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Paper 27
Date: May 4, 2021

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DATASPEED INC.,
Petitioner,

v.

SUCXESS, LLC,
Patent Owner.

IPR2020-00116
Patent 9,871,671 B2

Before TREVOR M. JEFFERSON, MINN CHUNG, and NATHAN A. ENGELS, *Administrative Patent Judges*.

JEFFERSON, *Administrative Patent Judge.*

DECISION
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

In this *inter partes* review, Dataspeed Inc. ("Petitioner") challenges claims 1–19 ("the challenged claims") of U.S. Patent No. 9,871,671 B2 (Ex. 1001, "the '671 patent") owned by Sucxess, LLC ("Patent Owner"). Paper 1 ("Pet.").

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision, issued pursuant to 35 U.S.C. § 318(a), addresses issues and arguments raised during the trial in this *inter partes* review. For the reasons discussed herein, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–19 are unpatentable.

A. Procedural History

Petitioner filed a Petition challenging claims 1–19 of the '671 patent (Pet. 3, 18–65) and Patent Owner filed a Preliminary Response (Paper 11). We instituted trial on all grounds of unpatentability. Paper 12 ("Dec."), 27–28.

Patent Owner filed a Response (Paper 17, "PO Resp."), Petitioner filed a Reply (Paper 20, "Reply"), and Patent Owner filed a Sur-reply (Paper 21, "Sur-reply").

Petitioner submits the Declaration of Robert Leale (Ex. 1003) in support of the Petition and Reply. Patent Owner supports its Response and Sur-reply with the Declaration of Dr. Mahdi Shahbakhti (Ex. 2028). Petitioner also submits the Deposition Transcript of Mahdi Shahbakhti, Ph.D. (Ex. 1020) and Patent Owner submits the Deposition Transcript of Robert Leale (Ex. 2024).

A combined oral hearing for this *inter partes* review and related cases, IPR2020-00147 and IPR2020-00268 was held on February 11, 2021, a transcript of which appears in the record in each case. Paper 26 ("Tr.").

B. Instituted Grounds

We instituted *inter partes* review of the challenged claims on following grounds asserted by Petitioner under 35 U.S.C. § 103[1] (Dec. 7, 27–28):

Challenged Claims	35 U.S.C. §	References
1–15, 19	§ 103	Munoz[2] or Munoz, Negley[3], SAE[4], Bosch[5]
16–18	§ 103	Munoz or Munoz, Negley, SAE, Bosch, Lobaza[6]
1–15, 19	§ 103	Dietz[7], Negley, SAE, Bosch
16–18	§ 103	Dietz, Negley, SAE, Bosch, Lobaza

[1] The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) ("AIA"), amended 35 U.S.C. § 103. Because the '671 patent has an effective filing date prior to the effective date of the applicable AIA amendments, we refer to the pre-AIA versions of § 103.
[2] Munoz (US 7,737,831 B2; filed Feb. 6, 2007; issued June 15, 2010). Ex. 1004.
[3] Bruce Negley, *Getting Control Through CAN*, The Journal of Applied Sensing Technology, Oct. 2000, vol. 17, no. 10, pages 16–33. Ex. 1006.
[4] Craig Szydlowski, *A Gateway for CAN Specification 2.0 Non-Passive Devices*, SAE Technical Paper Series, 930005, Society of Automotive Engineers, Inc. 1993, pages 29–37. Ex. 1009.
[5] Robert Bosch, CAN Specification Version 2.0, Bosch, Sept. 1991. Ex. 1010.
[6] Lobaza et al. (US 6,812,832 B2; filed Nov. 26, 2002; issued Nov. 2, 2004). Ex. 1014.
[7] Audiotechnik Dietz, Installation/connection manual for multimedia interface 1280, March 16, 2005, http:/www.dietz.biz. Ex. 1005.

C. Real Party-in-Interest

Petitioner states that it, Dataspeed Inc., is the sole real party-in-interest. Pet. 2.

D. Related Proceedings

Patent Owner states that two patents in the same family as the '671 patent, namely, US 10,027,505 and US 10,454,707 are the subject of five district court cases involving Patent Owner and various third parties, namely, *Sucxess LLC v. AutoX Technologies, Inc.*, Case No. 1:19-cv-02121 (D. Del.); *Sucxess LLC v. Phantom Auto, Inc.*, Case No. 1:19-cv-02122 (D. Del.); *Sucxess LLC v. Pony.ai, Inc.*, Case No. 1:19-cv-02123 (D. Del.); *Sucxess LLC v. SF Motors, Inc.*, Case No. 1:19-cv-02124 (D. Del.); and *Sucxess LLC v. WeRide Corp.*, Case No. 1:19-cv-02130 (D. Del.). Paper 8, 1. Patent Owner also states that Petitioner filed a Petition for review of US 10,027,505 in IPR2020-00147. Paper 10, 1.

E. The '671 Patent (Ex. 1001)

Titled "Method, Apparatus and System for Retrofitting a Vehicle" (Ex. 1001, [54]), the '671 patent states that a vehicle could be retrofitted to add, for example, an emergency call apparatus. Ex. 1001, 2:48–49. The retrofit apparatus is used to transmit a message on the vehicle data bus. *Id*. at 2:54–57. The '671 patent states that a retrofit apparatus may be added to the vehicle with two data buses, with the first bus used to communicate with the original vehicle equipment and the second bus used to communicate with the rest of the vehicle. *Id*. at 3:33–37. With respect to this communication, the '671 patent states that the retrofit apparatus can be configured to mimic command messages to enable the original vehicle equipment to perform specified functions not originally enabled. *Id*. at 9:52–10:7.

In one embodiment of the '671 patent, the retrofit apparatus is an emergency call apparatus 214 that sends a message to a first apparatus, i.e., telecommunication apparatus 200 as seen in Figure 4, reproduced below.

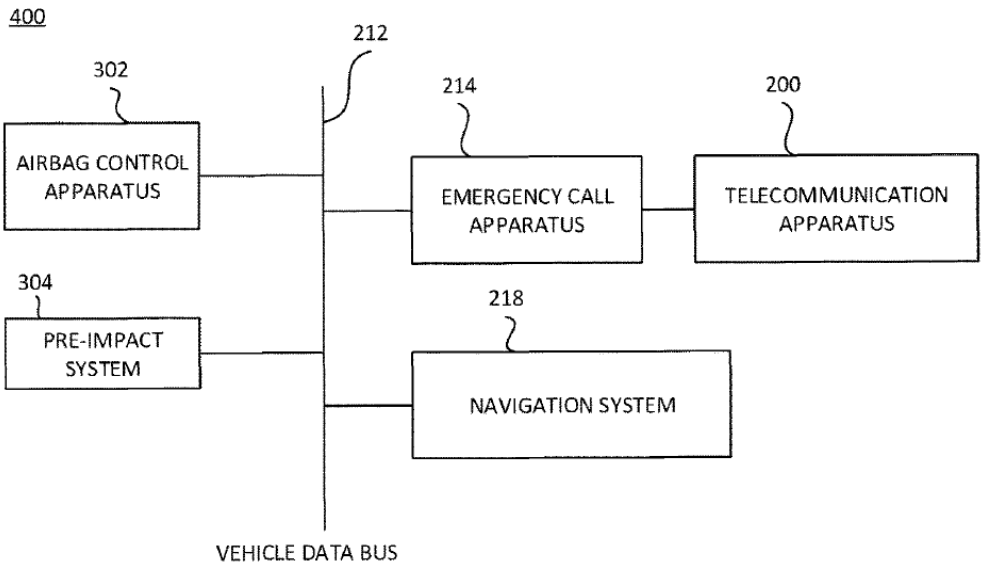


FIG. 4

Figure 4 illustrates vehicle communication system 400 having telecommunication apparatus 200 in communication with vehicle data bus 212 using an indirect connection through emergency call apparatus 214. Ex. 1001, 7:59–63. Emergency call apparatus 214 mimics the dial command message by using "the same message identifier segment that has been assigned to navigation system 218 when transmitting its telephone dial command message." *Id*. at 9:63–65. "By sharing the same message identifier segment a telephone dial command message originating from emergency call apparatus 214 and a telephone dial command message originating from navigation system 218 become indistinguishable for the telecommunication apparatus 200." *Id*. at 9:66–10:3. "Telecommunication apparatus 200 hence responds properly to a telephone dial command

message originating from emergency call apparatus 214 even though it may not have been designed for this purpose." *Id*. at 10:3–7.

