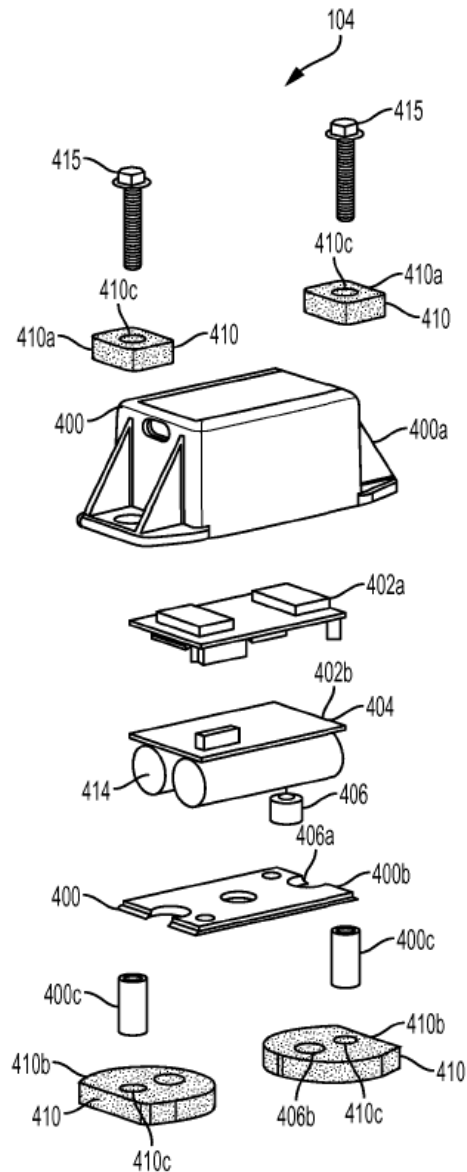


FIG. 4

Figure 4 is an exploded view of sensor node 104 which can be used, for example, for monitoring bearing temperature and wheel acceleration. *Id.* at 2:44–46. Sensor node 104 is used to detect acceleration and temperature events and is typically located on wheel bearing fitting 111 of railcar 103, and its components are contained in housing 400 having enclosure 400a and enclosure base 400b. *Id.* at 4:65–5:6. One of the components in housing

400 is mechanical filter 410 consisting of upper sections 410a and lower sections 410b that mechanically filter high and low frequency types of accelerations that are considered noise and which are preferably removed from the signal of interest. *Id.* at 5:23–27. The '915 patent explains that in one embodiment, the logic in CMU 101 is capable of analyzing both acceleration and temperature events received from each WSN 104 under its control, and determining if an alarm or event condition actually exists. *Id.* at 9:36–40. However, acceleration events are independent of temperature events, and CMU 101 may be configured to either analyze only acceleration events, or to analyze only temperature events, such that CMU 101, and WSNs 104 under its control, form a distributed event processing engine which is capable of determining various types of events. *Id.* at 9:40–46. When CMU 101 determines that an alarm or event has occurred, a message is sent to the next level in the hierarchy that is either to PWG 102 located elsewhere on train consist 109 or off train consist 109 to remote railroad operation center 120, depending upon the severity of the event and the need to immediately address the event, perhaps by altering train consist's 109 operating condition. *Id.* at 9:49–58.

D. The Challenged Claims

Petitioner challenges claims 1, 21–30, 36, and 37 of the '915 patent. Pet. 5. Of the challenged claims, claims 1, 30, and 36 are independent. Claim 1, reproduced below with Petitioner's identifiers for the claim limitations, are illustrative of the subject matter recited in the challenged claims.

- [1 Pre, 1(a)]** A system for detecting operational anomalies on a train consist or railcar comprising:
- [1(b)]** (a) one or more communication management units mounted on one or more railcars;
- [1(c)]** (b) one or more sensors located on said one or more railcars configured to sense an operational parameter of said one or more railcars, said sensors being in communication with said one or more communication management units, wherein the one or more sensors comprise one or more sensors configured to measure accelerations of the railcar; and
- [1(d)]** (c) one or more filters configured to filter at least a portion of the accelerations,
- [1(e)]** wherein said communication management units perform the functions of:
- (i) collecting data regarding said one or more railcar operational parameters;
- [1(f)]** (ii) analyzing said collected data for trends or events indicative of an anomalous operational condition; and
- [1(g)]** (iii) communicating a message to a remote receiver when said trend or event is detected.

Ex. 1001, 17:48–18:2; *see also* Pet. 21–33 (addressing claim 1 with Petitioner’s identifiers).

Independent claims 30 and 36 recite similar limitations to claim 1.

Ex. 1001, 20:39–55, 21:35–22:17.

E. Evidence

Petitioner submits the following evidence:

Evidence	Exhibit No.
Declaration of Steven Ricca	1003
LeFebvre et al., US 2007/0152107 A1 (published July 5,	1005

Evidence	Exhibit No.
2007, filed Dec. 22, 2006) (“LeFebvre”)	
Armitage et al., US 2011/0282540 A1 (published Nov. 17, 2011, filed May 11, 2011) (“Armitage”)	1006
Barone et al., US 2007/0208841 A1 (published Sept. 6, 2007, filed Jan. 19, 2007) (“Barone”)	1007
Winfree et al., US 7,706,213 B2 (issued Apr. 27, 2010, filed Oct. 23, 2007) (“Winfree”)	1008

Patent Owner submits the Declaration of Michael I. Shamos, Ph.D., in support. Ex. 2001.

F. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability:

Claim(s) Challenged	35 U.S.C. §	Reference(s)
1, 22, 24, 25, 27–30, 36, 37	103 ¹	Armitage, Barone
21	103	Armitage, Barone, LeFebvre
23, 26	103	Armitage, Barone, Winfree
1, 21, 22, 25, 27–30, 36, 37	103	LeFebvre, Barone
24, 37	103	LeFebvre, Barone, Armitage
23, 26	103	LeFebvre, Barone, Winfree

Pet. 6.

¹ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. § 103. The ’915 patent claims benefit of a Dec. 24, 2013, filing date, which is after the effective date of the applicable AIA amendments. Ex. 1001, (60).

III. PATENTABILITY ANALYSIS

Petitioner contends that claims 1, 22, 24, 25, 27–30, 36, and 37 are unpatentable under 35 U.S.C. § 103 in view of Armitage and Barone, claim 21 is unpatentable under 35 U.S.C. § 103 in view of Armitage, Barone, and LeFebvre, claims 23 and 26 are unpatentable under 35 U.S.C. § 103 in view of Armitage, Barone, and Winfree, claims 1, 21, 22, 25, 27–30, 36, and 37 are unpatentable under 35 U.S.C. § 103 in view of LeFebvre and Barone, claims 24 and 37 are unpatentable under 35 U.S.C. § 103 over LeFebvre in view of Barone and Armitage, and claims 23 and 26 are unpatentable under 35 U.S.C. § 103 over LeFebvre in view of Barone and Winfree. Pet. 6.

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

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is

² Patent Owner does not present arguments or evidence of secondary considerations in its Preliminary Response. Therefore, secondary considerations do not constitute part of our analysis herein.

unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. See *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

A. Level of Ordinary Skill in the Art

We consider the asserted grounds of unpatentability in view of the understanding of a person of ordinary skill in the art. In assessing the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (quoting *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986)). “[O]ne or more factors may predominate.” *Id.*

Relying on the declaration testimony of Mr. Ricca, Petitioner contends that an ordinarily skilled artisan for the ’915 patent “would have been a person with at least a B.S. degree in electrical or mechanical engineering or a related field with at least two years’ experience designing railcar, train, vehicle, or any other similar monitoring systems for similar industrial equipment with rotating components.” Pet. 15 (citing Ex. 1003 ¶ 45). Petitioner also contends that “[l]ess work experience may be compensated by a higher level of education, such as a master’s degree, and vice versa.” *Id.* Relying on the declaration testimony of Dr. Shamos, Patent

Owner contends that an ordinarily skilled artisan for the '915 patent would have “at least a B.S. degree in electrical or computer science or 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.” Prelim. Resp. 26 (citing Ex. 2001 ¶¶ 34–39). Patent Owner also contends that “[l]ess work experience could be compensated by a higher level of education, such as a master’s degree or doctorate degree, and vice versa.” *Id.*

Based on this record, it appears that the main distinction between Petitioner’s ordinary skilled artisan and Patent Owner’s is that Patent Owner further requires familiarity with wireless networks. We note, however, that the monitoring systems of the asserted prior art include wireless networks. In view of this, because Petitioner’s requirement of experience designing railcar, train, vehicle, or any other similar monitoring systems includes some familiarity with wireless networks, we adopt Petitioner’s articulation of the level of ordinary skill in the art, which is consistent with the '915 patent and the asserted prior art, and we apply it in our obviousness evaluations below. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (the prior art, itself, can reflect appropriate level of ordinary skill in art). We note that our decision would be the same applying either party’s definition of a person of ordinary skill in the art.

