

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UNIFIED PATENTS, LLC,
Petitioner,

v.

AUTOBRILLIANCE, LLC,
Patent Owner.

IPR2020-00354
Patent 6,792,351 B2

Before KEN B. BARRETT, TIMOTHY J. GOODSON, and
MATTHEW S. MEYERS, *Administrative Patent Judges*.

MEYERS, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. Background and Summary

Unified Patents, LLC, (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of claims 1, 2, and 4–7 of U.S. Patent No. 6,792,351 B2 (Ex. 1001, “the ’351 patent”). AutoBrilliance, LLC, (“Patent Owner”) filed a Preliminary Response. Paper 7. With our authorization, the parties filed additional pre-institution briefing. See Paper 8; Paper 9. We instituted an *inter partes* review on claims 1, 2, and 4–7 on all grounds asserted in the Petition. See Paper 10 (“Dec. on Inst.”). After institution of trial, Patent Owner filed a Patent Owner Response (Paper 18, “PO Resp.”), Petitioner filed a Reply (Paper 21, “Pet. Reply”), and Patent Owner filed a Sur-Reply (Paper 26, “Sur-Reply”).¹ We held a hearing on April 12, 2021, a transcript of which is included in the record. See Paper 39 (“Tr.”).

We have authority under 35 U.S.C. § 6. Petitioner bears the burden of proving unpatentability of the challenged claims, and the burden of persuasion never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). To prevail, Petitioner must prove unpatentability by a preponderance of the evidence. See 35 U.S.C. § 316(e) (2018); 37 C.F.R. § 42.1(d) (2019). This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons discussed below, we determine that Petitioner has shown by

¹ With our authorization, Petitioner filed a list of allegedly improper sur-reply arguments (see Paper 29) and Patent Owner responded. Paper 31. We have considered these submissions, but we determine that it is unnecessary to resolve these disputes because even without excluding any arguments in the Sur-Reply, we still find for Petitioner on the merits.

a preponderance of the evidence that claims 1, 2, and 4–7 of the '351 patent are unpatentable.

B. Real Parties in Interest

Unified Patents indicates that it alone is the real party-in-interest, and that “no other party exercised control or could exercise control over Unified’s participation in this proceeding, the filing of this petition, or the conduct of any ensuing trial.” Pet. 1. Patent Owner indicates that it alone is the real party-in-interest. Paper 5, 1.

C. Related Matters

Petitioner and Patent Owner each state that the '351 patent is involved in *AutoBrilliance, LLC v. Toyota Motor Corporation et al., LLC*, Case 4-19-cv-00712 (E.D. Tex.). Pet. 1; Paper 5, 1. We note that this case was dismissed without prejudice on March 4, 2020. *AutoBrilliance*, Case 4-19-cv-00712, Dkt. 10.

II. BACKGROUND

A. The '351 Patent

The '351 patent, titled “METHOD AND APPARATUS FOR MULTI-VEHICLE COMMUNICATION,” issued on September 14, 2004. Ex. 1001, code (54), (45). The '351 patent discloses a communication system that transmits, receives, and relays messages between vehicles. *Id.* at 2:5–8. More particularly, the '351 patent describes that its system transmits messages to vehicles within reception range of a communication portal. *Id.* at 2:2–6. Once a vehicle receives the message, the vehicle may then relay the message to other vehicles. *Id.* at 2:6–8. The '351 patent discloses that “[t]he message 24 continues to be relayed by vehicles receiving the message 24,” and thus, the message may “be propagated directly point-to-point to

multiple vehicles along roadway 12 without having to use a cellular or satellite communication infrastructure.” *Id.* at 2:8–12.

In one embodiment, the ’351 patent discloses that its communication system transmits “recall messages or other messages associated with certain vehicles.” *Id.* at 2:14–18. For example, a message transmitted by a portal or another vehicle may include a VIN or “any vehicle identifier or user identifier” that identifies vehicles associated with the message. *Id.* at 2:37–43. Once the message is received, a processor “compares a stored vehicle identifier with the identifier contained in the received message.” *Id.* at 2:43–45. After processing, “[i]f the message identifier matches the vehicle identifier, the message is reported to a vehicle operator or a reply message is sent back in block 36.” *Id.* at 2:46–48. And, “[i]f the message identifier does not match some stored identifier associated with the vehicle, the message is either discarded or stored in a message buffer in block 38.” *Id.* at 2:53–56.

In another embodiment, the ’351 patent describes that its communication system can update digital route maps using information transferred between vehicles. *Id.* at 4:54–61. Figure 6, reproduced below, shows how map routes are automatically updated for different road conditions.

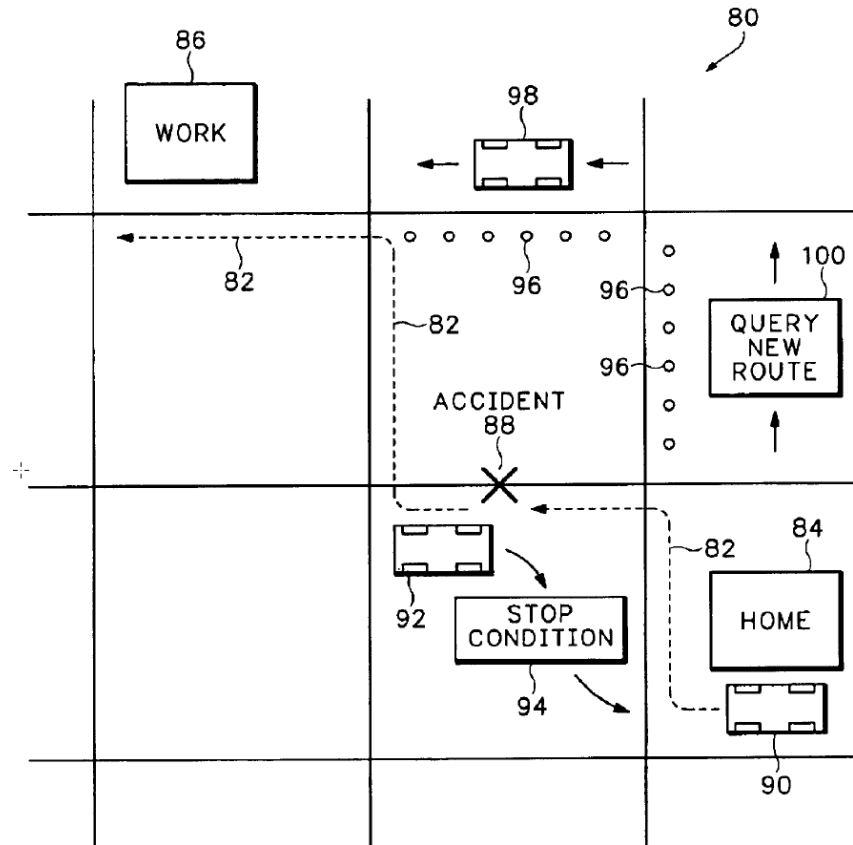


Figure 6 “is a diagram showing how map routes are automatically updated for different road conditions.” Ex. 1001, 1:55–56.

Figure 6 shows vehicle 90 on direct route 82 from home 84 to work 86, accident 88, stopped vehicle 92, message 94, and new route 96. *Id.* at 4:43–67. The ’351 patent describes that a “vehicle 92 that is actually traveling along route 82 may detect the event 88 either using vision sensors that detect a collision or using speed and velocity sensors that detect vehicle 92 in a stop or slow down condition.” *Id.* at 4:48–51. In that situation, the “event detected by vehicle 92 is transmitted in a message 94 to vehicle 90.” *Id.* at 4:51–53. According to the ’351 patent, the navigation system “initially generates the preferred route 82 for vehicle 90 in block 108,” but then “compares the route with any messages . . . received from other vehicles. If messages 94 indicate a traffic stoppage event 88 along the original route 82,

the navigation system generates a new route 96 (FIG. 6) for vehicle 90 around the event 88 in block 112.” *Id.* at 4:54–61.

B. Illustrative Claims

Petitioner challenges claims 1, 2, and 4–7 of the ’351 patent. Pet. 3. Claims 1 and 4 are independent claims. Challenged claim 2 depends directly from claim 1, and challenged claims 5–7 depend directly from claim 4. Independent claims 1 and 4 are reproduced below.

1. A method for processing messages in a vehicle, comprising:
receiving a message containing a message identifier;
comparing the message identifier to [a] vehicle identifier;
processing the message according to the comparison between the
message identifier and the vehicle identifier; and
storing the message in memory located in the vehicle and
periodically transmitting the stored message from the
vehicle to other vehicles.

Ex. 1001, 6:17–26.

4. A method for using an electronic map, comprising:
identifying an original route using the electronic map;
receiving messages identifying events associated with the
original route;
identifying a new route according to the identified events; and
receiving the messages from vehicles traveling along the original
route.

Id. at 6:49–56.