Messages to telecommunication apparatus 200 are communicated through first and second data buses, as depicted in Figure 7, reproduced below.

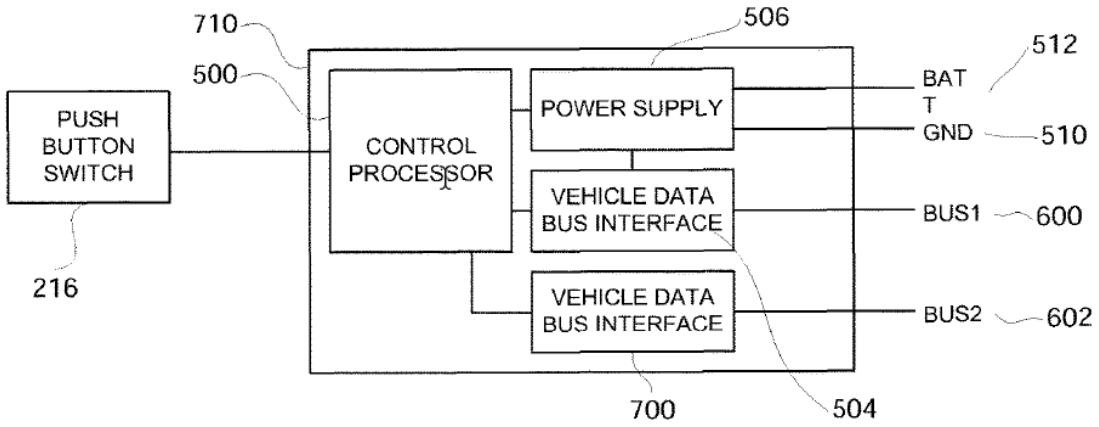


FIG. 7

Figure 7 is a block diagram that depicts emergency call apparatus 710. Ex. 1001, 8:60–61. In Figure 7, control processor 500 communicates with telecommunication apparatus 200 through vehicle data bus interface 504 and electric terminal 600. *Id*. at 8:61–64. Control processor 500 also communicates with other electronic modules connected to vehicle data bus 212 through second vehicle data bus interface 700 and electric terminal 602. *Id*. at 8:64–66. "Control processor 500 retransmits any messages it receives from vehicle data bus interface 504 through vehicle data bus interface 700 and any messages it receives from vehicle data bus interface 700 through vehicle data bus interface 504, thereby functionally connecting telecommunication apparatus 200 with vehicle data bus 212." *Id*. at 9:7–13.

F. Challenged Claims

Petitioner challenges claims 1–19 of the '671 patent. Claims 1, 6, and 10 are independent claims, and claim 1 is reproduced below with added identification of claim limitations in brackets.

1. [1.p] A method comprising:

[1.1] providing a vehicle having a factory-installed first apparatus including a processor, programmed to communicate with a factory-installed second apparatus through a vehicle data bus with a first message having an identifier;

[1.2] electrically disconnecting the vehicle data bus between the factory-installed first apparatus and the factory-installed second apparatus;

[1.3] adding a second bus to the vehicle;

[1.4] electrically connecting a retrofit apparatus to the vehicle data bus and to the second data bus;

[1.5] electrically connecting the factory-installed first apparatus to the second data bus; and

[1.6] transmitting a second message from the retrofit apparatus to the factory-installed first apparatus through the second bus, the second message being indistinguishable from the first message.

Ex. 1001, 11:18–35.

II. ANALYSIS

A. Level of Ordinary Skill in the Art

Our Decision instituting *inter partes* review included a preliminary determination that a person of ordinary skill in the art ("POSITA") would have had a bachelor's degree in engineering with relevant coursework or post-secondary education (Bachelor's or associate degree) and four years of

work experience in the design, operation, and functioning of CAN systems or systems using similar communications protocols. Dec. 8–9; *see* Pet. 12 (citing Ex. 1003 ¶ 51). After institution, Petitioner did not contest the level of ordinary skill, and Patent Owner "embraced the Board's guidance" (PO Resp. 11–12). Accordingly, we apply the same level articulated in the Decision.

B. Claim Construction

Because the Petition was filed after November 13, 2018, we construe claims of the challenged patent using the same claim construction standard used to construe claims in a civil action under 35 U.S.C. § 282(b), including construing the claims in accordance with the ordinary and customary meaning as understood by one of ordinary skill in the art reading the claims in light of the intrinsic evidence. 37 C.F.R. § 42.100(b) (2019); *see Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005).

The parties propose constructions for the terms "data bus," "adding a second data bus," "responds," and "receives." Pet. 7–12; PO Resp. 6–10. We address the claim construction issues below.

1. "Data bus"

Independent claim 1 recites "a processor, programmed to communicate with a factory-installed second apparatus through a vehicle *data bus*," "electrically disconnecting the vehicle *data bus*," and "electrically connecting a retrofit apparatus to the vehicle *data bus*" (emphases added). Independent claims 6 and 10 recite substantially similar limitations.

According to Petitioner, "a POSITA would understand a 'data bus' to refer to 'a contiguous network providing a communication channel for two or more modules,'" when construed in light of the Specification. Pet. 7

(citing Ex. 1003 ¶ 59). Patent Owner contends Petitioner's definition is not helpful and that defining "data bus" to be a "contiguous network" is confusing. PO Resp. 6. Patent Owner further states that "'bus' should be construed as defined in the applicable ISO-Standard 11898 as a 'topology of a communication network, where all nodes are reached by passive links which allow transmission in both directions.'" PO Resp. 6–7 (citing Ex. 2002, 2; Ex. 2028 ¶¶ 21–22).

We determine it is unnecessary to interpret "data bus," and we apply the term's plain and ordinary meaning. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (explaining the need to construe only terms that are in controversy and only to the extent necessary to resolve the controversy) (citations omitted).

2. "Adding a Second Data Bus"

Claim 1 also includes the limitation "adding a second bus to the vehicle." Petitioner asserts that this limitation should be construed as "adding a second communication channel," because the Specification does not require physical wiring for the second bus, only providing a communication channel. Pet. 11 (citing Ex. 1003 ¶¶ 59, 98–105). Petitioner states that "a POSITA would understand FIG. 4 and FIG. 7 [of the '671 Patent] as disclosing a vehicle data bus 212, and a separate, or second, data bus connecting the emergency call apparatus 214 and telecommunication apparatus 200." Pet. 10.

Patent Owner contends that "[a]dding a second bus" should be understood as "adding a second communication network which is electrically isolated from an existing first communication network." PO Resp. 9 (citing Ex. 2028 ¶¶ 23–25). Patent Owner acknowledges that "[a]

second data bus does add a communication channel, but not every added communication channel is necessarily a second data bus," which makes Petitioner's construction overly broad. PO Resp. 7, Ex. 2028 ¶ 23. Patent Owner asserts that Figure 4 of the '671 patent refers to Figure 6 which shows the internal wiring of the retrofit apparatus with a switch that isolates the BUS1 and BUS2 shown in Figure 6. PO Resp. 8–9; Ex. 1001, 7:63–64.

We are not persuaded by Patent Owner's argument and evidence. The '671 patent describes the retrofit apparatus of Figure 4 as being further explained by both Figures 6 and 7, which are alternative embodiments of the retrofit apparatus. *See* Ex. 1001, 7:63–64, 8:25–27; 8:60–61. Patent Owner has not shown that the term "adding a second bus to the vehicle" is limited to the embodiment shown in Figure 6, nor has Patent Owner shown that an ordinarily skilled artisan would know that adding an electrically isolated communication channel was required by the claims. PO Resp. 8–11.

We agree with Petitioner that in the '671 patent "adding second data bus provides a communication channel between the 1st factory-installed apparatus (200) and the retrofit apparatus (214)." Pet. 11 (citing Ex. 1003 ¶¶ 98–105); Ex. 1001, 2:48–53, 6:65–7:24 (discussing adding an electrical connection and rewiring to connect retrofit apparatus between two existing apparatuses). Based on the record and consistent with the embodiment disclosed in Figures 4 and 6 of the '671 patent, we agree with Petitioner that "adding second data bus" should be construed as "adding a second communication channel."