B. Claim Construction

Next, we turn to claim construction. In interpreting the claims of the '915 patent, we “us[e] the same claim construction standard that would be used to construe the claim[s] in a civil action under 35 U.S.C. [§] 282(b).” *See* 37 C.F.R. § 42.100(b) (2020). The claim construction standard

includes construing claims in accordance with the ordinary and customary meaning of such claims as would have been understood by one of ordinary skill in the art and the prosecution history pertaining to the patent. *See id.*; *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc).

Petitioner submits that no formal claim construction is necessary in this proceeding. Pet. 15. Patent Owner also asserts that no claim construction is necessary, and that each term should be given “its plain and ordinary meaning.” Prelim. Resp. 27.

Having considered the record, we determine that no express claim construction is necessary for any claim terms. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (holding that only claim terms in controversy need to be construed, and only to the extent necessary to resolve the controversy (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

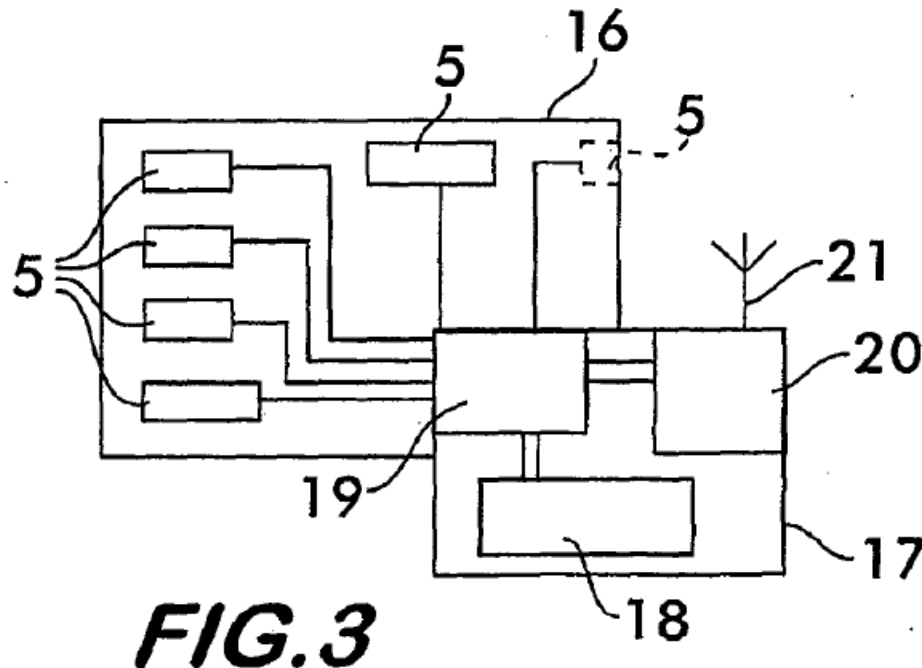
C. The Prior Art

Before turning to Petitioner’s asserted grounds of unpatentability, we provide brief summaries of the asserted references.

1. LeFebvre (Ex. 1005)

LeFebvre is entitled “Railroad Train Monitoring System.” Ex. 1005, Code [54]. LeFebvre discloses “sensors for monitoring temperature pressure, shifting loads, truck hunting and the like and have circuitry for processing information received from the sensors and for processing and reporting departures of performance variables to a remote source.” *Id.* at Code [57].

Figure 3, reproduced below, provides an illustration of an adapter pad having a plurality of sensors.



Ex. 1005, Fig. 3. Figure 3 depicts adapter pad 16 containing a plurality of sensors 5 which are embedded into its upper side and lower surfaces or into other locations such as its end surfaces. *Id.* ¶ 21. Figure 3 also depicts extended attachment portion 17, which is relatively isolated from the forces transmitted through adapter 16, and contains power source 18, analog/signal conditioning means and analog to digital conversion means and an associated microprocessor unit 19, as well as communications unit 20 which may be a low power radio transmitter/receiver having antenna 21. *Id.* The sensors are electrically connected to the analog to digital conversion circuit unit and the microprocessor unit which, in turn, is connected to and controls the communications unit so that messages can be sent and received. *Id.*

Figure 4, reproduced below provides an illustration of an adapter pad
16 *in situ*.

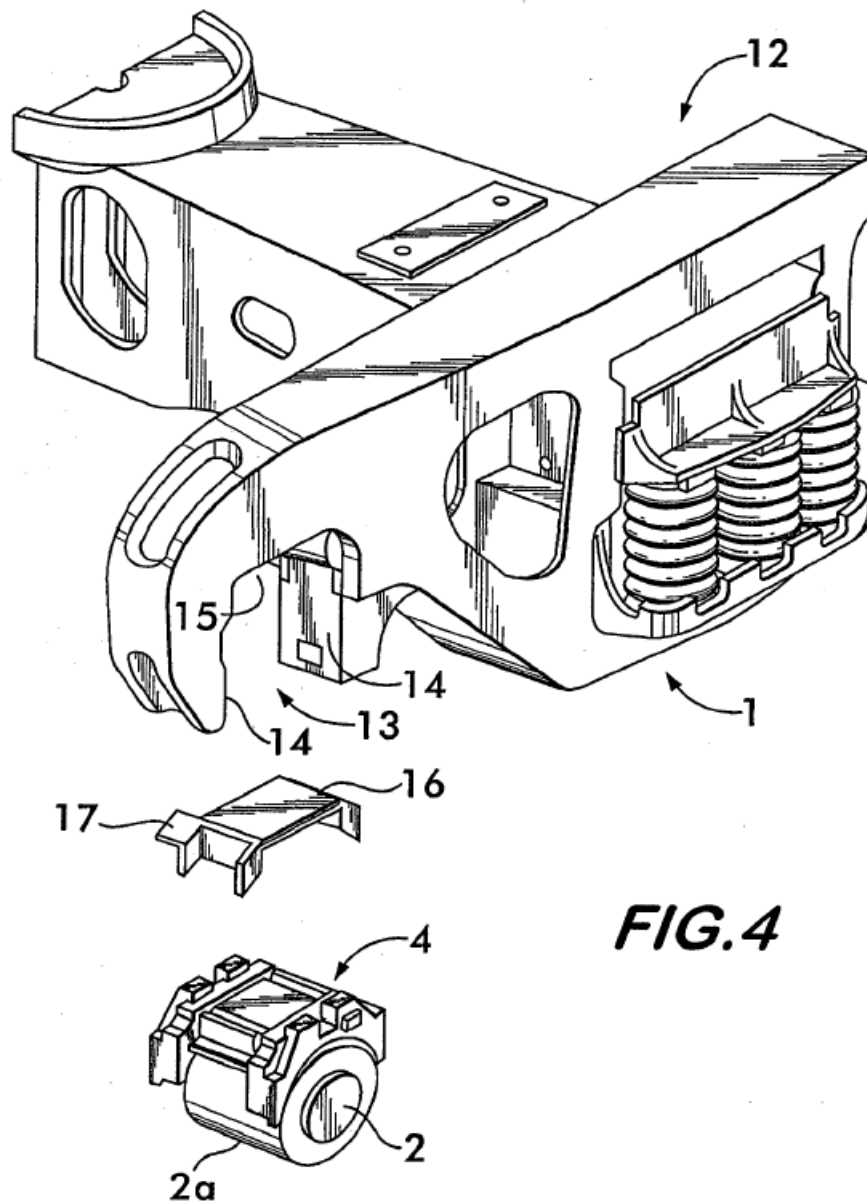


Figure 4 is an exploded perspective view of portions of a railcar truck illustrating the position of an adapter pad (instrumented pad 16) with respect to the railcar truck. *Id.* ¶ 15. As depicted in Figure 4, truck 1 having axle 2