C. Asserted Grounds of Unpatentability

Pursuant to 35 U.S.C. § 314(a), on July 7, 2020, we instituted *inter partes* review on all grounds asserted in the Petition, namely:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
4–7	103(a) ²	Shyu, ³ Kiendl ⁴
4, 6	102(e)	King ⁵
4, 6	103(a)	King
1, 2	103(a)	Shyu, Yoshida ⁶

See Pet. 12–65. Petitioner also relies on testimony from Christopher K. Wilson. Ex. 1003 (“Wilson Decl.”). Patent Owner relies on testimony from Dr. Steven Goldberg. Ex. 2002 (“Goldberg Decl.”). Mr. Wilson was cross-examined. See Ex. 2001 (deposition transcript of Christopher K. Wilson, “Wilson Dep.”); see also Ex. 1019 (final deposition transcript of Christopher K. Wilson, “Final Wilson Dep.”).⁷

III. ANALYSIS

A. *Principles of Law*

To prevail in its challenges to Patent Owner’s claims, Petitioner must demonstrate by a preponderance of the evidence that the claims are unpatentable. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d) (2019). A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between

² The relevant sections of the Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, took effect on March 16, 2013. Because the application that issued as the ’351 patent was filed before March 16, 2013, we apply the pre-AIA version of §§ 102 and 103.

³ US 5,428,544, issued June 27, 1995 (Ex. 1004, “Shyu”).

⁴ WO 00/46777, published August 10, 2000 (Ex. 1006, “Kiendl,” a certified translation from the original publication in German).

⁵ US 6,351,709 B2, issued Feb. 26, 2002 (Ex. 1005, “King”).

⁶ US 5,699,056, issued Dec. 16, 1997 (Ex. 1012, “Yoshida”).

⁷ According to Petitioner, Patent Owner “filed a rough version of Mr. Wilson’s deposition transcript as EX2001. For accuracy, Unified submits the final version of that deposition transcript as EX1019.” Pet. Reply 4, n. 2. When addressing Patent Owner’s arguments that point to Exhibit 2001, our decision identifies where the relied upon portions may also be found in Exhibit 1019.

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.⁸ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. Level of Ordinary Skill in the Art

We review the grounds of unpatentability in view of the understanding of a person of ordinary skill in the art at the time of invention. *Graham*, 383 U.S. at 17. Petitioner asserts one of ordinary skill in the art “would have had a bachelor’s degree in computer science, computer engineering, electrical engineering, or a related subject, and one to two years of work experience with navigation systems.” Pet. 6 (citing Ex. 1003 ¶¶ 36–39). Patent Owner does not dispute Petitioner’s assertion or otherwise argue that that it would affect the merits of the case. *See* PO Resp. 2 (“Patent Owner does not dispute Petitioner’s characterization of the level of ordinary skill in the art, as it is not dispositive.”).

We accept the assessment offered by Petitioner as it is consistent with the ’351 patent and the asserted prior art. We further note that the prior art of record in the instant proceeding reflects the appropriate level of ordinary

⁸ Patent Owner presents no objective indicia in its papers. *See generally* PO Resp.; PO Sur-Reply.

skill in the art. *Cf. Okajima v. Bourdeau*, 261 F.3d 1350, 1354–55 (Fed. Cir. 2001) (the prior art itself may reflect an appropriate level of skill in the art).

C. Claim Construction

In an *inter partes* review for a petition filed on or after November 13, 2018, “[claims] of a patent . . . shall be construed using the same claim construction standard that would be used to construe the [claims] in a civil action under 35 U.S.C. 282(b), including construing the [claims] in accordance with the ordinary and customary meaning of such [claims] as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” *See* 37 C.F.R. § 42.100(b) (2019); *see also Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc). “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1015, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

In our Institution Decision, we discussed the term “message.” Neither party has indicated that our interpretation was improper, and we do not perceive any reason or evidence that now compels any deviation from our initial interpretation. Accordingly, we maintain that the term “message,” in the context of the ’351 patent, may include a “message identifier,” but is not limited to being “a message having a location identifier.” *See, e.g.*, Ex. 1001, 5:48–55 (discussing identification field 130).

We further determined in our Institution Decision that we did not need to construe the terms “events” and “message identifier” or any other claim terms explicitly at that stage of the proceeding. Dec. on Inst. 10–14. We invited the parties to further address the proper constructions of those terms

during trial. *Id.* at 14. In its Response, Patent Owner addresses claim constructions for the terms “events” and “message identifier.” PO Resp. 2–3. In its Reply, Petitioner addresses constructions for the same terms addressed by Patent Owner. Pet. Reply 1–2.

With the full record now before us, we determine that there is no dispute that requires us to expressly construe the term “message identifier.” Patent Owner does not dispute that the cited art teaches this element in the context of the challenged claims. *See generally* PO Resp.; Sur-Reply. Thus, we determine that we need only construe the term “events” as recited in claim 4. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017); *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.”).

I. “events”

Petitioner asserts that “a POSITA would have understood the meaning of the term ‘event’ to include at least any one of ‘an accident, a traffic stoppage, an average speed of travel for the vehicle over some period of time or for a particular segment, speed information, or collision information.’” Pet. 11 (citing Ex. 1003 ¶¶ 43–47). According to Petitioner, this understanding is consistent with the ’351 patent Specification. *Id.* at 10–11 (citing Ex. 1001, 4:45–61, 5:13–15, 6:65–67).

In its Response, “Patent Owner objects to Petitioner’s proposed construction to the extent it deviates from the plain and ordinary meaning of ‘events,’” but offers no other explanation. PO Resp. 2. In its Reply, Petitioner maintains its position. Pet. Reply 1 (citing Pet. 10–11).

In its Sur-Reply, Patent Owner argues, for the first time, that Petitioner’s proposed construction is incorrect because one of ordinary skill in the art “would understand speed information is not an ‘event,’ but rather simply information about the vehicle’s travel—in comparison to, for example, an accident which is an ‘event’ as claimed.” Sur-Reply 1. According to Patent Owner, the ’351 patent discloses “that ‘a real-time event, such as an accident 88, may happen along path 82 that requires a vehicle 90 to take an alternate route.’” *Id.* at 2 (quoting Ex. 1001, 4:45–47). Patent Owner explains that this sentence “tells us that an event is something that can ‘happen.’ An accident can ‘happen.’ The average speed of a vehicle, by contrast, does not ‘happen.’” *Id.* Patent Owner acknowledges that the ’351 patent describes “traffic events” (*id.* at 2 (citing Ex. 1001, 5:10–17)), but argues that it is improper to “construe the term ‘events’ to include the disclosed ‘traffic events’” because doing so would be inconsistent with the plain and ordinary meaning of the term “events.” *Id.* at 3.

Having reviewed and considered the record presented, including Petitioner’s and Patent Owner’s proposed constructions, we reject Patent Owner’s proposed construction. We find Patent Owner’s contention that the term “events” must be narrowly construed to exclude “traffic events” from its meaning to be unsupported by, and inconsistent with, the ’351 patent’s disclosure. As discussed in greater detail below, we find the record supports construing “events” to include traffic events.

The ’351 patent discloses that an “event” may be an accident, i.e., “a real time event, such as an accident 88,” that “may happen along path 82 that requires a vehicle 90 to take an alternate route.” Ex. 1001, 4:45–47. However, the ’351 patent also discloses that “events” may include “traffic

stoppage events” (*id.* at 4:48–61) and “traffic events.” *Id.* at 5:11–12 (“The traffic events may include average speed of travel for the vehicle over some period of time or for a particular segment along path 96.”). We note that the ’351 patent identifies both of these events interchangeably as “event 88.” For instance, the ’351 patent refers to an accident, i.e., “accident 88,” in one example and “traffic stoppage event 88” in another example. *Id.* at 4:45–47, 4:58–67. We also note that claim 6 of the ’351 patent, which depends from claim 4, sets forth that “events include speed information or collision information from vehicles traveling along the original route.” *Id.* at 6:65–67.

Patent Owner’s proposed construction would require us to import the term “accident” into the construction of the term “event” based on exemplary language in the ’351 patent’s Specification, i.e., “a real time event, *such as* an accident 88.” Ex. 1001, 4:45–47 (emphasis added). We do not find the argument persuasive because it would exclude other types of disclosed events and “there is a strong presumption against a claim construction that excludes a disclosed embodiment.” *See In re Katz Interactive Call Processing Patent Litig.*, 639 F.3d 1303, 1324 (Fed. Cir. 2011); *Oatey Co. v. IPS Corp.*, 514 F.3d 1271, 1277 (Fed. Cir. 2008) (“[W]here claims can reasonably [be] interpreted to include a specific embodiment, it is incorrect to construe the claims to exclude that embodiment, absent probative evidence on the contrary.”).