3. "Responds"

Dependent claim 12 recites "the factory-installed first apparatus *responds* to the second message originating from the retrofit apparatus as if

it were the first message which the first processor is programmed to receive from the factory-installed second apparatus" (emphasis added). Petitioner proposes that "[t]he word 'responds' should be interpreted to mean 'act on,' which is consistent with the understanding of a POSITA in the field of CAN systems." Pet. 11 (citing Ex. 1003 ¶ 63; Ex. 1006, 6–7, 13, Fig. 8). Patent Owner does not disagree with Petitioner and asserts that no clarification from the Board is necessary. PO Resp. 9.

We do not expressly interpret "responds," and apply the plain and ordinary meaning.

4. "Receives"

Although Petitioner does not directly advance an interpretation of "receives," Patent Owner contends Petitioner construes the term too broadly by advancing the position that a message is received when it arrives in a processor's "Receive Assembly Registers" block. PO Resp. 9–10. According to Patent Owner, Petitioner's implied interpretation would mean that all nodes on a network receive all messages, such that "receiving a message" would be meaningless to differentiate nodes. PO Resp. 7, 10. Patent Owner asserts that consistent with Negley's description of message receipt, "receive" in the context of the claims should be construed as "accept" because it "indicates, in the case of [a CAN bus], an acceptance of a message in a device's receive register." PO Resp. 10–11 (citing Ex. 2024, 25:23–26:5 (Deposition of Mr. Leale)); Ex. 2028 ¶ 27. Patent Owner further argues that this construction is consistent with Negley's discussion of node buffers and filters that determine which messages to receive (Ex. 1006, 15) and Munoz that recites in its claims a device configured to receive input

signals (Ex. 1004, 8:22–23, 9:59–60). PO Resp. 10–11. Petitioner does not respond directly to Patent Owner's contention. *See* Reply.

We are not persuaded by Patent Owner's argument with respect to "receive." Patent Owner's declarant cites Negley's Figure 8, which depicts the CAN bus acting on bus messages. Ex. 2028 ¶ 27. Figure 8 in Negley expressly states that "[e]very active node reads every message transmitted on the [CAN] bus" and "[w]hen a node receives a message and determined that there are no errors . . . the identifier . . . is checked to determine if the message should be acted on." Ex. 1006, 11 (Fig. 8). Thus, Negley describes "receive" as part of a process for CAN controllers to "us[e] masks, filters, and interrupts to minimize message processing requirements." Ex. 1006, 12 (describing Figure 8). Patent Owner has not provided sufficient argument and evidence that a person of ordinary skill in the art would understand "receive" as recited in the claims in view of the intrinsic evidence to mean acceptance of a message in a device's receive register. PO Resp. 10–11. The intrinsic evidence does not limit "receive" as recited in the claims to the specific "receive register" that Patent Owner's declarant testifies allows the microcontroller to act on the received message. Ex. 2028 ¶ 27.

Patent Owner's argument construes "accept" to indicate that the microcontroller acts upon a message after certain masks or filters have passed the message. Ex. 2028 ¶ 27; PO Resp. 10–11 (citing Ex. 1006, 11 (Fig. 8)). However, Figure 8 of Negley also states that "every active node reads every message" and describes the processing as a node "receiv[ing] a message." Ex. 1006, 12 (Fig. 8). Thus, we are not persuaded that the '671 patent's discussion of "configured to receive" or "programmed to receive" (Ex. 1001, 2:25, 9:40, 9:53, 9:56, 11:47, 12:12, 12:25 12:30) indicates that

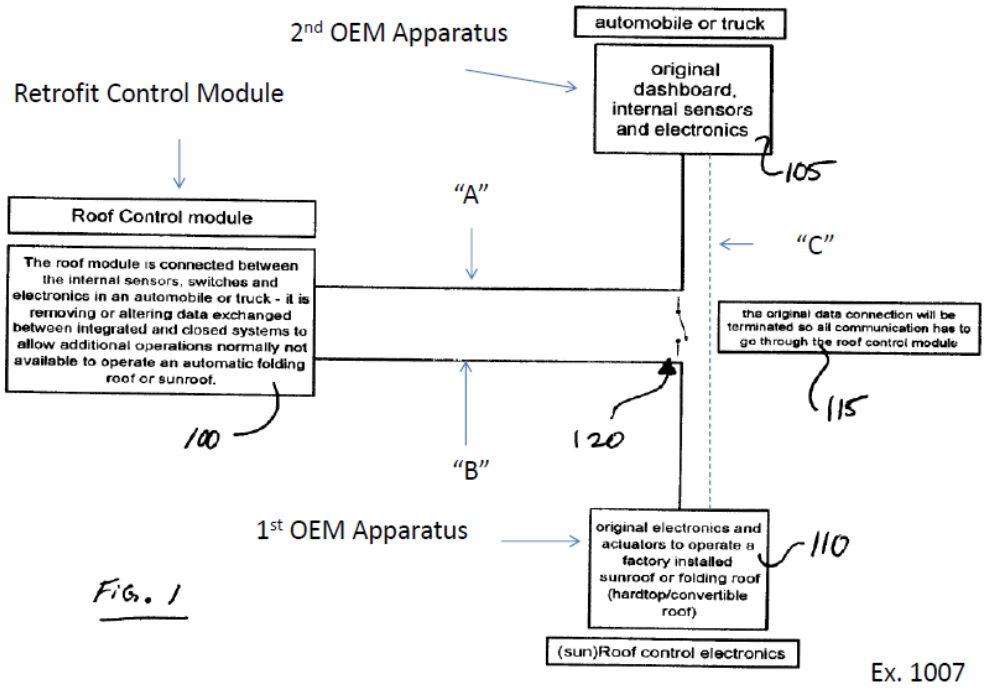
the claim term "receive" requires microcontroller action to deem a CAN bus message received. Ex. 2028 ¶ 27.

We do not expressly interpret "receives," and apply the plain and ordinary meaning.

C. Asserted References

1. Munoz (Ex. 1004)

Munoz discloses "control devices that interface with automobile computers in order to control multiple automobile systems." Ex. 1004, 1:9–10. Specifically, Munoz discloses "an after-market automobile device that is seamlessly integrable to factory automobile networks such as CAN-bus and [its] ECU systems and allows multiple convenience and performance enhancements to be controlled through factory controls and displayed on factory displays." Ex. 1004, 3:7–12. Munoz's Figure 1 is provided below with annotations added by Petitioner.



Ex. 1007.

Munoz's Figure 1 is a flow chart that illustrates the operation of roof control module 100. Ex. 1004, 6:26–30. Figure 1 depicts that switch 120 connects vehicle factory dashboard electronics and controls 105 to Roof Control Electronics 110 via Roof Control Module 100, such that the factory data connection is routed through the Roof Control Module 100. Ex. 1004, 6:32–36. Munoz discloses that the device improves over other systems by operating using only the factory display such that messages to "operate and adjust the device's features and settings are displayed on the vehicle's factory display." *Id*. at 3:43–47. Munoz explains that by using the device, "the user may control multiple additional functions and operations, integrated by the device, without the need for additional displays." *Id*. at 3:47–49.

2. Negley (Ex. 1006)

Negley discloses that a Controller Area Network ("CAN") is a protocol that "creates a communications path that links all the nodes connected to the bus and enables them to talk to one another." Ex. 1006, 18. Negley discloses the CAN protocol uses a message-based data format to transfer information from one location to another. *Id*. at 20. Among other things, Negley describes that all messages have an identifier field and that the node uses the identifier to determine whether to accept and act upon an incoming message. *Id*. at 21.

3. SAE (Ex. 1009)

SAE discloses that the CAN protocol "offers a comprehensive solution to managing communication between multiple CPUs," using message identifiers. Ex. 1009, 29.

4. Bosch (Ex. 1010)

Bosch discloses that CAN is a serial communications protocol that supports distributed real-time control with a high level of security. Ex. 1010, 4. Bosch explains that information on a bus is sent in fixed format messages and that the content of a message uses an identifier, so that all nodes in a network are able to decide whether the data is to be acted upon by them. Ex. 1010, 6.

D. Obviousness over Munoz, Negley, SAE, and Bosch

Petitioner contends that Munoz alone or in combination with Negley, SAE, and Bosch teaches the limitations of claims 1–15 and 19. Pet. 18–41. Petitioner provides a limitation-by-limitation comparison of each of claims 1–15 and 19 to Munoz and states to the extent that certain limitation are "not clearly disclosed by Munoz when viewed in light of the knowledge possessed by a POSITA, it would have been obvious to complement Munoz's teachings with the standard CAN bus teachings of Negley, SAE, and Bosch." Pet. 20–21. Petitioner also cites to the Declaration of Robert Leale (Ex. 1003) to support their obviousness grounds. Pet. 18–41. We address the parties' contentions regarding claim 1 below.