with axle bearing 2a and bearing adapter 4, is configured so that each bearing transmits the load which it carries and heat that it may generate through pads 16 and to the truck. *Id.* ¶ 17. Bearing adapters 4 have a generally rectangular upper surface with depending legs extending from the corners of the top structure, and the legs have facing curved side surfaces which are configured to rest on the outer surface of bearing 2a mounted on the end of wheel bearing axle 2. *Id.* ¶ 19. Adapter pad 16 is generally rectangular in plan view and has depending legs, and is formed to seat upon the upper surface of adapter 4. *Id.* Railroad freight car 22 having trucks 1 with adapter/instrumented pads 16 also includes data control unit 23 having a radio/receiver which has the ability to communicate with the radios on the pads 4 on its own railcar. *Id.* ¶ 24, Fig. 1.

LeFebvre explains that wireless communication is available and adaptable to allow instrumented pads 16 and data control units 23 to establish a network of connections without external intervention. *Id.* ¶ 32. These elements can be set up to recognize the relationship of truck and axle location on a railcar or set up so that the digital communication unit is informed of the configuration, providing thereby a multi-hop means of linking the network together. *Id.* According to LeFebvre, a purpose of the invention is to be able to monitor the behavior of all the trucks and bearings and wheels on a train so that an alarm message can get through from any railcar to the locomotive or to the remote data handling service as quickly as possible. *Id.* ¶ 52. Because a large amount of data is monitored, “the system is designed to process the raw sensor data, looking for signs of trouble and then send only essential indicative information,” using a distributed inference engine, which shares the essential functions between the

microprocessors at instrumented pads 16 and at data control unit 23. *Id.*

¶ 53. Microprocessors 19 at instrumented pads 16 take a series of measurements and treat them as a time series. *Id.* ¶ 54. Then, search algorithms, forming an inference engine, can identify, for example, periodicities and cross correlations in and between time series so that any behavior detectable at pad level will be seen. *Id.* If a particular “behavior is inferred at the instrumented pad and the magnitude is sufficient to cause alarm, relevant attributes and timing (relative to the time of transmission of report) can be passed to the car’s data control unit.” *Id.* ¶ 55. LeFebvre monitors, bearing temperature, bearing condition, wheel condition, brake force or performance, and track defects, among others. *Id.* ¶¶ 57–66.

2. *Armitage (Ex. 1006)*

Armitage is entitled “Dynamic Monitoring Of Mobile Railway Car Undercarriage.” Ex. 1006, Code [54]. Armitage discloses a plurality of sensor nodes are “configured to monitor the undercarriage portion of the railway car when in motion and transmit information about the undercarriage portion to [a] control node,” which “receive[s] the information about the undercarriage portion, process[es] the information to determine a fault condition for the undercarriage portion, and wirelessly report[s] the fault condition to a collection system.” *Id.* ¶ 4.

Figure 1, reproduced below, depicts an exemplary railway car system.

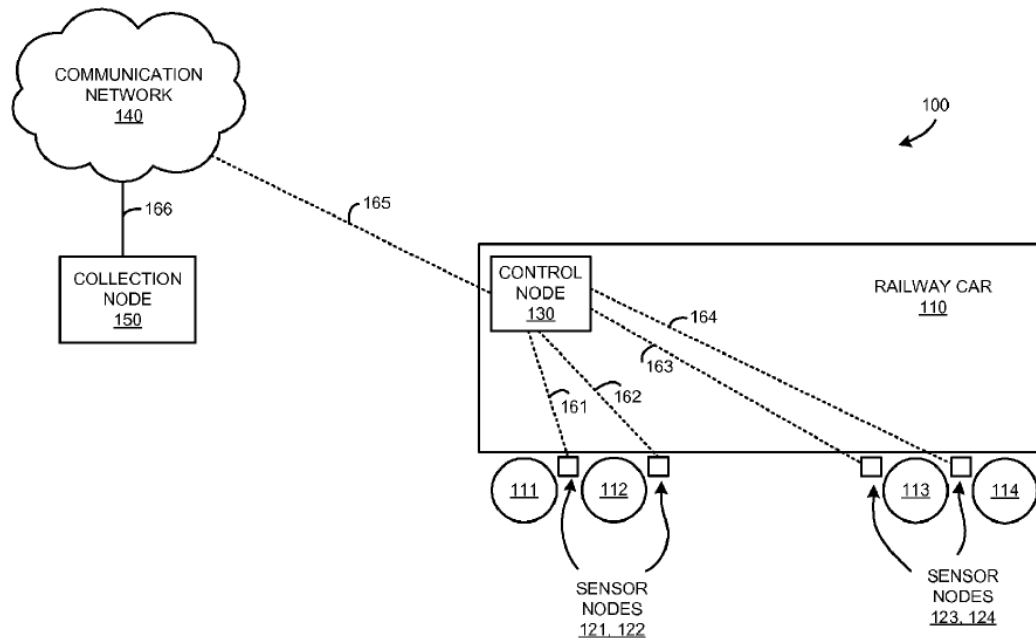


FIGURE 1

Figure 1 is a system diagram illustrating railway car monitoring system 100. System 100 includes railway car 110, undercarriage elements 111–114, sensor nodes 121–124, control node 130, communication network 140, and collection node 150. *Id.* ¶ 12. Control node 130 communicates with sensor nodes 121–124 over links 161–164 and communicates with communication network 140 over wireless link 165, and communication network 140 communicates with collection node 150 over link 166. *Id.*

Sensor nodes 121–124 each includes equipment to sense and report information about undercarriage elements of a railway car. *Id.* at 14. Each sensor node 121–124 also includes a transceiver portion for communication with control node 130, using either a wireline transceiver or using a wireless transceiver and antenna for wirelessly communicating with control node 130. *Id.* “Each of sensor nodes 121–124 could also include a processing portion for receiving the sensor information, amplifying, scaling, modifying, adjusting, digitizing, or converting the sensor information, as well as

controlling the transceiver portion and sensor portions.” *Id.* Each sensor node 121–124 also includes a power system, such as a battery or solar cell. *Id.*

Control node 130 receives information about the undercarriage portion from each of sensors 121–124 and processes the information to determine a fault condition for the undercarriage portion, which includes conditions such as wheel impact or sliding wheel conditions, and temperature. *Id.* ¶ 27. Control node 130 wirelessly reports any fault condition to collection node 150 through communication network 140. *Id.* ¶ 28. Control node 130 processes the information received from sensor nodes 121–124 over a period of time to determine a threshold for reporting the fault condition, or processes the sensor information to determine anomalies from an average, such as an anomaly from a running average of the temperature of all wheels on railway car 110. *Id.* ¶ 29.

3. *Barone (Ex. 1007)*

Barone is entitled “Self-Assembling Wireless Network, Vehicle Communications System, Railroad Wheel and Bearing Monitoring System and Methods Therefor.” Ex. 1007, Code [54]. Barone relates to “the field of wirelessly networking vehicles, especially where the vehicles are railroad cars, and where the communications are part of a system for monitoring the degree of wear on the wheel bearings of railroad cars.” *Id.* ¶ 2.