Nonetheless, Patent Owner argues that construing “events” to include “traffic events” is still improper because the ’351 patent “distinguishes between an ‘event’ and its consequences, e.g., traffic stoppage. An accident is an ‘event’; the average speed of the vehicle is at best a consequence of an event.” Sur-Reply 2. However, Patent Owner’s argument is inconsistent

with the '351 patent's disclosure. For instance, in one example, the '351 patent describes providing an alternate route due to an accident, i.e., "a real time event, such as an accident 88, may happen along path 82 that requires a vehicle 90 to take an alternate route." Ex. 1001, 4:45–47. And in another example, the '351 patent describes providing a new route in response to a traffic stoppage event, i.e., "[i]f the messages 94 indicate a traffic stoppage event 88 along the original route 82, the navigation system generates a new route 96 (FIG. 6) for vehicle 90 around the event 88 in block 112." *Id.* at 4:58–61. Thus, we find that Patent Owner's analysis of the '351 patent's Specification does not support its theory that it is improper to "construe the term 'events' to include the disclosed 'traffic events.'" Sur-Reply 3.

Patent Owner's argument is also inconsistent with the language of claim 6. As discussed above, claim 6, which depends from claim 4, recites that "events include speed information or collision information." Ex. 1001, 6:65–67. From this, one of ordinary skill in the art would understand that the term "events," as used in claim 4, is not so limited as to exclude "traffic events." Therefore, we find that Patent Owner's proposed construction for "events" is not supported by the claim language of the '351 patent. Accordingly, we construe the term "events" to include "traffic events" such as those described in the '351 patent Specification. Because our construction of "events" is sufficient to resolve the issues presented in this proceeding, no further construction of this term is necessary. *See Nidec*, 868 F.3d at 1017.

D. Alleged Obviousness over Shyu and Kiendl (Ground 1: Claims 4–7)

Petitioner asserts that claims 4–7 are unpatentable as obvious over Shyu and Kiendl. Pet. 12–38; Pet. Reply 3–22. Petitioner also relies on the

testimony of Mr. Wilson to support its arguments. Pet. 12–38; Pet. Reply 3–22. Patent Owner, relying on the testimony of Dr. Goldberg, responds to Petitioner’s assertions. PO. Resp. 4–22; Sur-Reply 4–13; Ex. 2002.

We begin our discussion with a brief summary of Shyu and Kiendl and then address the evidence and arguments presented.

1. Overview of Shyu (Ex. 1004)

Shyu is directed to a system for getting “traffic information and using the information to navigate,” where the vehicle acquires traffic status information from the vehicle in front of it “by means of information transference from the passing vehicles.” Ex. 1004, 1:9–14. More particularly, Shyu’s system equips vehicles “with an apparatus” to collect and interchange data, i.e., “traffic information such as the driving speed and the path,” with other vehicles while following or passing. *Id.* at 1:58–66. These data exchanges enable Shyu’s system to “achieve navigation by incorporating map data and traffic information” between vehicles without the use of “any central computer, satellites or roadside posts.” *Id.* at 1:54–57, 1:64–66.

In Shyu’s system, each “vehicle is equipped with an electronic map device which can display digitized road map information and identification of the position of the vehicle on the map.” *Id.* at 3:5–8. The device “comprises a map-drawing module 181 and a navigation module 182. The map-drawing module 181 generates the map and displays it with the indicator 8 (on the screen 81 shown in FIG. 4) based on information 110 of the position and direction of the vehicle.” *Id.* at 5:5–12. Shyu’s “navigation module 182” provides “driving forecast and speed-control instruction,” “searches for all the available paths based on road information 121” (e.g., speed limit, allowed directions) and “front-vehicle information 151” (e.g.,

average driving speed), and “calculates the driving times for all the available routes respectively, and constructs several better timesaving routes displayed on the map for reference.” *Id.* at 5:38–49.

2. *Overview of Kiendl (Ex. 1006)*

Kiendl, a translated version of a German-language PCT application published on August 10, 2000. Ex. 1006, code (43). Petitioner asserts that Kiendl is prior art to the ’351 patent “under at least 35 U.S.C. § 102(a), (b).” Pet. 3.⁹

Kiendl is directed to “a self-organizing traffic information system and/or traffic guidance system” that obtains “relevant traffic information” and dynamically optimizes “a route of a first vehicle” based on the acquired traffic information. Ex. 1006, 1:7–14, 3:19–23. According to Kiendl, its system “allows for an autonomous, self-organizing traffic information network in which the participating vehicles at the same time generate, distribute, bundle and utilize the required information.” *Id.* at 4:4–7.

⁹ At oral argument, Patent Owner argues for the first time that Petitioner did not make a prima facie showing that Kiendl is prior art. *See* Tr. 57:1–4; *see also id.* at 56:11–13 (“First I want to mention that it doesn’t seem like the petitioners actually met their burden of making a prima facie showing that Kiendl is actually prior art.”). This argument is untimely. We do not consider arguments raised for the first time during oral arguments. *See Dell Inc. v. Acceleron, LLC*, 884 F.3d 1364, 1369 (Fed. Cir. 2018) (“Unless it chose to exercise its waiver authority under 37 C.F.R. § 42.5(b), the Board was obligated to dismiss Dell’s untimely argument given that the untimely argument in this case was raised for the first time during oral argument.”); *accord* Consolidated Trial Practice Guide 85–86 (“No new evidence and arguments. *During an oral hearing, a party may rely upon appropriate demonstrative exhibits as well as evidence that has been previously submitted in the proceeding, but may only present arguments relied upon in the papers previously submitted.*” (italics added)).

Kiendl's system utilizes "on-board sensors" in a first vehicle, where the data from the sensors may be stored, and transmitted to other vehicles, and data from sensors in other vehicles, which may be received, stored, and retransmitted. *Id.* at 3:19–4:2. Kiendl discloses that

[t]ransmitted data may include information concerning a signal type, a vehicle identification, the utilized transmitting field strength, a location of the vehicles, an unambiguous action code, as well as a list of identifications of previously used transmitter vehicles in the form of a history list, whereby first information contents are defined.

Id. at 9:29–10:2. Kiendl further discloses that the transmitted data may also "include information concerning way segment identifications, a moving direction, a proportion of a covered way segment, a mean speed, a maximum speed, the vehicle density, and/or an up-to-dateness/time marking of the information, whereby second information contents are defined." *Id.* at 10:4–8. Kiendl still further discloses that the transmitted data may include information regarding "a particular event" such as accidents and distress calls. *Id.* at 14:6–10, 29:8–14.

With these various transmitted data, Kiendl's system is able to create an optimized route for a first vehicle based on its traffic guidance system. *Id.* at 15:4–27. Kiendl discloses that "[t]he route of the first vehicle from its current position to a selected target is determined by means of stored way data, and the route is subdivided into way segments." *Id.* at 6:24–26. During travel, "[t]he first vehicle can transmit inquiries for information relating to a practicability and other traffic-relevant quantities on candidate way segments to be travelled later on." *Id.* at 6:28–30. Kiendl discloses that replies to inquiries may be delivered directly to the first vehicle where they are stored, accumulated, and processed for retransmission or utilization at

the first vehicle. *Id.* at 7:1–6. More particularly, Kiendl discloses that “[t]he travel history data, source data, buffer memory data which in particular contain the stored, accumulated and processed information, and reply data in the vehicles may each be stored in an individual map structure superseding a static global map structure or existing in parallel therewith.” *Id.* at 7:8–12; *see also id.* at 7:15–17 (“[I]t is possible to also create, modify or delete new map structure elements in the individual map structure data.”). In this regard, Kiendl discloses that its route optimization system performs “[a] first calculation of the route of the first vehicle from its current position to a selected target” and then performs a recalculation of the route “based on modified data in the individual map structure for the purpose of iterative optimization of the route.” *Id.* at 8:1–11.

3. *Analysis of Claim 4*

Petitioner asserts claim 4 is unpatentable as obvious over Shyu and Kiendl. Pet. 12–27; Pet. Reply 3–12. Patent Owner contends that Petitioner has failed to establish that limitations [4.2] and [4.4] are taught by the references. PO Resp. 4–14; Sur-Reply 3–9. Petitioner’s contentions regarding the preamble and limitations [4.1] and [4.3] are undisputed. We have reviewed the evidence and arguments provided by the parties and are persuaded that Petitioner has demonstrated by a preponderance of the evidence that claim 4 is unpatentable as obvious over Shyu and Kiendl.

We use Petitioner’s notations to identify the claim elements.

a) [4.0] A method for using an electronic map, comprising:

Petitioner asserts that Shyu discloses a system for transmitting traffic information between vehicles “‘equipped with an **electronic map** device which can display **digitized road map** information’ using ‘a digitized map.’” Pet. 16 (citing Ex. 1004, Abstract, 1:52–54, 3:5–8, 4:51–53, Fig. 4).