1. Motivation to Combine & Background References

Petitioner provides sufficient support for the motivation to combine the teachings of Munoz, Negley, SAE, and Bosch. Pet. 21–22. Petitioner argues that a POSITA would have understood that the ECU and CAN bus features of Munoz are supported by the CAN protocol teachings of Negley, Bosch, and SAE. Pet. 19–20; Ex. 1003 ¶¶ 133–145; Ex. 1006, 7 (discussing sensor nodes on CAN including a microcontroller); Ex. 1009, 3 (discussing

CAN protocol); Ex. 1010, 6–16, 38–51, 58 (discussing messaging over CAN).

In addition to combining the Munoz, Negley, SAE, and Bosch references Petitioner also provides sufficient testimony and argument to rely on the Negley, SAE, and Bosch references to support the knowledge that skilled artisans would have brought to bear on the prior art functions of CAN systems (Pet. 15–17, 19–22). *See Randall Mfg. v. Rea*, 733 F.3d 1355, 1362 (Fed. Cir. 2013); *see also Ariosa Diagnostics v. Verinata Health, Inc*., 805 F.3d 1359, 1365–66 (Fed. Cir. 2015).

Patent Owner argues that "[a] POSITA, having studied Munoz and being familiar with the operation of a CAN bus as disclosed in Bosch, Negley and SAE, would not have been enabled to implement Munoz's 'open roof while driving' feature." PO Resp. 21 (citing Ex. 2028 ¶ 36). Patent Owner relies heavily on additional information showing the purported implementation of Munoz's invention in vehicles as shown in YouTube videos. PO Resp. 21–31; Ex. 2028 ¶¶ 36–44; Ex. 2030. We do not agree with Patent Owner that Munoz's teachings are compromised by Patent Owner's evidence regarding a single implementation method described in Ex. 2030 and Ex. 2028 ¶¶ 36–44. Accordingly, Petitioner provides sufficient argument and evidence to support the combination of Munoz, Negley, SAE, and Bosch.

E. Petitioner's Expert Alleged Bias

Patent Owner asserts that we should discount Mr. Leale's declaration because, according to Patent Owner, Mr. Leale he has an interest in the outcome of the litigation because he may have practiced the claims of the '671 patent. PO Resp. 3–4, 14–18. We find this argument unavailing.

During his deposition, Patent Owner's counsel asked Mr. Leale whether he had installed retrofit devices and spoofed CAN messages. Ex. 2024, 107:6–20, 111:23–112:22. Patent Owner contends Mr. Leale's testimony suggests that "Mr. Leale is a likely infringer" (PO Resp. 15) and that "Mr. Leale's testimony . . . makes clear that he stands to personally benefit if the '671 patent is found invalid" (PO Resp. 18). Mr. Leale provided his declaration testimony before he was put in "fear that he would be sued by Patent Owner" (Prelim. Resp. 14), and Mr. Leale's deposition responses do not establish that the declaration testimony should be discounted in this case. Furthermore, Patent Owner's deposition objections (PO Resp. 15–17; Ex. 2024, 109:8–111:8) do not support discounting Mr. Leale's testimony. We also note that Patent Owner's evidence does not establish that Mr. Leale was aware of the alleged infringement when he provided his sworn declaration. *See* PO Resp. 15–17. We are not persuaded by Patent Owner's argument that Mr. Leale is personally biased, and we give Mr. Leale's testimony due weight.

F. Munoz Fails to Teach

Patent Owner argues that Munoz alone or in combination fails to teach the limitations of the claims in general because Munoz contains numerous differences from the '671 patent. PO Resp. 32–38 (arguing that Munoz's disclosure implements a different scheme). Specifically, Patent Owner bases its arguments on implementation of the Munoz-based retrofit product in the Volkswagen Eos automobile. *See* Ex. 2030; Ex. 2028 ¶¶ 51–55.

Patent Owner argues that the implementation shown in Ex. 2028 ¶¶ 51–55 demonstrates that Mr. Leale's testimony is wrong regarding the

teachings of Munoz. PO Resp. 38–40; *see* Ex. 2028 ¶ 60 ("[I]t is my opinion that Munoz's invention had been demonstrated in a VW Eos. My further analysis is therefore based on that vehicle.").

We disagree with Patent Owner that an implementation of the Munoz retrofit device in a specific vehicle demonstrates the differences between the teachings of Munoz and the '671 patent. *See* PO Resp. 32. Patent Owner's evidence does not tie the implementation shown in Ex. 2030 to the disclosure in the Munoz patent reference, and the reference is not limited to the specific implementation Patent Owner cites. Patent Owner's reliance on the implementation in Ex. 2030 is misplaced, as it does not address sufficiently the teachings from the Munoz reference, or show that an ordinarily skilled artisan would have known that Munoz was limited to such an implementation or would have been viewed through the specific vehicle implementation shown in Exhibit 2030.

Based on the full record, we are not persuaded by Patent Owner's arguments based on the implementation of Exhibit 2030 that Munoz fails to disclose certain limitations of the '671 patent. PO Resp. 33–34; Ex. 2028 ¶ 51. Indeed, Patent Owner's arguments are based solely on the specific implementation of Munoz, such as assuming that Munoz's implementation shows a pass through of messages and that the original data connection is maintained creating a single common bus. PO Resp. 36–38; Ex. 2028 ¶¶ 40, 54, 56, 81–95, 103–105; Reply 5–6. Munoz's demonstration of a specific vehicle implementation does not persuasively address the teachings of Munoz patent reference in Exhibit 1004. We address Patent Owners specific arguments based on the implementation of Munoz below.

1. Claim 1

a. [1.p] *A method comprising* [1.1] *providing a vehicle having a factory-installed first apparatus including a processor, programmed to communicate with a factory-installed second apparatus through a vehicle data bus with a first message having an identifier*

Petitioner contends Munoz discloses a "method of adding a retrofit device to a vehicle." Pet. 18 (citing Ex. 1004, 1:41–57). Petitioner contends Munoz teaches limitation 1.1 with its disclosures relating to Munoz's vehicle with a factory-installed first apparatus 110 programmed to communicate with a factory-installed second apparatus 105 through vehicle data bus 115. Pet. 18 (citing Ex. 1004, Fig. 1). According to Petitioner, based on the teachings of "Negley, Bosch, and SAE, a POSITA would have known that CAN message protocols use message identifier bits and a bus message transmitted by the [second] factory-installed apparatus 105 to the [first] factory-installed apparatus 110 would have constituted a 'first message having an identifier' of claim 1." Pet. 20 (citing Ex. 1003 ¶¶ 133–145); *see* Ex. 1006, 7 (discussing sensor nodes on CAN including a microcontroller); Ex. 1009, 3 (discussing CAN protocol); Ex. 1010, 6–16, 38–51, 58 (discussing messaging over CAN).

Patent Owner asserts that

> Munoz does not disclose any communication between the original dashboard 105 and the roof control electronics 110. Munoz describes Fig. 1 as "105 illustrates the vehicle factory dashboard electronics and controls that are used to control Roof Control Electronics 110." Ex. 1004, 6:28–30. That the original vehicle dashboard electronics 105 is used to control the original roof electronics 110 as part of Munoz's invention after the retrofit does not indicate that the two communicated with one another before the retrofit. *See* Ex. 2028, ¶65.

PO Resp. 41. Thus, Patent Owner's argument asserts that controls for the Roof Control Electronics of Munoz are directly connected to the roof control electronics and not to CAN bus. PO Resp. 35, 40–42. In other words, Patent Owner argues that the implementation shown in Ex. 2030 and other 2007 model year vehicles show that factory cabriolet tops were hardwired to the equivalent of Munoz's original roof electronics as they are in the Volkswagen implementation. PO Resp. 42–44

Patent Owner's argument ignores the express disclosure in Munoz that the controls for the Roof Control Electronics 110 are in the dashboard 105, not directly connected to Roof Control Electronics 110. Ex. 1004, 6:26–30. Patent Owner's arguments and Dr. Shahbakhti's testimony (Ex. 2028 ¶ 65) are based on the single implementation shown in Ex. 2030 (Ex. 1020, 39:1–40:22) without addressing Munoz's express teachings regarding the location of the original controls and their continued use after the retrofit. Reply 19 (citing Ex. 1004, 1:55–60; 3:10–12; 3:18–21; 3:34–36; 3:43–45; 3:49–50; 4:25–26; 4:56–59; 5:21–26).