Figure 1 of Barone is reproduced below

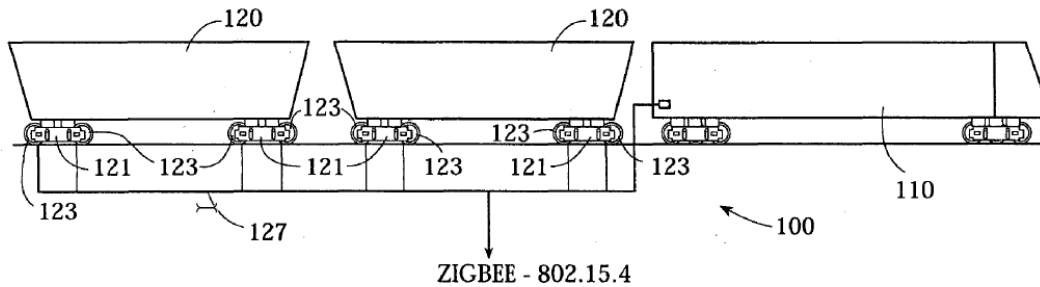


FIG. 1

Figure 1 is a schematic diagram illustrating a railroad train equipped with an exemplary network system. *Id.* ¶ 47. Network system 100 is an Autonomous Rolling Stock Monitoring System (ARMS) system used on railroad trains, where the train includes locomotive 110 and a plurality of serially connected railroad cars 120 each supported on two trucks 121 having wheels 123. *Id.* ¶ 85. The ARMS includes onboard monitoring devices that wirelessly communicate status and data to existing remote database and monitoring infrastructure. *Id.* ¶ 86. The communication system architecture includes for each wheel 123 a self-contained monitoring and diagnostic ARMS device 125 containing an IEEE 802.15.4 Zigbee wireless communication radio. *Id.*; Fig. 4A. Each wheel-mounted device or node 125, when powered, will autonomously form a network, and wirelessly transmit status and diagnostic data as required to locomotive 110, either by direct wireless communication with a Zigbee radio-equipped computer system supported on and powered by locomotive 110, or by a leap-frog or mesh network using other nodes 125 by Zigbee communications to act as intermediaries to receive and forward communications for the locomotive system. *Id.*

Data from data points that are acquired are subjected to a focused discrete Fourier transform to identify the presence of cup, cone and/or roller defect frequencies. *Id.* ¶ 201. Barone explains that the continuous monitoring of the frequencies allows for a trending analysis at the node, which provides high reliability of the bearing monitoring. *Id.* ¶ 237. A “microprocessor stores at least partial data representative of historical peak levels in dB or other units, and changes therein that exceed a pre-selected threshold trigger special processing and alarm data generation and transmission to the locomotive system.” *Id.* In one embodiment, temperature sensor 175 connects with a comparator circuit with an adaptive trip point 181 that triggers an interrupt when the temperature detected exceeds a certain preselected threshold value, and the interrupt generated by the comparator 181 is processed as a failure alarm. *Id.* ¶ 240.

4. *Winfree (Ex. 1008)*

Winfree is entitled “Mechanical Filter for Sensors.” Ex. 1008, Code [54]. Winfree relates to “protection of sensors from mechanical shock, vibration, and impact, and to the enhancement of a sensor’s response by improving its coupling to the environment.” *Id.* at 1:19–22. In particular, Winfree’s device includes one or more layers of material placed between a sensor and its environment and is used as a filter to selectively transmit, attenuate, or amplify various frequencies of incident elastic waves that would otherwise propagate from the environment and into the sensor. *Id.* at 2:24–29. In one embodiment, a single layer of material is placed between a sensor and a surface to which it is mounted in order to alter the transmission of frequencies into the sensor near some critical frequency f_c . *Id.* at 3:57–61.

D. Alleged Ground of Unpatentability Over Armitage and Barone

Petitioner contends that claims 1, 22, 24, 25, 27–30, 36, and 37 of the '915 patent are unpatentable under 35 U.S.C. § 103 as obvious over Armitage and Barone. Pet. 20–44. Patent Owner offers counterarguments. Prelim. Resp. 27–39. We have reviewed Petitioner's contentions regarding claims 1, 22, 24, 25, 27–30, 36, and 37 and determine that they show a reasonable likelihood Petitioner will prevail with respect to obviousness of claims 1, 22, 24, 25, 27–30, 36, and 37 over Armitage and Barone.

1. Claim 1

a) [1 Pre] A system for detecting operational anomalies on a train consist or railcar comprising

Petitioner contends that the preamble “states an intended use of detecting operational anomalies on a train consist or railcar,” and does not have any “patentable weight.” Pet. 21. According to Petitioner, to the extent the preamble is limiting, Armitage meets this limitation because Armitage's mobile railway car monitoring system uses sensor nodes together with a control node that “determines a fault condition, and wirelessly reports the fault condition to a collection system.” *Id.* at 22 (citing Ex. 1003 ¶ 69; Ex. 1006, Abstract, ¶¶ 3, 19, 20, 27–29, 37, 38, 48, 49). At this time, Patent Owner does not raise any arguments regarding the preamble. *See* Prelim. Resp. Thus, we find that Petitioner has shown sufficiently that Armitage accounts for the preamble, to the extent that it is limiting.

b) [1(b)] (a) one or more communication management units mounted on one or more railcars

Petitioner contends that Armitage teaches one or more “control nodes 130,” which Petitioner identifies as “a communication management unit” coupled to one or more railway cars. Pet. 23 (citing Ex. 1003 ¶ 72; Ex 1006,

Figs. 1, 3, 5, ¶¶ 4, 12, 14, 17, 20, 26, 36, 38). At this time Patent Owner does not raise any arguments regarding this limitation. *See* Prelim. Resp. Thus, we find that Petitioner has shown sufficiently that Armitage accounts for this limitation.

- c) [1(c)] (b) one or more sensors located on said one or more railcars configured to sense an operational parameter of said one or more railcars, said sensors being in communication with said one or more communication management units, wherein the one or more sensors comprise one or more sensors configured to measure accelerations of the railcar*

Petitioner argues that “Armitage teaches a plurality of ‘sensors nodes 121-124’ located on one or more railway cars, which contain a ‘sensor portion’ and is configured to sense operational parameters of one or more railcars.” Pet. 23–24 (citing Ex. 1003 ¶ 73; Ex. 1006, Figs. 1, 3, 5, ¶¶ 4, 12, 14). Petitioner asserts that “Armitage’s system also includes a ‘control node’ on each railcar,” and “[t]he control node receives ‘sensor information, or modified sensor information’ collected by each of the sensor nodes on the same railcar.” *Id.* at 24 (citing Ex. 1006 ¶¶ 14, 12, 27, Figs. 1, 3, 5; Ex. 1003 ¶ 74). Petitioner contends that “[t]he sensor nodes and the control node communicate over a wireless network,” and “[t]he sensor portion of the ‘sensor nodes 121–124’ in Armitage can be accelerometers for measuring accelerations.” *Id.* at 24–25 (citing Ex. 1003 ¶ 74; Ex. 1006 ¶¶ 4, 21, 33, 45, 46, 56, Figs. 1, 3, 5). At this time Patent Owner does not raise any arguments regarding this limitation. *See* Prelim. Resp. Thus, we find that Petitioner has shown sufficiently that Armitage accounts for this limitation.

d) [1(d)] (c) one or more filters configured to filter at least a portion of the accelerations

Petitioner argues that Armitage meets limitation [1(d)] for several reasons, including because Armitage’s sampling of accelerometer data at the CMU level is equivalent to the claimed “filtering at least a portion of the accelerations.” Pet. 25 (citing Ex. 1003 ¶ 76; Ex. 1006 ¶ 45). In particular, Petitioner argues that “Armitage teaches sampling accelerations for only a portion of a wheel rotation, and filters out radial accelerations.” *Id.* (citing Ex. 1006 ¶¶ 45–46). According to Petitioner, an ordinary artisan “would understand Armitage’s teachings of sampling data and ignoring radial accelerations equates to filtering at least a portion of accelerations.” *Id.* at 26 (citing Ex. 1003 ¶ 76).

Petitioner also argues that Armitage filters at the sensor level because Armitage’s “sensor 630” can include “amplifiers, analog-to-digital-converters, [and] microcontrollers,” and an ordinary artisan would understand that inclusion of these components “in the sensor would mean the sensor is capable of filtering at least a portion of accelerations.” *Id.* (citing Ex. 1003 ¶ 77). According to Petitioner, because “filtering is excluding some portion of a data set,” an ordinary artisan “would understand Armitage’s teachings of sampling and ignoring certain data points equates to filtering data.” *Id.* at 26–27 (citing Ex. 1003 ¶¶ 78–79).