Petitioner further asserts that Shyu discloses using the electronic map via input commands. Pet. 17–18 (citing Ex. 1004, 4:64–5:2, 5:49; Ex. 1003 ¶¶ 64–68). We find that Petitioner’s contentions, which Patent Owner does not dispute, are persuasive in demonstrating that Shyu discloses the preamble to the extent it is limiting.

b) [4.1] identifying an original route using the electronic map

Petitioner asserts that Shyu discloses “a navigation module” for “providing a path indication and a driving instruction.” Pet. 18 (citing Ex. 1004, 7:14–18). Petitioner further asserts that “[t]he output of the navigation module is ‘a line indicated on the displayed **map** showing **an optimum route** for said first navigatable vehicle.’” *Id.* According to Petitioner,

[a] POSITA would have recognized the “optimum route” indicated on the display map when the user initially enters a destination corresponds to an identified original route because Shyu describes a process of updating routes, and accordingly, a first displayed “optimum route” (before a subsequent update) would correspond to the original route recited in claim 4.

Pet. 18 (citing Ex. 1003 ¶¶ 71–72) (emphases omitted); *see also* Pet. 18 (citing Ex. 1003 ¶¶ 69–73 (“[B]y describing the display of an optimum route on a map, *Shyu* discloses, or at least renders obvious, *identifying an original route using the electronic map*.”)). We find that Petitioner’s contentions, which Patent Owner does not dispute, are persuasive in demonstrating that Shyu discloses this limitation to an ordinarily skilled artisan.

c) [4.2] receiving messages identifying events associated with the original route¹⁰

Petitioner asserts that Shyu's system "continuously **receive[s]** traffic information" from other vehicles. Pet. 19 (citing Ex. 1004, 2:59–60, 4:28–29, 5:59–60, Fig. 3). Petitioner asserts "that the 'traffic information' includes events such as 'the driving path and **speed.**'" Pet. 20 (citing Ex. 1004, 2:22–24). Petitioner explains that in Shyu,

"the traffic information of the vehicle itself as well as of other vehicles" is transmitted by the transmitting vehicle using the following format: "<starting code, code of the vehicle itself, traffic information about the vehicle itself; code of another vehicle 1, traffic information of the vehicle 1 itself; code of the other vehicle 2, traffic information of the vehicle 2 itself; . . . ; code of another vehicle n, self-traffic information of the vehicle n, ending code.>"

Pet. 20 (citing Ex. 1004, 3:49–59) (alteration in original). According to Petitioner,

[a] POSITA would have understood that the traffic information transferred using the above format corresponds to a plurality of messages; as Mr. Wilson explains, each pair of code and traffic information elements within the format above constitutes a message, and Shyu describes at least two vehicles each sending at least one message (e.g., the message from vehicle 1, and the message from vehicle 2).

Pet. 20 (citing Ex. 1003 ¶¶ 76–77) (emphases omitted); *see also* Pet. 25 (citing Ex. 1003 ¶ 87) ("[A] POSITA would have understood as including multiple events, at least because Shyu refers to traffic information sent by multiple passing vehicles, each of which would send a message corresponding to an event." (emphases omitted)).

¹⁰ The analysis for limitation [4.2] also addresses aspects related to limitation [4.4].

Petitioner maintains that the “average driving speed” information transmitted between vehicles in Shyu constitutes “events associated with the original route.” Pet. 21 (emphasis omitted). However, Petitioner also relies on Kiendl as disclosing “additional types of events.” *Id.* (emphasis omitted). More particularly, Petitioner asserts that Kiendl discloses “a ‘method . . . for dynamically obtaining relevant traffic information and/or for dynamic optimization of a route of a first vehicle,’ and describes broadcasts that include ‘**events such as, e.g., accidents (activation of an airbag, etc.) and distress calls.**’” Pet. 21–22 (citing Ex. 1006, 3:19–21, 29:8–10) (alteration in original). Petitioner takes the position that the combined system of Shyu and Kiendl “would result in a navigation system that would determine its ‘available paths’ based on ‘front-vehicle information’ that included both the driving speed of a path, as disclosed by Shyu, as well as other information such as accidents, as provided by Kiendl’s teachings.” Pet. 22 (citing Ex. 1003 ¶ 80) (emphases omitted). Petitioner explains that one of ordinary skill in the art would have been motivated to combine Shyu and Kiendl because doing so “would have been no more than the combination of prior art elements according to known methods to yield predictable results” and “each element of Shyu and Kiendl would operate with no change in their respective functions.” Pet. 22–23 (citing Ex. 1003 ¶ 81). Petitioner further explains that one of ordinary skill in the art “would have recognized the desirability of including additional types of events that occur along a route, e.g., accident and distress calls as described in *Kiendl* into the method and system of *Shyu*.” Pet. 23–24 (citing Ex. 1003 ¶ 82).

In response, Patent Owner contends that the combination of Shyu and Kiendl fails to disclose or suggest “receiving messages identifying events associated with the original route.” PO Resp. 4–14; Sur-Reply 3–9. Patent

Owner first argues that Petitioner fails to establish that Shyu discloses or suggests “receiving messages.” PO Resp. 11–14; Sur-Reply 3–5. Patent Owner next argues that Shyu “fails to disclose that the messages identify events ‘associated with the original route’ or are ‘received from vehicles traveling along the original route.’^[11]” Sur-Reply 6–8; *see also* PO Resp. 4–10. In the Sur-Reply, Patent Owner argues, for the first time, that the combination of Shyu and Kiendl fails to disclose “events.” Sur-Reply 8–9. We address each argument in turn.

(1) “receiving messages”

Patent Owner argues that Shyu fails to disclose or suggest “receiving messages.” PO Resp. 11–14; Sur-Reply 3–5. More particularly, Patent Owner asserts that Petitioner fails to establish that Shyu discloses receiving “at least two messages,” as required by claim 4. Sur-Reply 3. According to Patent Owner, “Petitioner’s argument relies on its expert’s speculative extrapolation of a single data structure disclosed in Shyu to a plurality of ‘messages’ allegedly received by a vehicle.” PO Resp. 11 (citing Pet. 18–20; Ex. 1003 ¶¶ 76–77). Patent Owner asserts that Petitioner’s expert “was clear that the only position his testimony supports is one in which the multiple message[s] are those that are included within a single transference.” *Id.* (citing Ex. 2001, 57:23–58:3).¹² To support its position, Patent Owner reproduces the following question and answer from Mr. Wilson’s testimony:

¹¹ We note that the language “received from vehicles traveling along the original route” is recited in limitation [4.4].

¹² We note this same portion of the Wilson Deposition is also found in Exhibit 1019 at 64:11–15, which Patent Owner cites in its Sur-reply. Sur-reply 5.

Q. So it's your understanding there that in the situation in which there are multiple messages those multiple messages are included within a single transference?

A. Yes.

Id.

Patent Owner's arguments do not persuade us that Mr. Wilson's testimony supports only a single transference including multiple messages. As Petitioner correctly notes, "Mr. Wilson's statement[] d[oes] not preclude the fact that a plurality of messages are received from multiple passing vehicles regardless of whether they were relayed by the sending vehicle to the receiving vehicle in a single transference or multiple transferences." Pet. Reply 4 (citing Ex. 1019, 64:11–15) (emphasis omitted). Petitioner provides the following copy of Figure 1 of Shyu, annotated to include "an additional vehicle a_0 (purple) traveling in front of vehicle a_1 (green)." Pet. Reply 6.

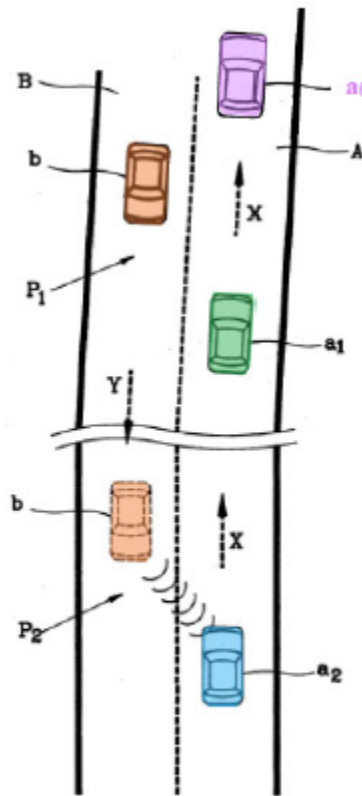


FIG. 1

Figure 1, annotated, “shows an example of the invented method in which the traffic information of a first vehicle is transferred via a second vehicle to a third vehicle.” Ex. 1004, 2:3–5.