Patent Owner's arguments are also based on the assertion that Munoz uses hardwired or direct controls between the dashboard and the controls for the Roof Control Electronics 110 before the Munoz retrofit is installed between these devices. PO Resp. 41–42. Because of this direct control, Patent Owner concludes that there is no communication between the original dashboard 105 and the roof control electronics 110 and therefore no "first message." *Id.* at 38, 41 (citing Ex. 2028 ¶ 55). *See* Reply 19–20. We disagree with Patent Owner. We credit Petitioner's argument and evidence that a "first message" from the dashboard 105 is sent to control the Roof Control Electronics 110 to open or close the roof, and this same "first

message" is sent to the Roof Control Module 100 via bus "A" after Munoz's retrofit is installed. Pet. 24–26.

We are not persuaded by Patent Owner's arguments that implementation in particular vehicles (Ex. 2030) with a direct wired connection between the dashboard and roof controls demonstrates that Munoz's first message and second messages are not implemented. PO Resp. 36–40, 42–44. Patent Owner has not persuasively shown that the wiring of the "open/close roof button" in Exhibit 2030 or other vehicles demonstrates that Munoz does not teach a first message. PO Resp. 42–44. Petitioner has shown persuasively that

> a POSITA would have understood that when the aftermarket functionality is disabled, a first CAN message sent from the original dashboard 105 intended for the original electronics to operate the factory-installed roof 110 would have been received by the retrofit roof control module 100 via bus "A", and the retrofit roof control module 100 would have transmitted a second CAN message via bus "B", indistinguishable from the first CAN message, to the factory-installed roof 110 with the proper information in the identifier field, and the identical command from the original dashboard 105. Pet., 24–26; Ex. 1003, ¶¶143–45, 160–61.

Reply 20–21; *see* Pet. 24–26.

Based on the full record, we determine that Petitioner provides sufficient evidence that Munoz in view of knowledge of Negley, SAE, and Bosch teach limitation 1.1.

b. [1.2] *electrically disconnecting the vehicle data bus between the factory-installed first apparatus and the factory-installed second apparatus*

Petitioner contends that the annotated Figure 1 of Munoz, reproduced above, discloses this limitation because Munoz's "[s]witch 120, when open,

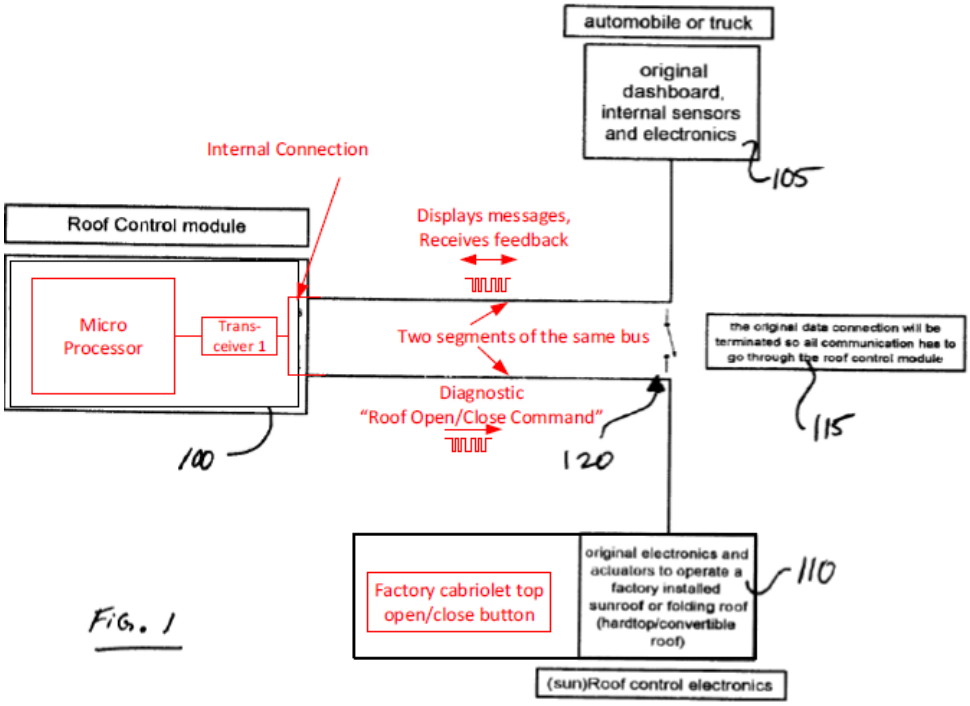
terminates the connection between the 1st factory-installed apparatus 110 and the [second] factory-installed apparatus 105." Pet. 23 (citing Ex. 1003 ¶¶ 139–145, 154; Ex. 1004, 6:32–36; Fig. 1). We agree with Petitioner that Munoz's Figures 1 and 2 illustrate terminating the original data connection so that all communications go through the roof module. Reply 12–14; Ex. 1006, Fig. 1, (item 115). Patent Owner does not contest Petitioner's showing, and we determine that Petitioner provides sufficient evidence that Munoz teaches this limitation.

c. [1.3] *adding a second data bus to the vehicle*

Petitioner contends that Munoz adds second data bus "B" to the vehicle as show in annotated Ex. 1007. Pet. 24 (citing Ex. 1004, 6:32–36; Ex. 1003 ¶¶ 139, 142, 155; Ex. 1007).[8]

Patent Owner disagrees with Petitioner's characterization of Munoz's Figure 1 and offers an alternative interpretation, reproduced below. PO Resp. 45–47; Ex. 2028 ¶¶ 81–83.

[8] Ex. 1007 is Petitioner's annotated Figure 1 of Munoz, reproduced above.



PO Resp. 46. Patent Owner annotates Figure 1 of Munoz to argue that the routing referred to in Munoz does not separate Munoz's bus into two separate buses or use the roof control module of Figure 1 as a gateway. PO Resp. 47–48 (Ex. 2028 ¶¶ 85–86). Patent Owner argues that instead Munoz meant that a particular path for the bus wire (an internal connection) has to be installed and that a path through the retrofit apparatus 100 allows communication to go through the apparatus. PO Res. 47 (citing Ex. 1004, 6:35); *see* Ex. 2028 ¶¶ 85–86. Thus, Patent Owner asserts that Munoz teaches "[t]wo segments of the same bus" and not separate buses. *Id.* at 46–47. We disagree with Patent Owner.

Munoz teaches that a second communication path from the Roof Control Module 100 to the factory installed apparatus terminates the prior connection so all communication goes through the roof control module. Pet. 23–24, 39–40; Reply 9–10; Ex. 1004, 3:50–4:23, Fig. 1 (100, 115); Ex. 1003

¶ 154. In addition, because Munoz teaches altering or removing data to allow new features not normally available, the Munoz device teaches a second communication channel or data bus. *See* Ex. 1004, 3:50–4:23, Fig. 1 (100); Ex. 1003 ¶¶ 198–199; *see* Reply 5–6. We do not agree with Patent Owner that Munoz teaches a pass through connection.

Munoz expressly teaches that because the "original data connection will be terminated so all communication has to go through the roof control module," (Ex. 1004, Fig. 1 (115)) as a part of adding the Roof Control module 100. Furthermore, Munoz introduces switch 120 in Figure 1 that separates the original data connection between dashboard 105 and Roof Control Electronics 110 of Figure 1 (Ex. 1004, 6:32–36), and Figure 2, which shows the retrofit device 200 connected to two CAN buses via two interfaces. *See* Pet. 22–23; Ex. 1003 ¶¶ 143, 154. Contrary to Patent Owner's contention (PO Sur-reply 11–12), we do not find that Petitioner's reference to Figure 2 raises a new theory. *See* Pet. 22 n.10.