Petitioner asserts that to the extent Armitage’s “sampling and ignoring data” is not filtering, Barone shows filtering acceleration data was known and used in the art because Barone “teaches output of an ‘accelerometer 171’ being transmitted to ‘signal conditioning 178’, where the analog signals are amplified and/or filtered as appropriate.” *Id.* at 27 (citing Ex. 1003 ¶ 80; Ex. 1006 ¶¶ 114–115, 150, 172–185, Fig. 8). Petitioner asserts that “Barone

further teaches the use of a high-pass, low-pass, and/or band-pass filters, all of which can utilize both electronic and digital filters.” *Id.* at 28 (citing Ex. 1003 ¶ 81; Ex. 1007 ¶¶ 172–185). According to Petitioner, an ordinary artisan “would be motivated to include the filtering taught by Barone to remove unwanted data and/or amplify particularly relevant accelerations data.” *Id.* (citing Ex. 1003 ¶ 81).

Patent Owner argues that neither Armitage nor Barone teaches or suggests this limitation. Prelim. Resp. 28–36. With respect to Armitage, Patent Owner asserts that “Petitioner and its expert are simply wrong to equate sampling—which Petitioner admits occurs only ‘for a portion of a wheel rotation’—with filtering.” *Id.* at 29. Patent Owner contends that a person of ordinary skill in the art “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.” *Id.* (citing Ex. 2001 ¶ 44). Patent Owner asserts that “[o]btaining data though sampling—at different intervals—is a distinct concept from filtering data.” *Id.* (citing Ex. 2001 ¶¶ 44–49). Patent Owner submits that “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.” *Id.* at 31 (citing Ex. 2001 ¶¶ 43–52).

On this record, we agree with Patent Owner that merely sampling data, as taught in Armitage, is not the claimed filtering. As explained by Patent Owner, “[o]btaining data though sampling—at different intervals—is a distinct concept from filtering data.” *See* Prelim. Resp. 29 (citing Ex. 2001 ¶¶ 44–49). This distinction between “sampling” and “filtering” appears to

be supported by Barone, which draws the same distinction. *See* Ex. 1007 ¶ 150. Thus, on this record, we find Petitioner has not shown that Armitage accounts for this limitation.

As for Barone, Patent Owner argues that “all Barone does is precondition an analog signal and does so by preserving acceleration data.” *Id.* at 31–32 (citing Ex. 2001 ¶¶ 35–59). Patent Owner asserts that “no acceleration data is filtered out of the *R* signal . . . [t]he signal conditioner 178 simply removes unwanted noise from the analog signal *R* prior to converting to a digital signal *S*.” *Id.* at 33.

We agree with Petitioner, however, that Barone accounts for the claimed “filtering” and that it would have been obvious to apply Barone’s filtering to Armitage’s system for the purpose of removing unwanted data or amplifying relevant accelerations data. *See* Pet. 28 (citing Ex. 1003 ¶ 81). There is no dispute that Barone discloses filtering generally.³ Patent Owner’s argument instead is that “one or more filters configured to filter at least a portion of the accelerations” does not include filtering of noise from the signal received from the acceleration sensors. Prelim. Resp. 30–31. On this record, we disagree. Claim 26, which depends from claim 1, recites “wherein the one or more filters comprise one or more mechanical filters.” Ex. 1001, 20:31–32. Thus, claim 1 appears to be broad enough to include “mechanical filters.” *See Baxalta Inc. v. Genentech, Inc.*, 972 F.3d 1341, 1346 (Fed. Cir. 2020) (“The district court’s construction [of the independent claim] which excludes these explicitly claimed embodiments [in the

³ Patent Owner disputes Petitioner’s reasoning for combining Barone’s filter with Armitage. *See* Prelim. Resp. 38–39. We address Patent Owner’s arguments below. *See infra* § III.D.1.h.

dependent claims] is inconsistent with the plain language of the claims.”). The Specification states that “mechanical filter 410 . . . serve to mechanically filter high and low frequency types of accelerations that are considered noise and which are preferably removed from the signal of interest.” Ex. 1001, 5:23–27. Thus, on this record, we do not agree with Patent Owner that Barone’s filtering of noise falls outside the scope of the claimed filtering. Accordingly, we find that Petitioner has shown a reasonable likelihood that the combination accounts for limitation [1(d)].

e) wherein said communication management units perform the functions of: (i) collecting data regarding said one or more railcar operational parameters

Petitioner argues that “Armitage teaches a ‘control node[s] 130’ which collects data from a plurality of sensors on the railcar regarding one or more railcar operational parameters,” and “each sensor node contains one or more sensors that collect data regarding the railcar, and wirelessly transmits the collected data to the ‘control node 130.’” Pet. 30 (citing Ex. 1003 ¶¶ 84, 85; Ex. 1006 ¶¶ 12, 20). Petitioner asserts that “[t]he ‘control node 130’ collects this data and analyzes it to determine whether a fault condition is present,” and “[i]f a fault condition is detected, the ‘control node 130’ wirelessly reports it (i.e., sends an alarm message) to a collection system.” *Id.* (citing Ex. 1006 ¶¶ 27, 28; Ex. 1003 ¶ 85). At this time Patent Owner does not raise any arguments regarding this limitation. *See* Prelim. Resp. Thus, we find that Petitioner has shown sufficiently that Armitage accounts for this limitation.

f) (ii) analyzing said collected data for trends or events indicative of an anomalous operational condition

Petitioner argues that “Armitage teaches a ‘control node 130’ (i.e., CMU), which can include ‘user interface systems, memory devices, computer-readable storage mediums, software, processing circuitry’ for analyzing data.” Pet. 30–31 (citing Ex. 1003 ¶ 86; Ex. 1006 ¶ 16). Petitioner asserts that “Armitage teaches the ‘control node[s] 130’ analyzes the collected data for trends or events indicative of an anomalous operational condition.” *Id.* at 31 (citing Ex. 1003 ¶ 86; Ex. 1006 ¶¶ 16, 40). Petitioner notes that “[t]he control node can also perform statistical analysis on the collected data to detect failure conditions, such that it is ‘drawing inferences’ regarding the performance of the railcar.” *Id.* (citing Ex. 1003 ¶ 87; Ex. 1006 ¶ 42). Petitioner asserts that “[t]he control node can ‘process the sensor information to determine anomalies from an average, such as an anomaly from a running average of the temperature of all wheels on a railway car.’” *Id.* at 32 (citing Ex. 1006 ¶ 29). Petitioner argues that “Armitage also discloses the use of a ‘moving average and trend analysis’ to detect ‘statistically significant deviations’ that are indicative of failure,” and “Armitage indicates its system can distinguish between potential failures (which warrant maintenance) and actual failures (which require immediate service).” *Id.* (citing Ex. 1006 ¶¶ 30, 44, 45; Ex. 1003 ¶ 88). At this time Patent Owner does not raise any arguments regarding this limitation. *See* Prelim. Resp. Thus, we find that Petitioner has shown sufficiently that Armitage accounts for this limitation.

g) (iii) communicating a message to a remote receiver when said trend or event is detected

Petitioner contends that Armitage discloses the control node on each railcar (i.e., communication management unit) wirelessly transmits information, such as sensor data and alarm messages, to a collection node (i.e., a base unit). Pet. 32 (citing Ex. 1003 ¶ 89; Ex. 1006 ¶¶ 4, 19–20, 38, Fig. 1). Petitioner submits that “[i]n Armitage’s system, if the control node detects a fault condition, it wirelessly reports the fault (i.e., sends an alarm message),” and “Armitage further discloses the collection node can be in a remote location located off the train (i.e., remote).” *Id.* at 32–33 (citing Ex. 1006 ¶¶ 28, 39, Fig. 2; Ex. 1003 ¶¶ 89, 90). At this time Patent Owner does not raise any arguments regarding this limitation. *See* Prelim. Resp. Thus, we find that Petitioner has shown sufficiently that Armitage accounts for this limitation.

h) Motivation to Combine and Teaching Away

Patent Owner argues that “Petitioner does not provide any evidence to support its assertion that a [person of ordinary skill in the art] ‘would have been motivated to include the filtering taught by Barone’ beyond the conclusory, mirror image statements of its expert.” Prelim. Resp. 38. Patent Owner also argues that Barone “expressly criticizes other data analysis techniques.” *Id.* at 38–39 (citing Ex. 1007 ¶ 151).