Relying on Mr. Wilson’s deposition testimony together with the annotated copy of Figure 1, Petitioner asserts that:

In this example, Shyu’s vehicle *b* (orange) would have passed vehicle *a*₀ (purple) first and received its traffic information. EX1019, 53:12–54:3. Then, as vehicle *b* (orange) continued to drive, it would have passed vehicle *a*₁ (green) and received its traffic information. *Id.* Vehicle *b* (orange) would then combine the traffic information **received separately from vehicles *a*₀ (purple) and *a*₁ (green)** into a transference that is sent to vehicle *a*₂ (blue). That is, vehicle *b* (orange) concatenates multiple individual messages including traffic information from vehicle *a*₀ (purple) and traffic information from vehicle *a*₁ (green)

into a transference that is sent to vehicle a_2 (blue). *Id.* Thus, vehicle a_2 (blue) receives multiple messages in the transference from vehicle b (orange).

Pet. Reply 6–7 (emphasis added); *see also* Ex. 1019, 53:19–22 (Vehicle B “would have then proceeded on down the road and received code of the vehicle itself and traffic information about the vehicle itself from Vehicle A1 being a different vehicle.”).

We find Petitioner and Mr. Wilson’s explanation to be consistent with Shyu’s disclosure. For example, Shyu discloses that “[t]he whole system, switched on, will continuously receive traffic information sent by the passing vehicles and update the information 151; therefore, it may refresh aforesaid better route displays at intervals, such as every 10 seconds.” Ex. 1004, 5:59–63. We credit Mr. Wilson’s testimony that one of ordinary skill in the art would have understood the aforementioned portion of Shyu “as including multiple events, at least because Shyu refers to *traffic information sent by multiple passing vehicles, each of which would send a message* corresponding to an event.” Ex. 1003 ¶ 87. Patent Owner’s expert, Dr. Goldberg does not dispute Mr. Wilson’s understanding. *See, e.g.*, Ex. 2002 ¶¶ 52–56 (discussing the entirety of Dr. Goldberg’s patentability analysis of claim 4). Thus, we find that Petitioner has provided sufficient evidence that Shyu discloses “receiving messages” as required by claim 4.

(2) “*receiving messages identifying events associated with the original route*”

Patent Owner argues that the combination of Shyu and Kiendl “fails to disclose that the messages identify events ‘associated with the original route’ or are ‘received from vehicles traveling along the original route.’” Sur-Reply 6–8; *see also* PO Resp. 4–10. More particularly, Patent Owner argues that Petitioner fails to establish that Shyu discloses the argued

limitations “because Petitioner cannot establish that vehicles a_0 and a_1 are in fact traveling on the original route as claimed.” Sur-Reply 8; *see also* PO Resp. 10 (“Petitioner’s expert does not make clear that ‘messages’ in Shyu come from vehicles that were on the original route when the message was sent.”). We are not persuaded by Patent Owner’s argument.

Instead, we agree with Petitioner that “Shyu discloses relaying traffic information which includes *events* such as “the driving path and **speed**” from vehicles traveling in front of the receiving vehicle, i.e., *associated with the original route*.” Pet. Reply 7–8 (footnote omitted) (citing Pet. 20–21 (citing Ex. 1004, 2:22–32; Ex. 1003 ¶¶ 78–79)); *see also* Pet. 26–27 (citing Ex. 1004, 3:66–68; Ex. 1003 ¶¶ 76–77, 91–95) (addressing limitation [4.4]). In this regard, Shyu discloses

[t]he vehicle a_1 in the front on road A sends its traffic information, such as the driving path and speed, to the passing-by vehicle b at a position P_1 . When the vehicle b passes on the vehicle a_2 in the rear of the road A at a position P_2 later, the traffic information of the vehicle a_1 will then be sent to the vehicle a_2 by the vehicle b. As a result, the vehicle a_2 obtains the traffic status (e.g. the average driving speed of a certain path) in front according to the information it gets.

Ex. 1004, 2:23–32. We credit Mr. Wilson’s testimony that this disclosure demonstrates that one of ordinary skill in the art “would have recognized that, because vehicle a_2 is traveling on road A, it is part of the *vehicle’s original route*, and that events occurring on road A are *associated with the route*.” Ex. 1003 ¶ 79.

Patent Owner responds that that Petitioner fails to adequately establish that Shyu discloses the argued limitations because the theory set forth in the Petition is “contrary to Petitioner’s expert’s testimony.” PO Resp. 7–10. More particularly, Patent Owner argues that Petitioner’s expert, Mr. Wilson,

testifies that Shyu discloses “receiving the messages from vehicles traveling along the original route” even though he “acknowledges that his opinion relies on a characterization of Shyu that **doesn’t change** even when the receiving vehicle and the information-source vehicle are on **different roads.**” PO Resp. 9 (citing Ex. 2001, 61:12–19¹³); Sur-Reply 6–8. We disagree with Patent Owner.

Instead, we agree with Petitioner that Patent Owner improperly “focuses on Mr. Wilson’s testimony that Shyu ‘**includes** a situation where vehicle b passes [a₁] and then subsequently vehicle b passes vehicle [a₂] whether those are on the same road or different roads is immaterial to my understanding of the figure.” Pet. Reply 8 (citing PO Resp. 9 (citing Ex. 2001, 61:12–19¹⁴)). As Petitioner correctly notes, “there is no limitation that a route cannot include multiple roads” or anything in the claims that “precludes the receiving vehicle from receiving other information in addition to information identifying events associated with the original route.” *Id.* (emphases omitted). For the reasons given by Petitioner and summarized above, we find that the combination of Shyu and Kiendl discloses argued limitations [4.2] and [4.4].

(3) “events”

Patent Owner argues that “traffic information including ‘events’ such as ‘the driving path and speed’” disclosed in Shyu fails to constitute the term “events,” as properly construed. Sur-Reply 8. Patent Owner further argues that although “Kiendl discloses transmitting ‘event-type’ information about

¹³ We note this same portion of the Wilson Deposition is also found in Exhibit 1019 at 69:2–12.

¹⁴ We note this same portion of the Wilson Deposition is also found in Exhibit 1019 at 69:2–12.

accidents such as the activation of an airbag as well as distress calls” (*id.* (citing Ex. 1006, 8:8–10)), one of ordinary skill in the art would understand that “the transmitting vehicle is no longer “traveling along the original route.” *Id.* at 8–9.

However, as discussed *supra* in Part III.C.1., we construe the term “events” to include “traffic events” such as those described in the ’351 patent Specification. Here, in at least one example, the ’351 patent identifies an “event” as “traffic stoppage event 88.” Ex. 1001, 4:58–61. We credit Mr. Wilson’s testimony that, in light of the ’351 patent, one of ordinary skill in the art “would have understood the meaning of the term ‘event’ to include any one of ‘an accident, a traffic stoppage, an average speed of travel for the vehicle over some period of time or for a particular segment, speed information, or collision information.”” Ex. 1003 ¶ 47; *see also id.* ¶¶ 45–46 (citing Ex. 1001, 4:45–61, 5:13–15, 6:65–67) (identifying “events” contemplated by the ’351 patent). Thus, we find Shyu discloses events under the construction discussed above. *See, e.g.*, Pet. 20 (citing Ex. 1004, 2:22–24 (“[T]he ‘traffic information’ includes events such as ‘the driving path and speed.’”) (emphases omitted)), *Id.* at 21 (citing Ex. 1004, 2:28–32) (“In this way, ‘vehicle a₂ obtains the traffic status (e.g. **the average driving speed of a certain path**) in front.”).

Even if Shyu does not explicitly disclose “events,” Kiendl describes that its “event-type information” may include “particular events such as, e.g., accidents (activation of an airbag, etc.) and distress calls.” Ex. 1006, 29:8–10. Patent Owner argues that one of ordinary skill in the art

would understand the activation of an airbag and distress calls are sent by the car involved in the “event.” But neither Petitioner nor its expert explain how this relates to vehicle a₁ – the vehicle Petitioner identifies as “traveling along the original route” and

from which Petitioner contends the “messages identifying events” are received. Indeed, having been involved in an accident, the transmitting vehicle is no longer “traveling along the original route” – it is not traveling anywhere at all.

Sur-Reply 8–9.

We have considered Patent Owner’s argument, but do not find it to be persuasive. Patent Owner’s assertion that a stopped vehicle is no longer “traveling along the original route” amounts to attorney argument, unsupported by any testimony from Dr. Goldberg or other evidence. Instead, we agree with Petitioner that “the 351 Patent allows for vehicles traveling along the route to be stopped.” Tr. 16:19–20. For example, the ’351 patent discloses that a stopped vehicle 92 may be able to transmit a message. Ex. 1001, 4:62–67 (“One report from stopped vehicle 92 may not be enough to cause the navigation System in vehicle 90 to generate a reroute 96.”).

For these reasons, we find that the combination of Shyu and Kiendl discloses “events” under the construction set forth *supra* in Part III.C.1.

d) [4.3] identifying a new route according to the identified events

Petitioner asserts that the combination of Shyu and Kiendl renders obvious this limitation. Pet. 24–26. Petitioner asserts that Shyu’s system constructs “better time-saving routes” based on “continuously receive[d] traffic information sent by the passing vehicles.” Pet. 24 (citing Ex. 1004, 5:46–49, 5:60–61; Ex. 1003 ¶ 87) (emphasis omitted, alteration in original).