Patent Owner's arguments that Munoz fails to show that its retrofit device acts as a gateway or spoofs regular messages are also not persuasive. PO Resp. 48–50. Munoz expressly states that there are two CAN buses. Ex. 1003, 6:26–40, Figs.1 and 2. Accordingly, the retrofit device in Munoz sits between a first CAN bus and second CAN bus as shown in Figure 2. *Id.* Patent Owner's argument that Munoz's device is not performing as a gateway or retransmitting over separate buses is not availing given Munoz's device location and Munoz's teaching that the device can remove or alter data "to allow additional operations normally not available to operate an automatic folding roof or sunroof." *Id.*; Ex. 1004, Fig 1 (100).

We also disagree with Patent Owner's argument that the device transitions shown in Figures 3–7 of Munoz indicate that the device does nothing when the module is off and cannot actively act as a pass through. PO Resp. 50. We agree with Petitioner that the device transitions indicates the initial start of the device and do not refute the subsequent functions described in Munoz. Reply 24; Ex. 1004, 6:43–44.

Patent Owner's assertion that if Munoz's device were a gateway it would not read on Munoz's claims is also not persuasive as Munoz's teachings are not limited to the claims. PO Resp. 50. However, Munoz's claims provide further evidence that Munoz's retrofit "device" is configured to transmit and receive signals related to roof operations, including to "supply open and close commands" based upon received signals and to "override factory cabriolet top controls." Ex. 1004, 8:28–36. Indeed, Patent Owner admits that the CAN standard was specifically designed to allow nodes to be added to an existing network and that separating a vehicle into two buses would be necessary to support periodic messages. PO Resp. 49 (citing 1006, 8)). Thus, Patent Owner's arguments support that Munoz's performance as a gateway would meet its stated goal of providing operation "without compromising existing factory features." Ex. 1004, 5:21–26.

Based on the full record, Petitioner presents sufficient argument and evidence that Munoz teaches the limitation for adding the second bus as recited in claim 1. Pet. 23–24; Ex. 1004, 6:32–36; Ex. 1003 ¶¶ 139, 142, 155.

d. [1.4] *electrically connecting a retrofit apparatus to the vehicle data bus and to the second data bus*

Petitioner contends the annotated Figure 1 of Munoz, reproduced above, teaches this limitation because Munoz's "roof control module 100 is connected to both the vehicle data bus 'A' and to the second vehicle data bus 'B' and is disclosed as an aftermarket automobile device." Pet. 24 (citing Ex. 1003 ¶¶ 128–132, 137–139, 157; Ex. 1004, 3:7–12, 3:50–4:33; Fig. 1). Patent Owner asserts that because Munoz does not teach a second data bus, Munoz does not teach connecting a retrofit apparatus to the second data bus. PO Resp. 51.

On the full record, we find that Petitioner has provided sufficient evidence and argument regarding the electrical connection of the data bus in Munoz. Accordingly, we determine that Petitioner provides sufficient evidence that Munoz teaches limitation 1.4.

e. [1.5] *electrically connecting the factory-installed first apparatus to the second data bus*

Petitioner contends that Munoz shows this step in Figure 1, wherein factory-installed first apparatus 110 is electrically connected to second data bus "B." Pet. 24 (citing Ex. 1004, 6:32–36; Ex. 1003 ¶¶ 135–144, 159). Patent Owner asserts that because Munoz does not teach a second data bus, Munoz does not teach connecting a factory-installed first apparatus to the second data bus. PO Resp. 51.

We determine that Petitioner provides sufficient and persuasive evidence that Munoz teaches limitation 1.5.

f. [1.6] *transmitting a second message from the retrofit apparatus to the factory-installed first apparatus through the second data bus, the second message being indistinguishable from the first message*

Petitioner contends Munoz teaches or suggests transmitting an indistinguishable message as claimed in limitation 1.6 by disclosing that all communication passes through the roof control module 100, which a POSITA would have understood to include "the identical command from the original dashboard 105," because Munoz's aftermarket device "allows multiple functions to be performed without interfering with vehicle controls or requiring additional appurtenances." Pet. 25–26 (citing Ex. 1003 ¶¶ 143–145, 160–161; Ex. 1004, 3:50–4:33, 5:21–26, Fig. 1).

Patent Owner's arguments are based on the arguments presented above with respect to limitations 1.1 and 1.3, which assert that Munoz fails to disclose two separate data buses and fails to teach a first message from the original dashboard 105 to the factory installed roof 110. PO Resp. 52; Ex. 2028 ¶ 99. For the reasons discussed above, we are not persuaded that Munoz's description of how the device operates when it is off indicates that it does not perform the normal functions described when it is on. PO Resp. 52–53; Reply 24; Ex. 1004, 6:43–44. Indeed, Patent Owner acknowledges that Munoz teaches the open roof signal with an appropriate CAN bus identifier to which the roof control electronics recognize and respond. PO Resp. 53–54; Ex. 1004, 6:50–53. Although Patent Owner asserts that Munoz does not explain how it is possible to send the open roof message (PO Resp. 53–54), we credit Petitioner's argument and evidence that Munoz achieves additional functionality by suppressing and altering CAN bus messages to the Roof Control Electronics 110, which may otherwise prohibit roof operation. Reply 8–9; Pet. 39–40; Ex. 1004, 3:54–64.

Patent Owner's argument that Munoz supports the use of diagnostic messaging over spoofing a regular CAN message is not supported persuasively by the record. PO Resp. 54–55. We agree with Petitioner that block 100 of Figure 1 discloses that the retrofit Roof Control Module 100 can remove or alter data "to allow additional operations normally not available to operate an automatic folding roof or sunroof," which supports the implementation of a second message or command over the added data bus. Ex. 1004, Fig 1 (100); *see also id*., 3:13–18; 3:62–64; 4:15–27; 5:14–20; Reply 17.

Finally, Patent Owner's evidence based on the implementation of Munoz in a particular vehicle using diagnostic roof open commands (PO Resp. 53–56; Ex. 2028 ¶¶ 102–104) is not availing or persuasive. Munoz does not disclose adding new messages to the CAN bus to perform the retrofit's roof control module functions, but instead discloses altering or removing data. Ex. 1004, Fig. 1 (100). Indeed, Patent Owner acknowledges that Munoz teaches the open roof signal with appropriate CAN bus identifier to which the roof control electronics recognize and respond. PO Resp. 53–54. In addition, Patent Owner's arguments regarding the use of diagnostic commands is supported by its contention that the Munoz system is on a single common bus (PO Resp. 33), which we reject above in limitation 1.3. Patent Owner's reliance on the Munoz claims (PO Resp. 55; Ex. 1004, 8:24–34) is misplaced as the use of the term commands versus signals in the claims does not establish the use of diagnostic commands. Patent Owner has not shown persuasively that the Munoz claims limit the teachings of Munoz to diagnostic commands.

Based on the full record before us, Petitioner provides sufficient and persuasive evidence and argument that Munoz in combination with Negley, Bosch, and SAE teaches limitation 1.6. Pet. 24–26; Ex. 1003 ¶¶ 143–145, 160, 161.

g. *Conclusion: Claim 1*

Based on the record before us, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 1 would have been obvious over Munoz in combination with Negley, Bosch, and SAE.[9]

2. Dependent Claims 2–5

For claim 2, Petitioner contends that "a POSITA would understand that the second message from the retrofit control module 100 employs a message identifier identical to that originally used by the first message . . . so that the first factory-installed apparatus 110 (roof electronics) would recognize, accept, and act upon the second message." Pet. 26 (citing Ex. 1003 ¶ 163). Patent Owner argues that a diagnostic message identifier would be used instead of an identical first message header. PO Resp. 56; Ex. 2028 ¶¶ 106–107. For the reasons discussed above, we are not persuaded that Munoz teaches the use of diagnostic messages based on the implementation of Exhibit 2030.

[9] Although Petitioner raises arguments based that Munoz alone viewed through the lens of knowledge of a POSITA informed by Negley, SAE, and Bosch discloses all features of claim 1, our Decision addresses the combination of the references with respect to limitation 1.1. *See* Pet. 19–22, 26. Accordingly, our decision addresses the combination of references asserted throughout and does not reach the issue of whether Munoz alone renders claim 1 obvious.

We find on the full record that Petitioner has shown by a preponderance of the evidence that Munoz in combination with Negley, Bosch, and SAE teach the message identifier limitation of claim 2.