A motivation to combine may be found “explicitly or implicitly in market forces; design incentives; the ‘interrelated teachings of multiple patents’; ‘any need or problem known in the field of endeavor at the time of invention and addressed by the patent’; and the background knowledge, creativity, and common sense of the person of ordinary skill.” *ZUP, LLC v. Nash Mfg., Inc.*, 896 F.3d 1365, 1371 (Fed. Cir. 2018) (quoting *Plantronics*,

Inc. v. Aliph, Inc., 724 F.3d 1343, 1354 (Fed. Cir. 2013)). “The motivation-to-combine analysis is a flexible one.” *Intel Corp. v. PACTXPP Schweiz AG*, 61 F.4th 1373, 1379 (Fed. Cir. 2023). And “[a] person of ordinary skill is also a person of ordinary creativity, not an automaton.” *KSR*, 550 U.S. at 421.

Petitioner explains that Armitage and Barone are in the same field of endeavor, describe similar devices with similar components and a common goal of determining anomalous conditions of a rail car. Pet. 20. Petitioner submits that to the extent Armitage does not disclose filtering, a person of ordinary skill would have been motivated to include the filter 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 systems is to analyze data in a train monitoring system to accurately predict anomalous conditions and avoid false or inaccurate data processing.” *Id.* at 21 (citing Ex. 1003 ¶ 67). Petitioner contends that “[c]ombining 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.” *Id.*

“There is a motivation to combine when a known technique ‘has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way,’ using the ‘prior art elements according to their established functions.’” *PACTXPP*, 61 F.4th at 1380–81. That is the case here. As Petitioner explains, Armitage and Barone are similar devices, the filter of Barone has been used to improve Barone’s device by allowing the removal of unwanted data from the sensors, and this technique could be predictably applied to Armitage’s

device, as well, with the benefit of improving data processing. Ex. 1003 ¶¶ 66–67. On this record, we find this reasoning, supported by the teachings of the references and Mr. Ricca’s testimony, sufficient to show a motivation to combine.

Patent Owner also argues that Barone teaches away because it allegedly criticizes other data analysis techniques. *See* Prelim. Resp. 38–39 (citing Ex. 1007 ¶ 151). Specifically, Patent Owner points to the statement in Barone that “[t]hese processes result in improved power efficiency relative to more computation intensive algorithms used in the prior art, where power is not a significant concern.” Ex. 1007 ¶ 151.

“A reference teaches away ‘when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken’ in the claim.” *Meiresonne v. Google, Inc.*, 849 F.3d 1379, 1382 (Fed. Cir. 2017). “A reference that ‘merely expresses a general preference for an alternative invention but does not criticize, discredit, or otherwise discourage investigation into’ the claimed invention does not teach away.” *Id.* On this record, we are not persuaded that this is a teaching away for several reasons. First, the combination seeks to improve the operation of Armitage by incorporating Barone’s filter, not altering Barone. Thus, it is unclear how this alleged teaching away in Barone would discourage a person of ordinary skill from modifying *Armitage*. Second, on this record, we understand the statement as expressing a preference, and does not rise to the level of a teaching away. Thus, we are not persuaded that Barone teaches away from the combination.

Accordingly, we find, on the current record, that Petitioner has shown sufficiently that a person of ordinary skill in the art would have been motivated to combine Armitage with Barone.

i) Summary as to Claim 1

We find that Petitioner has shown a reasonable likelihood that the combination accounts for the limitations of claim 1, and that a person of ordinary skill would have been motivated to combine Armitage and Barone with a reasonable expectation of success. Accordingly, we find that Petitioner has shown a reasonable likelihood of showing that claim 1 would have been obvious over the combination of Armitage and Barone.

2. Claim 30

Claim 30 is an independent claim reciting a “method for detecting operational anomalies on a train consist or railcar.” Ex. 1001, 20:39–55. Claim 30 recites method steps corresponding to the limitations of system claim 1. *Compare id.* (claim 30), with *id.* at 17:48–18:2 (claim 1). Petitioner provides a detailed mapping, supported by the testimony of Mr. Ricca, for how the combination of Armitage and Barone accounts for the limitations of claim 30. *See* Pet. 21–33, 38–39. Patent Owner repeats its argument that neither Armitage nor Barone teaches the “filtering, by one or more filters, at least a portion of the accelerations” that was considered above with respect to claim 1. *See* Prelim. Resp. 35–37. For reasons set forth above, we do not, on this record, find Patent Owner’s argument persuasive. *See supra* III.D.1.d. We have reviewed Petitioner’s evidence and argument and, at this stage, we find it sufficient. Accordingly, we find that Petitioner has shown a reasonable likelihood that claim 30 would have been unpatentable as obvious over Armitage and Barone.

3. *Claim 36*

Claim 36 is an independent claim reciting a “system for detecting operational anomalies on a railcar that is part of a train consist.” Ex. 1001, 21:35–22:17. Claim 36 recites limitations almost identical to claim 1. *Compare id.* (claim 36), with *id.* at 17:48–18:2 (claim 1). Petitioner provides a detailed mapping, supported by the testimony of Mr. Ricca, for how the combination of Armitage and Barone accounts for the limitations of claim 36. *See* Pet. 21–33, 39–40. There is one limitation of claim 36 that does significantly differ—“drawing inferences from the data received from at least two of the sensors regarding the performance of the railcar” (as compared to “analyzing said collected data for trends or events indicative of an anomalous operational condition” of claim 1). However, Petitioner discusses this limitation in detail in its Petition. *See* Pet. 30–32. Patent Owner repeats its argument that neither Armitage nor Barone teaches the “filtering, by one or more filters, at least a portion of the accelerations” that was considered above with respect to claim 1. *See* Prelim. Resp. 37–38. For reasons set forth above, we do not, on this record, find Patent Owner’s argument persuasive. *See supra* III.D.1.d. We have reviewed Petitioner’s evidence and argument and, at this stage, we find it sufficient. Accordingly, we find that Petitioner has shown a reasonable likelihood that claim 36 would have been unpatentable as obvious over Armitage and Barone.

4. *Remaining Claims*

Petitioner provides a detailed mapping for how the combination of Armitage and Barone accounts for the limitations of claims 22, 24, 25, 27, 28, and 37. Pet. 34–38, 40–44. At this stage of the proceeding, Patent Owner does not raise any arguments regarding these claims beside the

arguments considered above with respect to claims 1, 30, and 36. We have reviewed Petitioner's evidence and argument and, at this stage, we find it sufficient. Accordingly, we find that, on the current record, Petitioner has shown a reasonable likelihood of prevailing in showing that claims 22, 24, 25, 27, 28, and 37 would have been obvious over the combination of Armitage and Barone.

5. Summary

Accordingly, for the reasons set forth above, we find that Petitioner has shown a reasonable likelihood of prevailing in showing that claims 1, 22, 24, 25, 27–30, 36, and 37 would have been obvious over Armitage and Barone.

E. Alleged Ground of Unpatentability Over Armitage, Barone, and LeFebvre

Petitioner contends that claim 21 of the '915 patent is unpatentable under 35 U.S.C. § 103 as obvious over Armitage, Barone, and LeFebvre. Pet. 44–45. At this time, Patent Owner offers no counterarguments beyond those considered above with respect to claim 1. Prelim. Resp. 39. We have reviewed Petitioner's contentions regarding claim 21 and determine that they show a reasonable likelihood Petitioner will prevail with respect to obviousness of claim 21 over Armitage, Barone, and LeFebvre.