Petitioner explains that

[a] POSITA would have recognized that the displayed better routes are the identified *new route[s]* and displaying one of the better routes corresponds to *identifying a new route*, because a POSITA would have understood that an initial route displayed on *Shyu’s* route would be replaced by a new route, i.e., a

refreshed or better time-saving route, as explained by *Shyu* at 5:60–63.

Pet. 25 (citing Ex. 1003 ¶¶ 85–86) (second alteration in original). We find that Petitioner’s contentions regarding this limitation, which Patent Owner does not dispute, are persuasive.

e) [4.4] receiving the messages from vehicles traveling along the original route

Petitioner asserts that the combination of *Shyu* and *Kiendl* renders obvious this limitation. Pet. 26–27. Petitioner asserts *Shyu* discloses “that the receiving vehicle receives traffic information from multiple vehicles that are in front of the receiving vehicle.” Pet. 27 (citing Ex. 1003 ¶¶ 91–95); *see also* Pet. 26–27 (citing Ex. 1004, 3:67–68 (“**[T]raffic information about vehicles 1 to n** was transferred to the receiving vehicle.”), 3:66–67 (“**[V]ehicles 1 to n** are those in front of the receiving vehicle.”). Patent Owner does not present any additional argument for limitation [4.4] other than the argument that we have already considered with respect to limitation [4.2]. We find that Petitioner’s contentions regarding this limitation are persuasive.

For the foregoing reasons, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 4 would have been obvious in view of *Shyu* and *Kiendl*.

f) Analysis of Claim 5

Claim 5 recites “[a] method according to claim 4 including: sending out queries for events associated with the original route, receiving messages identifying events associated with the original route; and selecting the new route according to the identified events for the original route.” Ex. 1001, 6:49–56.

Petitioner asserts that claim 5 would have been obvious over Shyu and Kiendl. Pet. 27–33; Pet. Reply 12–14. Petitioner asserts that Kiendl discloses “that ‘**requests** relating to the moving data for the route sections are **dispatched via the transmitter**/receiver means of the vehicles.’” Pet. 28 (citing Ex. 1006, 20:14–16). Petitioner further asserts that “the moving data in *Kiendl* is similar to *Shyu*’s traffic information” (Pet. 28 (citing Ex. 1003 ¶ 100)), and “by teaching ‘requests’ or ‘inquiries’ that are ‘dispatched via the transmitter’ for data related of the route sections, such as events that occur on the route sections, *Kiendl* teaches *sending out queries for events*.” Pet. 28 (citing Ex. 1003 ¶ 101).

Petitioner explains that one of ordinary skill in the art “would have been motivated to improve *Shyu*’s method and apparatus to include the capability to send requests for traffic information from other vehicles for several reasons.” Pet. 29 (citing Ex. 1003 ¶ 102). Petitioner first asserts that incorporating Kiendl’s ability to send a request for information would allow the receiving vehicle in Shyu to obtain optimal traffic information. Pet. 29 (citing Ex. 1003 ¶ 103). Petitioner next asserts that Kiendl describes that requests relating to moving data are “costly in the sense that it brings about a communication volume or a communication expenditure.” Pet. 30 (citing Ex. 1006, 20:16–21). Consistent with this disclosure, Petitioner asserts that one of ordinary skill in the art “would have recognized that incorporating the capability to request traffic information would lead to a vehicle that can request traffic information on [an] as needed basis” (Pet. 30) which would help conserve vehicle computing resources for other tasks. *Id.* (citing Ex. 1003 ¶¶ 104–105). Petitioner also asserts that incorporating Kiendl’s requests into Shyu’s navigation system would have been an obvious use of a known technique. Pet. 30–31 (citing Ex. 1003 ¶ 106). Petitioner still further

asserts that “issuing a request for traffic information would have been obvious to try for a POSITA to reduce communication volume among the vehicles.” Pet. 31 (citing Ex. 1006, 20:16–21; Ex. 1003 ¶ 106).

Petitioner performs a similar analysis for the remaining limitations of dependent claim 5 with reference to limitations [4.2], [4.3], and [4.4] discussed above. Pet. 32–33.

In response, Patent Owner contends that “Petitioner’s suggested combination of Shyu and Kiendl would be completely incapable of ‘sending out queries for events associated with the original route,’ as recited in challenged dependent claim 5.” PO Resp. 14. According to Patent Owner, “Petitioner ignores the fact that the transmitter of Kiendl ha[s] no knowledge of the original route. Thus, there is no reason for one of ordinary skill in the art to read either Shyu or Kiendl as disclosing ‘sending out queries for events associated with the original route.’” *Id.* at 15.

Petitioner responds that Patent Owner improperly

alleges that the query must be implemented in a manner to request **only** information for *events associated with the original route*. [PO Resp. 14–16]. But the claim does not contain any such negative limitation. The query only needs to be implemented in a manner to request information that **includes** *events associated with the original route*. And [Patent Owner] does not argue that *Shyu* as modified by *Kiendl* fails to include such a query. *Id.*

Pet. Reply 13. Petitioner also notes that “Kiendl discloses that that the queries are “requests relating to the moving data for the route sections.” Pet., 28 (quoting EX1006, 20:14–16). Thus, *Kiendl* teaches that that the queries are specific to particular route segments.” Pet. Reply 13–14.

In response, Patent Owner argues that Petitioner's interpretation is contradicted by the language of claim 5 and “simply ignores the ‘original

route’ requirement, instead only requiring a request for events.” Sur-Reply 9–10. Patent Owner further contends that Petitioner’s argument that “Kiendl discloses ‘requests relating to the moving data for the route sections’” is a new position, which was not identified in the Petition. *Id.* at 10 (citing Pet. Reply 13).

We agree with Petitioner that the language of claim 5 does not preclude a receiving vehicle from receiving additional information, in response to “queries for events associated with the original route,” that would include information identifying “events associated with the original route,” but also identifying events at other locations. *See* Pet. Reply 13 (“The query only needs to be implemented in a manner to request information that **includes** *events associated with the original route.*”).

We also disagree with Patent Owner’s contention that Petitioner’s reference to Kiendl’s disclosure regarding “requests relating to the moving data for the route sections’” in the Reply Brief is a new position. Petitioner asserts that Kiendl discloses “that ‘requests relating to the moving data for the route sections are dispatched via the transmitter/receiver means of the vehicles.’” Pet. 28 (citing Ex. 1006, 20:14–16). Petitioner further asserts that “the moving data in *Kiendl* is similar to *Shyu*’s traffic information” (*id.* at 28 (citing Ex. 1003 ¶ 100)), and “by teaching ‘requests’ or ‘inquiries’ that are ‘dispatched via the transmitter’ for data related of the route sections, such as events that occur on the route sections, *Kiendl* teaches *sending out queries for events.*” *Id.* (citing Ex. 1003 ¶ 101). We agree with Petitioner that “Kiendl teaches . . . that the queries are specific to particular route segments.” Pet. Reply 13–14.

Patent Owner further argues that:

Even under Petitioner’s strained understanding of Shyu, Shyu’s traffic information is only organized by time, not location. (*See, e.g.*, EX1004, 3:5–59.) The proxy vehicle in Shyu cannot therefore respond specifically to any query for events “associated with the original route,” as the proxy vehicle does not know what the original route is. (*Id.*)

PO Resp. 16. However, as Petitioner correctly notes, “Shyu’s traffic information includes the necessary information for determining and sending information related to particular route sections.” Pet. Reply 14 (citing Ex. 1004, 3:27–33; Ex. 1019, 44:15–45:2, 48:21–49:5). Thus, Patent Owner’s argument is not persuasive.

For the foregoing reasons, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 5 would have been obvious in view of Shyu and Kiendl.

g) Analysis of Claim 6

Claim 6 recites “[a] method according to claim 4 wherein the events include speed information or collision information from vehicles traveling along the original route.” Ex. 1001, 6:65–67.

Petitioner asserts that claim 6 would have been obvious over Shyu and Kiendl. Pet. 33–34. Petitioner asserts that Shyu discloses that its system “receives events that include speed and accident information,” as discussed with reference to limitations [4.2] and [4.4]. *Id.* (citing Ex. 1004, 2:22–24; Ex. 1003 ¶¶ 113–118) (emphasis omitted). Petitioner further asserts that Kiendl discloses “events such as, e.g., accidents (activation of an airbag, etc.) and distress calls.” Pet. 33 (quoting Ex. 1006, 29:8–10). Petitioner explains that it would have been obvious to include Kiendl’s collision information into Shyu’s traffic information for the reasons discussed with respect to limitation [4.2]. Pet. 34 (citing Ex. 1003 ¶ 116).