With respect to claim 3, Petitioner contends that Munoz discloses receiving the first message in the retrofit apparatus because Munoz discloses that "all communication [from 105 to 110] has to go through the [retrofit] roof control module [100]." Pet. 27 (citing Ex, 1004, Fig. 1 (115)). Patent Owner argues that Munoz does not disclose the first message, and thus, there is no first message for the retrofit device to receive. PO Resp. 56 (citing Ex. 2028 ¶ 108). As discussed above, we find that Munoz discloses the first message in limitation 1.1. Accordingly, we find that Petitioner has shown by a preponderance of the evidence that Munoz in combination with Negley, Bosch, and SAE teach the message identifier limitation of claim 3.

For claim 4, Petitioner contends that a POSITA would have understood that Munoz's retrofit roof control module 100 would have retransmitted a second CAN message, indistinguishable from the first CAN message, to allow "factory-installed roof 110 to perform its original, pre-existing features as originally programmed." Pet. 28 (citing Ex. 1003 ¶ 167). Petitioner also presents arguments and evidence that Munoz teaches the limitations of claim 5. Pet. 28.

Patent Owner asserts that Munoz's teachings that the module does nothing when it is off (Ex. 1004, Fig. 3) supports that it does not retransmit messages according to the limitation of claim 4. Furthermore, Patent Owner argues that because Munoz does not teach the limitations of claim 1, it fails to teach the limitations of dependent claim 5. We disagree for the reasons discussed above in determining that the references teach the limitations of

claim 1. In particular we note that Munoz's teachings regarding the startup of devices does not show persuasively that the Munoz device does not retransmit messages after the initial start of the device during the subsequent functions described in Munoz. *See* Reply 24; Ex. 1004, 6:43–44.

Based on the full record, we determine that Munoz, Negley, Bosch, and SAE teach the limitations of claims 2–5 by a preponderance of the evidence.

3. Independent Claim 6

Independent claim 6 recites, *inter alia*, "a retrofit apparatus connected to the vehicle data bus including a second processor programmed to transmit a second message which mimics the first message through a second data bus." Ex. 1001, 11:50–53.

Petitioner contends that a POSITA would have understood that "a first CAN message . . . intended . . . to operate the factory-installed roof 110 would have been received by the retrofit roof control module 100, and the retrofit roof control module 100 would have transmitted a second CAN message, indistinguishable from the first CAN message (i.e., a mimic of the first message)." Pet. 31 (citing Ex. 1003 ¶ 174).

Patent Owner contends that "Munoz's cabriolet top open/close buttons would be wired directly to (or be part of) the roof control electronics 110. There is no 'roof open' first message that could be spoofed." PO Resp. 58 (citing Ex. 2028 ¶ 111). Patent Owner also argues that "the second message could be a diagnostic command, i.e. one which does not originate from a factory installed device." PO Resp. 58 (citing Ex. 2024, 69:13; Ex. 2028, ¶¶ 103–105). As discussed above, we do not agree with Patent Owner's arguments regarding the direct connection of the buttons in Munoz based on

the alleged implementation of Munoz in a particular vehicle. *See* Ex. 2030; Ex. 2028 ¶¶ 103–105. Furthermore, we are not persuaded that Munoz teaches the use of diagnostic commands for the reasons discussed above. Thus, we find that Petitioner presents sufficient and persuasive evidence that Munoz teaches the second data bus and the message mimicking of claim 6. Pet. 28–31.

Patent Owner also argues that Munoz does not teach adding a second data bus, and instead teaches segments of a single bus. PO Resp. 59, Ex. 2028 ¶ 112. For the reasons discussed above for limitation 1.3, we find that Petitioner has persuasively shown that Munoz teaches adding a separate communication data bus.

Based on the full record, Petitioner provides sufficient and persuasive argument and evidence that Munoz in combination with Negley, Bosch, and SAE teaches the limitations of claim 6 by a preponderance of the evidence.

4. Dependent Claims 7–9

Petitioner provides a limitation-by-limitation comparison of the prior art to each of claims 7–9. Pet. 32–34 (citing Ex. 1003 ¶¶ 56, 64, 122–148, 176, 178; Ex. 1004, 1:26-40, 1:50–53, 2:65–3:21, 6:20–40; Ex. 1010, 3, 13, 45–46; Ex. 1006, 6–7, 9–12, Figs. 3, 6). Petitioner provides citations to the references and declarant testimony to support that Munoz, with Negley, Bosch, and SAE, teach the limitations of claims 7–9. *Id.*; Ex. 1003 ¶¶ 176–180.

Patent Owner addresses dependent claim 7 but does not address claims 8 and 9. PO Resp. 60. With respect to claim 7, Patent Owner argues that Munoz does not disclose a roof open and close command and asserts that Munoz uses of diagnostic commands and not the required assigned

message identifiers. PO Resp. 60. For the reasons discussed with respect to claim 1 and 3, we are not persuaded by Patent Owner's arguments based on diagnostic commands. Based on the full record, Petitioner provides sufficient argument and evidence that Munoz in combination with Negley, Bosch, and SAE teaches the limitations of claims 7–9 by a preponderance of the evidence.

5. Independent Claim 10

Claim 10 recites, *inter alia*, "a retrofit apparatus, operatively connected to the vehicle data bus, including a second processor programmed to send a second message having the same message identifier." Ex. 1001, 12:15–18.

Petitioner contends that "Munoz's retrofit roof control module 100 processor is programmed to send a second message having the same message identifier as a first message from original dashboard 105 for the same reasons already detailed above for . . . Claim 1." Pet. 36–37 (citing Ex.1003 ¶ 187). Petitioner presents detailed argument and citation to the evidence that Munoz teaches the limitations of claim 10. Pet. 34–37; Ex. 1003 ¶¶ 122–148, 184–189; Ex. 1006, 9, Fig. 6.

Patent Owner disagrees relying on the same arguments presented above with respect to claims 1 and 3. PO Resp. 60–61; Ex. 2028 ¶¶ 115, 116, 119. For the reasons discussed above with respect to claim 1 and 3, we determine that Petitioner provides sufficient and persuasive argument by a preponderance of the evidence that an ordinarily skilled artisan would understand that Munoz in combination with Negley, Bosch, and SAE teaches the limitations of claim 10. Pet. 35–36.

6. Dependent Claims 11–15, 19

Petitioner provides a persuasive limitation-by-limitation comparison of each of claims 11–13 with the cited references. Pet. 37–38; Ex. 1003 ¶¶ 183–191. Patent Owner relies on the same arguments addressed above that Munoz (1) fails to teach the first message and cannot teach the indistinguishable second message, and (2) teaches a single common bus. PO Resp. 61–62. For the reasons discussed above with respect to claims 1 and 3, we determine that Petitioner establishes by a preponderance of the evidence that Munoz in combination with Negley, Bosch, and SAE teach the limitations of claims 11–13.

With respect to claim 14, Petitioner asserts that SAE discloses a gateway in a CAN bus that "communicates with two CAN chips, one from each network" and includes "bridging standard messages without translation." Pet. 39 (quoting Ex. 1009, 4). Petitioner asserts that:

> Box 115 in Munoz's Fig. 1 directs that an open switch 120 terminates the bus connection between second factory-installed apparatus 105 and first factory-installed apparatus 110. All subsequent communications between the first factory-installed apparatus 110 and the vehicle data bus "A" pass through the retrofit roof control module 100 acting as a "gateway" according to a POSITA's understanding of that term. Leale, ¶¶ 134–138, 144, 196.

Pet 39.

Patent Owner argues that the references cited by Petitioner explicitly teach away from software-implemented gateways and rather teaches that gateways must be dedicated devices. PO Resp. 63 (citing Ex. 1015, 1–2; Ex. 2028 ¶ 121). We disagree. The cited reference compares gateways, including their respective advantages, but it does not rise to the level of teaching away from specific gateways by discouraging particular

implementations. Ex. 1015, 1, 4, 5, 7; *see Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1069 (Fed. Cir. 2018); *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004).

As discussed above, we find that Petitioner has persuasively shown that Figure 1 of Munoz shows all subsequent communications between the factory installed apparatus 110 and the vehicle bus A pass through the retrofit control module and may alter or replace messages. *See* Pet. 39; Ex. 1004, 3:50–4:23, Fig. 1 (100). Patent Owner acknowledges that Munoz describes removing or altering data from the CAN bus, even as Patent Owner argues against the methods Petitioner asserts are used to remove or alter such messages. PO Resp. 20. In addition, Patent Owner's declarant acknowledges that that "[i]f there are two different buses, it would be a legitimate reason to have a – a gateway between these two buses." Ex. 1020, 85:11–13. As discussed above, we find that Munoz teaches two different buses connected through the retrofit apparatus. Accordingly, we agree with Petitioner that Munoz in combination with Negley, Bosch, and SAE teaches a gateway in accordance with claim 14 by a preponderance of the evidence.