F. Alleged Ground of Unpatentability Over Armitage, Barone, and Winfree

Petitioner contends that claims 23 and 26 of the '915 patent are unpatentable under 35 U.S.C. § 103 as obvious over Armitage, Barone, and Winfree. Pet. 45–49. At this time, Patent Owner offers no

counterarguments beyond those considered above with respect to claim 1. Prelim. Resp. 39. We have reviewed Petitioner’s contentions regarding claims 23 and 26 and determine that they show a reasonable likelihood Petitioner will prevail with respect to obviousness of claims 23 and 26 over Armitage, Barone, and Winfree.

G. Alleged Ground of Unpatentability Over LeFebvre and Barone

Petitioner contends that claims 1, 21, 22, 25, 27–30, 36, and 37 of the ’915 patent are unpatentable under 35 U.S.C. § 103 as obvious over LeFebvre and Barone. Pet. 49–72. At this time, Patent Owner only disputes whether the combination discloses the claimed “filters” discussed above. See Prelim. Resp. 39–43. As we explained in detail above, we find that Barone satisfies the claimed “filters.” See *supra* III.D.1.d. Having considered the arguments and evidence before us, we determine that the record establishes a reasonable likelihood that Petitioner would prevail in showing claims 1, 21, 22, 25, 27–30, 36, and 37 would have been obvious over LeFebvre and Barone.

H. Alleged Ground of Unpatentability Over LeFebvre, Barone, and Armitage

Petitioner contends that claims 24 and 37 of the ’223 patent are unpatentable under 35 U.S.C. § 103 as obvious over LeFebvre, Barone, and Armitage. Pet. 72–77. At this time, Patent Owner offers no counterarguments beyond those considered above with respect to claims 1 and 36. Prelim. Resp. 44. We have reviewed Petitioner’s contentions regarding claims 24 and 37 and determine that they show a reasonable

likelihood Petitioner will prevail with respect to obviousness of claims 24 and 37 over LeFebvre, Barone, and Armitage.

I. Alleged Ground of Unpatentability Over LeFebvre, Barone, and Winfree

Petitioner contends that claims 23 and 26 of the '915 patent are unpatentable under 35 U.S.C. § 103 as obvious over LeFebvre, Barone, and Winfree. Pet. 77–80. At this time, Patent Owner offers no counterarguments beyond those considered above with respect to claim 1. Prelim. Resp. 44. We have reviewed Petitioner's contentions regarding claims 23 and 26 and determine that they show a reasonable likelihood Petitioner will prevail with respect to obviousness of claims 23 and 26 over LeFebvre, Barone, and Winfree.

J. "Correct" Constructions

Patent Owner argues that the Petition should be denied because "Petitioner fails to proffer, much less analyze the claim under, what it contends is the correct construction." Prelim. Resp. 11. Patent Owner asserts that Petitioner's position that "no formal construction is necessary in this proceeding" is "inconsistent with positions Petitioner has taken in the on-going district court litigation." *Id.* at 12. We disagree that Petitioner's failure to use the same claim construction in this proceeding as it offered, but has not been yet adopted, in the district court requires denying the Petition. *See, e.g., Abbott Diabetes Care Inc. v. Dexcom, Inc.*, IPR2022-00913, Paper 14 at 11–17 (PTAB Nov. 3, 2022) (explaining that there is no requirement that a party present the same construction before the Board and the district court).

K. Mr. Ricca's Testimony

Patent Owner asserts that “the Petition is nothing but conclusory and unsupported attorney argument and institution should be denied,” because “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.” Prelim. Resp. 19. *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 15–17 (PTAB Aug. 24, 2022) (precedential) (according “little weight” to declaration testimony that contains a *verbatim* restatement of a petition’s arguments without additional supporting evidence or reasoning). *Id.* at 14.

We disagree. The Petition cites Mr. Ricca’s testimony as evidence to support contentions in the Petition. Any overlap or similarity would appear to result from the Petition citing Mr. Ricca’s Declaration without any deviation from the matters to which Mr. Ricca testifies. Mr. Ricca supports his testimony by citing record evidence as indicated by examples cited in the Preliminary Response. *See* Prelim. Resp. 14–19; *see Xerox*, Paper 9 at 15 (the critical inquiry is whether a declaration is conclusory and unsupported and whether it discloses underlying facts or data on which the opinion is based) (quoting 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.”)). If declaration testimony is supported sufficiently and, in turn, supports contentions in the Petition, we do not give it little to no weight simply because it is repeated in the Petition.

L. Impermissible Cross-Referencing

Patent Owner asserts that the Petition “fails to identify with particularity the grounds and supporting evidence for its challenge on a claim-by-claim basis,” because the analysis of claims 26, 27, 28, 29, 30, and 36 “consists entirely of internal cross-references to its prior analysis of other, different claims with different claim language or limitations.” Prelim. Resp. 19 (citing Pet. 38–40, 49, 66–68, 73–75, 80). We do not find the cross referencing used by Petitioner to be impermissible. Although Patent Owner contends that there are differences in the claim language, it does not identify, nor do we discern on the current record, any differences between the claims that are significant to our patentability analysis.

IV. DISCRETION UNDER 35 U.S.C. § 325(d)

A. Prosecution History

The '915 patent was filed as a PCT application on Dec. 24, 2014, claiming priority to a provisional application filed on Dec. 24, 2013. Ex. 1001, Codes [22], [60]. On June 24, 2016, the applicants filed an Information Disclosure Sheet (“IDS”). Ex. 1002, 211–16. The IDS included 19 U.S. patents (including U.S. Patent No. 7,688,218 B2 (“the '218 patent”), which was the issued version of LeFebvre (Ex. 1005)), 9 U.S. patent publications (including Armitage), and 9 foreign patents and publications. *Id.* They were initialed as considered by the Examiner. *See id.* at 487–91. On November 1, 2017, the Examiner issued an Office Action. *Id.* at 494. Out of the 65 pending claims, the Examiner rejected claims 1–50, 54, and 60–65, and objected to claims 51–53 and 55. *Id.* at 495. The Examiner rejected claims 1–30, 33–44, 46, 48–50, 54, and 60–65, under 35

U.S.C. § 102(a)(1) as anticipated by LeFebvre.⁴ *Id.* at 496–514. The Examiner also rejected claims 31, 32, 45, and 47 as unpatentable as obvious under 35 U.S.C. § 103 in view of LeFebvre and Brown (U.S. Patent Publication 2009/0173840 A1). *Id.* at 514–17. The Examiner noted that dependent claims 51–53 and 55 were allowable if rewritten in independent form. *Id.* at 517.

On March 29, 2018, the applicants submitted a Response to the Office Action amending some claims, canceling some claims, and adding six new claims. *See id.* at 531–44. The applicants amended independent claim 1 to add the limitations “wherein the one or more sensors comprise one or more sensors configured to measure the accelerations of the railcar” and “one or more filters configured to filter at least a portion of the accelerations.” *Id.* at 531. The applicants added similar limitations to the other pending independent claims. *See id.* at 537, 542. The applicants argued that the claims were allowable because LeFebvre “fails to teach or suggest ‘one or more filters configured to filter at least a portion of’ ‘accelerations of the railcar.’” *Id.* at 528.

On May 10, 2018, the Examiner issued a Notice of Allowability. *Id.* at 550. The Examiner did not provide any reasons for the allowance. *Id.* at 550–51. On August 8, 2018, the applicants filed a Request for Continued Examination. *Id.* at 562. The Request enclosed an IDS enclosing 2 Japanese patent documents, including JP2009-210301⁵ (along with a machine translation), and a Japanese Office Action and translation of the

⁴ The Examiner’s rejection was based on the ’218 patent, the issued patent of LeFebvre (Ex. 1005).

⁵ JP2009-210301 to NSK Ltd., published Sept. 17, 2009 (Ex. 1002, 570–86 (Japanese original), 601–21 (machine translation)).

Office Action. *Id.* at 568. On September 6, 2018, the Examiner issued a second Notice of Allowability, no reasons for allowance were provided.⁶ *Id.* at 628–31. On October 10, 2018, the applicants filed an additional IDS with a Chinese non-patent reference and an office action from the Chinese office action. *Id.* at 652–54. The ’915 patent issued on November 27, 2018.