Patent Owner does not present any argument for claim 6 other than what we have already considered with respect to claim 4. After considering the evidence and arguments of record, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 6 would have been obvious in view of Shyu and Kiendl.

h) Analysis of Claim 7

Petitioner asserts claim 7 would have been obvious over Shyu and Kiendl. Pet. 34–38. For example, claim 7 recites “[a] method according to claim 4 including: receiving messages from different vehicles traveling over the original route.” Ex. 1001, 7:1–3. Petitioner asserts that Shyu discloses that “traffic information (*messages*) is received from *different vehicles* such as ‘**vehicles 1 to n** . . . in front of the receiving vehicle.’” Pet. 35 (citing Ex. 1004, 3:66–67; Ex. 1003 ¶¶ 120–122).

Claim 7 further recites “selecting the new route according to the messages from the different vehicles most recently traveling the original route.” Ex. 1001, 7:4–6. Petitioner first asserts that

as discussed in [4.3] and [4.4], *Shyu* renders obvious that one of the “better time-saving routes” corresponds to a new route identified *according* to the received traffic information formatted as the *messages*. *Shyu* further discloses that “[t]he result, depending on the **user’s selection** through key punching, can be constructed into several displays.” *Shyu* (EX1004), 5:56–59. The “result” in *Shyu* corresponds to the selected *new route*. *Id.* at 5:46–59. Accordingly, *Shyu* renders obvious *selecting the new route according to the messages*.

Pet. 35–36 (citing Ex. 1003 ¶¶ 124–125) (alteration in original). Petitioner further asserts that Shyu’s navigation system “**continuously receive[s] traffic information** sent by the passing vehicles and . . . may refresh aforesaid better route displays at intervals, such as every 10 seconds.”

Pet. 36 (citing Ex. 1004, 5:59–63) (alteration in original). According to Petitioner, “[b]ecause the navigation system in *Shyu* teaches continuously receiving traffic information about vehicles 1 to n in the front of the receiving vehicle, *Shyu* renders obvious *selecting the new route according to the messages from the different vehicles most recently traveling the original route.*” Pet. 38 (citing Ex. 1003 ¶¶ 123–129).

In response, Patent Owner contends that the combination of *Shyu* and *Kiendl* fails to disclose or suggest the subject matter claim 7. PO Resp. 17–22; Sur-Reply 13–18. Patent Owner first argues that *Shyu* fails to disclose or suggest “receiving messages from different vehicles traveling over the original route.” PO Resp. 17. Patent Owner argues next that *Shyu* fails to disclose or suggest “selecting the new route according to the messages from the different vehicles most recently traveling the original route.” PO Resp. 18–22; Sur-Reply 13–18. We address each argument in turn.

(1) “*receiving messages from different vehicles traveling over the original route.*”

Patent Owner asserts that Petitioner fails to establish that the “‘messages’ in *Shyu* come from vehicles that were on the original route when the message was sent” because vehicle b “is travelling in the opposite direction.” PO Resp. 17 (citing Ex. 2002 ¶ 68). Patent Owner also argues that “*Shyu* does not address whether or not the vehicles 1 to n were actually on the original route when they passed messages to vehicle b.” *Id.* (citing Ex. 2002 ¶ 69).

At the outset, we agree with Petitioner that “the claims do not require that the *different vehicles* send the *messages* directly to the receiving vehicle without any intermediaries.” Pet. Reply 14. Petitioner provides the

following copy of Figure 1 of Shyu, annotated to include “an additional vehicle a_0 (purple) traveling in front of vehicle a_1 (green).” Pet. Reply 16.

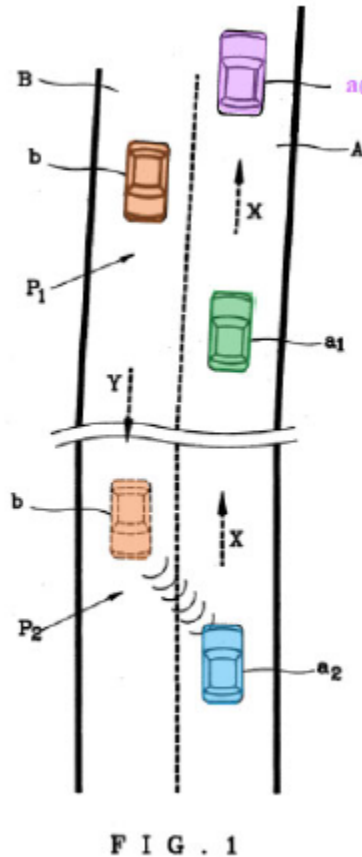


Figure 1, annotated, “shows an example of the invented method in which the traffic information of a first vehicle is transferred via a second vehicle to a third vehicle.” Ex. 1004, 2:3–5.

Petitioner’s annotated Figure 1 demonstrates that even though vehicle b may be travelling in the opposite direction on path Y , it is passing information from different vehicles, e.g., vehicles a_1 and a_0 , that are travelling in front of vehicle a . Vehicle a_2 is following the same path X on the same road A , and thus, “traveling over the original route,” as required by claim 7. Ex. 1004, 2:19–34. We credit Mr. Wilson’s testimony that one of ordinary skill in the art “would have understood that *Shyu*’s vehicles that are

“in front of the receiving vehicle” would include at least those vehicles traveling on the same road (e.g., highway) as the receiving vehicle, and accordingly correspond to *different vehicles traveling over the original route.*” Ex. 1003 ¶ 121.

We also disagree with Patent Owner’s contention that “Shyu does not address whether or not the vehicles 1 to n were actually on the original route when they passed messages to vehicle b.” PO Resp. 17. Instead, we find that Shyu discloses that “[t]he vehicles 1 to n are those in front of the receiving vehicle” and “[t]he traffic information about vehicles 1 to n was previously gotten from adjacent passing vehicles.” Ex. 1004, 3:66–68. Therefore, when a vehicle 1 to n passes messages to vehicle b, the vehicle 1 to n, was on the original route. *See also* Ex. 1019, 79:15–20 (“The example in figure one -- I don't know that in my description of this the Vehicle A2 is presumed to have a route that it is currently on. That’s called at the original route. And that route is identified by that Vector X I guess in front of A2 and then beyond that.”).

(2) *“selecting the new route according to the messages from the different vehicles most recently traveling the original route.”*

Patent Owner argues that Petitioner fails to establish that Shyu discloses or suggests “selecting the new route according to the messages from the different vehicles most recently traveling the original route.” PO Resp. 17–22; Sur-Reply 13–18. According to Patent Owner, in Shyu, “the receiving vehicle can only receive and evaluate the most recently received data structure,” but “[t]he most recently received data structure only contains data from the most recently passed proxy vehicle, not the vehicle most recently traveling the original route. There is nothing in Shyu that

would teach or suggest that the data structure is in any way related to the ‘original route.’” PO Resp. 20 (emphasis omitted).

Petitioner replies that “in the scenario when vehicles a_0 (purple), a_1 (green), and a_2 (blue) are all traveling on road A, as shown in annotated Figure 1 above, vehicle b (orange) passes vehicle a_0 first, then vehicle a_1 , and then vehicle a_2 .” Pet. Reply 18 (citing Ex. 1004, 2:20–34; Pet. 20–21; Ex. 1003 ¶¶ 78–79; Ex. 1019, 53:12–54:3). Petitioner explains that

[w]hen the originally planned route includes vehicle a_2 (blue) continuing to travel down past the locations where vehicle b (orange) passed vehicle a_0 (purple) and vehicle a_1 (green), then the traffic information received from vehicles a_1 (green) and a_0 (purple) is *from the different vehicles . . . traveling the original route*. EX1019, 111:10–22. Furthermore, when vehicle b (orange) does not pass any other vehicles between vehicle a_0 (purple) and vehicle a_2 (blue), vehicles a_0 (purple) and a_1 (green) *are the different vehicle most recently traveling the original route*. Pet., 36–38; EX1003, ¶¶127–29. That is, the closest vehicles directly in front of the receiving vehicle (a_2 (blue)) are the different vehicles most recently traveling the original route. Because *Shyu*’s system uses the data received *most recently* (e.g., the data received in the last 10 seconds) to update its route, the data received . . . from the *different vehicles most recently traveling the original route* would be included in the computation for *selecting a new route*. Pet., 36–38; EX1003, ¶¶123–29.

Pet. Reply 18. According to Petitioner,

[t]he recitation of *selecting the new route according to the messages from the different vehicles most recently traveling the original route* refers back to recitation of *receiving messages from different vehicles traveling over the original route*, which provides the antecedent basis for *the messages from the different vehicles most recently traveling the original route*. That is, the time of *most recently* is determined from the *different vehicles traveling the original route* whose messages were received. Thus, **of** the *messages received from different vehicles traveling*

the original route, at least the messages from the different vehicles most recently traveling the original route are used to select[] the new route.

Id. at 19. We agree with Petitioner.