With respect to claim 15, which requires selectively suppressing forwarding messages, Petitioner provides sufficient and persuasive argument and evidence that Munoz in combination with Negley, Bosch, and SAE teaches the limitations of claim 15. Pet. 39–41. Petitioner relies on testimony from Petitioner's declarant that a POSITA would understand that Munoz suppresses errors in the message identifier, overruns in message traffic, and speed data or other signals. Pet. 40; Ex. 1003 ¶¶ 198–199.

Patent Owner argues that "[s]peed data or other signals relating to vehicle motion are not input signals from factory buttons, switches, and knobs" and that Munoz's claims show its device is not allowed to receive these signals. PO Resp. 64; Ex. 2028 ¶ 125; Ex. 1004, 8:22–23, 9:59–60. As discussed above, Patent Owner concedes that Munoz describes removing data from the CAN bus. PO Resp. 20. On the full record, we credit Petitioner's declarant that removing data teaches suppressing of messages in accordance with claim 15 by a preponderance of the evidence. Pet. 40; Ex. 1003 ¶¶ 198–199.

With respect to claim 19, Petitioner provides argument that Munoz teaches the second data bus consistent with the arguments and evidence presented for claim 1. Pet. 41; Ex. 1003 ¶ 207. Patent Owner argues that, for the same reasons presented with respect to claim limitation 1.3 above, Munoz fails to teach the second data bus of claim 19. PO Resp. 64. On the full record and for the reasons discussed above, we find that Petitioner has persuasively shown that Munoz in combination with Negley, Bosch, and SAE teaches the limitations of claim 19 by a preponderance of the evidence.

7. Conclusion: Claims 2–15 and 19

Based on the record before us, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 2–15 and 19 would have been obvious over the combined teachings of Munoz, Negley, Bosch, and SAE.

G. Obviousness over Munoz, Negley, SAE, Bosch, and Lobaza

For dependent claims 16–18, all of which ultimately depend from claim 10, Petitioner maps the limitation of each claim to the combined teachings of Munoz, Negley, SAE, Bosch, and Lobaza. Pet. 32–34.

Petitioner cites Lobaza as teaching or suggesting an object detection systems to detect objects in the frontal area of a vehicle, an automatic braking system, and a parking aid. Pet. 41 (citing Ex. 1014, 4:43–49). The Petition also provides articulated reasoning to support the motivation to combine Lobaza's object detection and parking aid systems that were known to those of skill in the art with Munoz's application for vehicle systems. Pet. 41–42; Ex. 1003 ¶¶ 202–204, 208, 211; Ex. 1014, 2:4–10, 4:42–49; Ex. 1004, 4:55–5:2.

Patent Owner argues that Petitioner's arguments fail for the same reasons discussed above with respect to Munoz, Negley, SAE and Bosch teaching the limitations of claim 10. PO Resp. 65. Based on the full record, we determine Petitioner provides sufficient argument and evidence that Munoz, Negley, SAE, Bosch, and Lobaza teach the limitations of claims 16–18.

We determine that Petitioner has demonstrated by a preponderance of the evidence that claims 16–18 would have been obvious over Munoz in combination with Lobaza and Munoz, Negley, SAE, Bosch, and Lobaza.

H. Obviousness over Dietz, Negley, SAE, and Bosch

1. Dietz

Dietz discloses an installation manual for a multimedia interface that processes data from the CAN-protocol of a vehicle. Ex. 1005, 2. Dietz describes a 1280 Multimedia Interface device added to a vehicle that allows playback of video through the factory-installed vehicle navigation screen. Ex. 1003 ¶ 214; Ex. 1005, 2–3.

2. Claims 1–15, 19

Petitioner provides detailed argument and evidence mapping the limitations of claim 1 to Dietz, Negley, SAE, and Bosch. Pet. 43–51; Ex. 1003 ¶¶ 214–240. We find that Petitioner provides sufficient articulated reasoning and rationale to combine Dietz, which communicates over a vehicle CAN bus, with the CAN bus disclosures in Negley, SAE, and Bosch. Pet. 43–44. Petitioner also maps the limitations of claims 2–15 and 19 to the teachings of Dietz, Negley, SAE, and Bosch. Pet. 51–63; Ex. 1003 ¶¶ 242–306.

Petitioner contends that Dietz discloses limitation [1.3], "adding a second data bus to the vehicle," because the Dietz's "retrofit module includes wiring (pins 1, 2, 5, 6) providing a second data bus." Pet. 49 (citing Ex. 1005, 2; Ex. 1016[10]; Ex. 1003 ¶¶ 229–234).

Petitioner also contends that Dietz discloses limitation [1.6], "transmitting a second message from the retrofit apparatus to the factory-installed first apparatus through the second data bus, the second message being indistinguishable from the first message," Petitioner asserts that "a POSITA would understand that Dietz spoofs a message from a vehicle motion module on the OEM control bus to indicate to the navigation unit that the vehicle is not in motion when the vehicle is in motion." Pet. 50 (citing Ex. 1003 ¶ 237).

In our Decision on Institution, we found Petitioner provided insufficient evidence to support the conclusions regarding Dietz's functions of monitoring and altering gear shift signals. Dec. 27. Petitioner's Reply

[10] Ex. 1016 is Petitioner's annotated version of the Figure on page 3 of Dietz.

does not address the deficiencies in Petitioner's challenges based on Dietz. *See generally*, Pet. Reply.

On the full record, we agree with Patent Owner that Dietz does not adequately describe data or messaging sufficient to support that a skilled artisan would understand the CAN-protocol messaging. PO Resp. 65–66; Ex. 2028 ¶ 130. Thus, we are not persuaded on the full record that Dietz described messaging and protocols used to carry out its features sufficient to carry Petitioner's burden. Petitioner's arguments are not supported sufficiently to show that Dietz in combination with Negley, SAE and Bosch teaches the limitations of claims 1–15 and 19. *See* PO Resp. 66–72. Accordingly, we maintain our findings from the Decision on Institution that Petitioner has not shown by a preponderance of the evidence that Dietz, Negley, SAE, and Bosch teach the limitations of independent claims 1, 6 and 10. Dec. 27.

I. Obviousness over Dietz, Negley, SAE, Bosch, and Lobaza

For dependent claims 16–18, Petitioner's arguments and evidence rely on the arguments mapping Dietz, Negley, SAE, and Bosch to independent claim 10. Pet. 63–65. For the reasons discussed above with respect to claim 10 involving Dietz, Petitioner has not shown by a preponderance of the evidence that Dietz, Negley, SAE, and Bosch teach the limitations of claim 16–18.

III. CONCLUSION[11]

For the reasons given, based on the arguments and evidence of record, Petitioner has met its burden to prove by a preponderance of the evidence that (1) claims 1–15, and 19 are unpatentable under 35 U.S.C. § 103(a) as obvious over Munoz, Negley, SAE , and Bosch; and (2) claims 16–18 are unpatentable under 35 U.S.C. § 103(a) as obvious over Munoz, Negley, SAE, Bosch, and Lobaza. Petitioner has not established by a preponderance that (1) claims 1–15, and 19 are unpatentable under 35 U.S.C. § 103(a) as obvious over Dietz , Negley, SAE, and Bosch; and (2) claims 16–18 are unpatentable under 35 U.S.C. § 103(a) as obvious over Dietz, Negley, SAE, Bosch, and Lobaza.

[11] Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this Decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

The table below summarizes our conclusions:

Claim(s)	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–15, 19	103(a)	Munoz, Negley, SAE, Bosch	1–15, 19	
16–18	103(a)	Munoz, Negley, SAE, Bosch, Lobaza	16–18	
1–15, 19	103(a)	Dietz , Negley, SAE, Bosch		1–15, 19
16–18	103(a)	Dietz , Negley, SAE, Bosch, Lobaza		16–18
Overall Outcome			1–19	

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IV. ORDER

Accordingly, it is:

ORDERED that claims 1–19 of the ’671 patent are determined to be unpatentable; and

FURTHER ORDERED that, because this is a final written decision, parties to this proceeding seeking judicial review of our Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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