B. Legal Framework

35 U.S.C. § 325 deals with the relation of proceedings before the Board with other proceedings. 35 U.S.C. § 325(d) provides that “[i]n determining whether to institute or order a proceeding under this chapter, chapter 30, or chapter 31,^[7] the Director may take into account whether, and reject the petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office.” In evaluating arguments under § 325(d), we use

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

Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential).

Advanced Bionics states that “[p]reviously presented art . . . includes art provided to the Office by an applicant, such as on an Information Disclosure

⁶ The Examiner issued two corrected Notices of Allowability to correct claim listings. *See* Ex. 1002, 644–51.

⁷ Chapter 31 (35 U.S.C. §§ 311–319) relates to *inter partes* review.

Statement (IDS), in the prosecution history of the challenged patent” and that “[t]he proceedings in which art was previously presented include . . . examination of the underlying patent application . . . and AIA post-grant proceedings involving the challenged patent.” *Advanced Bionics*, IPR2019-01469, Paper 6 at 7–8.

To determine whether the Petition presents “the same or substantially the same” art or arguments previously presented to the Office, we consider the factors set forth in *Becton, Dickinson*.⁸ *Id.* at 7 n.8. *Becton, Dickinson* provides a non-exclusive set of factors to use in applying the framework of 35 U.S.C. § 325(d).

Under *Becton, Dickinson*, we consider:

(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; (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.

See Becton, Dickinson, Paper 8 at 17–18.

In assessing the similarity of the prior art and arguments presented to the Office in examination and reexamination, we consider *Becton, Dickinson* factors (a), (b), and (d). If, after our review of factors (a), (b), and (d), we

⁸ *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 (Dec. 15, 2017) (precedential as to § III.C.5, first paragraph) (“*Becton, Dickinson*”).

determine that the same or substantially the same prior art or arguments previously were presented to the Office, we consider factors (c), (e), and (f) to determine whether Petitioner has demonstrated material error by the Office. *Advanced Bionics*, IPR2019-01469, Paper 6 at 10.

C. Analysis

1. Whether Petitioner Relies on the Same or Substantially the Same Art

Patent Owner argues that LeFebvre and Armitage were previously considered by the Examiner during the prosecution of the '915 patent, because they were both cited on an IDS which was signed and dated by the Examiner. Prelim. Resp. 5–6 (citing Ex. 1002, 211–216, 487–491). Patent Owner also notes that LeFebvre was used by the Examiner to reject the pending claims during the prosecution. *Id.* As to Barone and Winfree, Patent Owner asserts that the Examiner considered Negoro,⁹ Searle,¹⁰ and JP 2009/210301 with respect to accelerometer sensors and filters that filter a portion of the acceleration. *Id.* at 7 (citing Ex. 1002, 360, 450, 601). As for the second prong, Patent Owner submits that Petitioner failed to show an error by Examiner. *Id.* at 9–11.

We decline to exercise our discretion to deny institution. We begin by noting that neither Barone nor Winfree was before the Examiner. We also find that they are not cumulative of Negoro, Searle, or JP 2009/210301. Barone, in particular, presents a similar system to LeFebvre and Armitage that includes filtering. Patent Owner admits that Negoro only discloses the

⁹ Negoro et al., JP 08-015099, Published Jan. 19, 1996 (“Negoro”).

¹⁰ Searle et al., WO 2005/105536 A1, Published Nov. 10, 2005 (“Searle”).

use of accelerometers to measure vibration, *see* Prelim. Resp. 7, which we find does not overlap with the teachings of Barone regarding filtering. As for Searle, Patent Owner contends that it discloses “accelerometers to measure vibration that have outputs that are ‘low-pass filtered’ and compared against an alarm level.” *Id.* We disagree that this is cumulative of Barone’s extensive teachings regarding filtering that we discussed above. Moreover, Searle discloses a different topology that lacks a central management unit of the claims. *See* Ex. 1002, 447 (discussing Searle’s disclosure of its topology). As for JP2009-210301 (“NSK”), Patent Owner argues that it discloses “a low pass filter for attenuating a frequency component of the output.” Prelim. Resp. 7 (citing Ex. 1002, 600). Given the limited explanation of Patent Owner, we find that it does not appear to have as extensive or detailed discussion of filtering and the architecture of the system as Barone, so we are not persuaded that Barone is cumulative to NSK.

The parties agree that Information Disclosure Statements (IDSs) filed during prosecution of the ’915 patent cited LeFebvre and Armitage. Pet. 16–17; Prelim. Resp. 14–17. Petitioner also acknowledges that LeFebvre was considered during the prosecution of the ’915 patent. Pet. 17. Under our controlling precedent, both references are considered to be “previously presented” to the Office. *Advanced Bionics*, IPR2019-01469, Paper 6 at 7–8 (“Previously presented art includes art made of record by the Examiner, and art provided to the Office by an applicant, such as on an [IDS], in the prosecution history of the challenged patent.”).

2. *Whether Petitioner Demonstrates Office Material Error*

Because the same prior art previously was presented to the Office, we consider *Becton Dickinson* factors (c), (e), and (f) to determine whether Petitioner has demonstrated material error by the Office. Although Armitage were presented to the Office, and the Examiner indicated on IDSs that it was considered, it was not used in a rejection of any claims of the '915 patent application as both parties recognize. Pet. 17; *cf.* Prelim. Resp. 5–6.

Armitage was cited with 19 U.S. patents, 9 published applications, and 9 foreign patents. Ex. 1002, 487–490. We note that although the Examiner initialed the IDS listing Armitage, that IDS also cites almost 37 other references. Moreover, we note that the Examiner did not use Armitage to reject any claims of the '915 patent application. We find these facts in combination with the fact that the Examiner did not have the opportunity to consider the teachings of Armitage when combined with the Barone reference to indicate that the Examiner did not sufficiently evaluate or appreciate the relevance of Armitage's teachings particularly when combined with the Barone reference and its teachings of filtering of accelerations. As we explained above, Petitioner has shown a reasonable likelihood of prevailing in showing claims 1, 22, 24, 25, 27–30, 36, and 37 are unpatentable. This combination, supported by the new Barone reference and the testimony of Mr. Ricca, demonstrates that Petitioner has shown that the Examiner erred in considering the teachings of Armitage. *See* Reply 5. Thus, we decline to exercise our discretion to deny institution of the claims challenged in ground 1 based on the combination of Armitage and Barone.

As for the remaining grounds, including those based on LeFebvre, because we find that the Examiner erred in the consideration of Armitage by failing to consider the combination of Armitage and Barone and institute on that ground alone, we need not consider whether the Examiner also erred in the consideration of LeFebvre. *Cf. SAS Inst.*, 138 S. Ct. at 1356 (“Section 314(a) does not require the Director to evaluate every claim individually. Instead, it simply requires him to decide whether the petitioner is likely to succeed on ‘at least 1’ claim. Once that single claim threshold is satisfied, it doesn’t matter whether the petitioner is likely to prevail on any additional claims; the Director need not even consider any other claim before instituting review.”). We note, however, that the Examiner did not consider LeFebvre combined with Barone, or any other art that disclosed the filtering limitation.

V. CONCLUSION

After considering the arguments presented in the Petition, the Preliminary Response, and the evidence of record, we determine that Petitioner has demonstrated at least a reasonable likelihood of success in proving that at least one claim of the ’915 patent is unpatentable. We also decline to exercise our discretion to deny the Petition under 35 U.S.C. § 325(d). Thus, we institute an *inter partes* review of all challenged claims (i.e., claims 1, 21–30, 36, and 37) on all grounds set forth in the Petition. Our determinations at this stage of the proceeding are based on the evidentiary record currently before us. This decision to institute trial is not a final decision as to patentability of any claim for which we have instituted an *inter partes* review. *See TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1068

(Fed. Cir. 2016) (noting that “there is a significant difference between a petitioner’s burden to establish a ‘reasonable likelihood of success’ at institution, and actually proving invalidity by a preponderance of the evidence at trial”). We will base any final decision on the full record developed during trial.

VI. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review is instituted for claims 1, 21–30, 36, and 37 of the ’915 patent on the unpatentability grounds asserted in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial, which commences on the entry date of this decision.

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