Patent Owner does not provide a persuasive explanation as to why the information received by proxy vehicle B from recently passed vehicle a_0 (purple) and vehicle a_1 (green), i.e., the closest vehicles traveling directly in front of receiving vehicle a_2 , are not “different vehicles most recently traveling the original route.” And, as discussed above, Shyu discloses that its system “will continuously receive traffic information sent by the passing vehicles and update the information 151; therefore, it may refresh aforesaid better route displays at intervals, such as every 10 seconds.” Ex. 1004, 5:59–63. In light of Shyu’s disclosure, we credit Mr. Wilson’s testimony that one of ordinary skill in the art

would have understood that *Shyu* uses the *most recent[]* data (e.g., the data received in the last 10 seconds) to update routes. This data would correspond to data received from multiple *vehicles most recently traveling the original route*, as the data would include the data of the vehicles in front of the receiving vehicle, transmitted to vehicle b and relayed to the receiving vehicle, within the last period of time.

Ex. 1003 ¶ 128.

In its Sur-Reply, Patent Owner asserts that “Petitioner’s contention is wrong as a matter of claim construction because it rewrites the claim to eliminate the requirement that the route is selected ‘according to’ such messages.” Sur-Reply 13. Patent Owner asserts that claim 7 “use[s] recentness to determine which messages to use in selecting the new route, e.g., by comparing the timestamps of messages corresponding to a same route segment.” Sur-Reply 14. Patent Owner further asserts, that

[w]ith Petitioner’s argument, all of the messages would be considered and the system would have to consider the traffic stoppage messages and the no traffic stoppage messages to make a decision. The combined system fails to disclose any method to make such a selection (and Shyu only teaches messages that include speed and direction information as a further example and fails to differentiate messages to consider or not consider based on recency).

Id. at 16.

We are not persuaded by Patent Owner’s interpretation because it contradicts the language of claim 7, which recites-in-part “selecting the new route according to the **messages**.” Ex. 1001, 7:5 (emphasis added). Patent Owner argues that under Petitioner’s reasoning “all of the messages would be considered . . . to make a decision” (Sur-Reply 16), yet other than requiring that the messages be “from the different vehicles most recently traveling the original route” (Ex. 1001, 7:5–7), claim 7 provides no mechanism that would serve to differentiate messages with the particularity Patent Owner suggests.

Patent Owner contends that claim 7 differentiates messages, in order to select the new route, by “comparing the timestamps of messages corresponding to a same route segment.” Sur-Reply 14; *see also* Tr. 38:16–19 (“If all you’re considering is stuff as it comes in, then the issue is you don’t need to pay attention to the recentness. You don’t need to look at the timestamps, for example, to compare them.”), 41:15–18 (“We’re going to look at the more recent ones, and not at the less recent ones. So, we’re going to look at those messages we received, look at those time stamps, and say, we’re going to look at these, and not those.”). However, claim 7 does not recite any limitation directed to a “timestamp.” We must be careful not to read a particular embodiment appearing in the written description into the

claim if the claim language is broader than the embodiment, as is the case here. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993). “Though understanding the claim language may be aided by the explanations contained in the written description, it is important not to import into a claim limitations that are not a part of the claim.” *SuperGuide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004). Thus, it would be improper for us to import from the description of this particular embodiment the additional limitation argued by Patent Owner for a “timestamp” into the language of claim 7.

We acknowledge that claim 7 does require some process to differentiate messages in order to consider “the messages from the different vehicles most recently traveling the original route.” However, Patent Owner has not provided a clear and persuasive explanation as to what this constitutes other than by importing limitations from the Specification into the claim. We find more credible Petitioner’s argument and Mr. Smith testimony that “[b]ecause *Shyu*’s system uses the data received *most recently* (e.g., the data received in the last 10 seconds) to update its route, the data received [] from the *different vehicles most recently traveling the original route* would be included in the computation for *selecting a new route*.” Pet. Reply 18 (citing Pet. 36–38; Ex. 1003 ¶¶ 123–129). By updating a better route “at intervals, such as every 10 seconds” (Ex. 1004, 5:59–63), *Shyu*’s navigation system discloses a process for differentiating messages in order to consider “the messages from the different vehicles most recently traveling the original route.” Thus, Patent Owner’s argument is not persuasive.

For the foregoing reasons, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 7 would have been obvious in view of *Shyu* and *Kiendl*.

E. Alleged Anticipation by or Obviousness over King (Grounds 2 and 3: Claims 4 and 6)

Because we determine that claims 4 and 6 are unpatentable obvious over Shyu and Kiendl, we do not reach the Petition’s second and third grounds of unpatentability over King.

F. Alleged Obviousness over Shyu and Yoshida (Ground 4: Claims 1 and 2)

Petitioner asserts that claims 1 and 2 are unpatentable as obvious over Shyu and Yoshida. Pet. 50–65; Pet. Reply 24–29. Petitioner also relies on the testimony of Mr. Wilson to support its arguments. *Id.* Patent Owner responds to Petitioner’s assertions. PO. Resp. 26–34; Sur-Reply 23–27.

1. Overview of Yoshida (Ex. 1012)

Yoshida “relates to a traffic information system for reporting traffic information including traffic jam information, accident information, weather information and the like to a vehicle traveling on a road.” Ex. 1012, 1:5–8. Yoshida discloses that on a vehicle, a “vehicle information area stores for each vehicle ID the preceding data, the current data, a traveling lane and the other information,” which is “transmitted at least twice at predetermined time intervals from the on-vehicle apparatus 3 on the vehicle 2. . . . The data include time data, position data and vehicle speed data.” *Id.* at 17:58–66.

2. Analysis of Claim 1

Petitioner asserts that claim 1 would have been obvious over Shyu and Yoshida. Pet. 50–65. Patent Owner contends that Petitioner has failed to establish that limitations [1.2] and [1.3] are taught by the references. PO Resp. 26–33; Sur-Reply 23. Patent Owner argues further that one of ordinary skill in the art would not have been motivated to combine the

references. PO Resp. 33–34; Sur-Reply 24–27. We have reviewed the evidence and arguments provided by the parties and are persuaded that Petitioner has demonstrated by a preponderance of the evidence that claim 1 is unpatentable as obvious over Shyu and Yoshida.

We use Petitioner’s notations to identify the claim elements.

a) [1.0] A method for processing messages in a vehicle

Petitioner asserts that Shyu discloses a system for transferring traffic information between vehicles to facilitate navigation of those vehicles.

Pet. 51 (citing Ex. 1004, 1:52–54). Petitioner further asserts that “*Shyu* discloses that ‘the traffic information from other vehicles is **received by a receiver 4 and decoded by a decoder 14 . . . stored in a passing-by vehicle information register 16 and is provided to the encoder 17 and the transmitter 7 to send out.**” Pet. 52 (citing Ex. 1004, 4:28–35).

According to Petitioner, “[a] POSITA would have recognized that *Shyu*’s receiving, decoding, storing, encoding, and/or transmitting of the traffic information corresponds to *processing messages* as recited.” Pet. 52 (citing Ex. 1003 ¶ 168). We find that Petitioner’s contentions, which Patent Owner does not dispute, are persuasive in demonstrating that Shyu discloses the preamble to the extent it is limiting.

b) [1.1] receiving a message containing a message identifier

Petitioner asserts that “*Shyu* discloses that ‘**the traffic information** from other vehicles is received by a **receiver 4.**’” Pet. 52 (citing Ex. 1004, 4:28–29). Petitioner explains that one of ordinary skill in the art would have recognized that the traffic information received from another vehicle corresponds to a message. Pet. 53 (citing Ex. 1003 ¶ 171). Petitioner further asserts Shyu discloses that

[t]he traffic information transferred among the vehicles includes the traffic information of the vehicle itself as well as of other vehicles” in the following format <starting code, code of the vehicle itself, traffic information about the vehicle itself; code of another vehicle 1, traffic information of the vehicle 1 itself; code of the other vehicle 2, traffic information of the vehicle 2 itself; . . . ; code of another vehicle n, self-traffic information of the vehicle n, ending code.>”

Pet. 53 (citing Ex. 1004, 3:49–59, 4:53–59). According to Petitioner, one of ordinary skill in the art “would have recognized that the code of the vehicle in the traffic information corresponds to a *message identifier* . . . because the vehicle code identifies the vehicle that is associated with the corresponding traffic information.” Pet. 53 (citing Ex. 1003 ¶¶ 172–173). We find that Petitioner’s contentions, which Patent Owner does not dispute, are persuasive in demonstrating that Shyu discloses this limitation to an ordinarily skilled artisan.

c) [1.2] *comparing the message identifier to [a] vehicle identifier*

Petitioner asserts that Shyu discloses storing “traffic information” (Pet. 55 (citing Ex. 1004, 4:30–33), and that in order “to avoid accumulating repeated information, **the information is stored based on the codes of the vehicles and is continuously updated.**” Pet. 55 (citing Ex. 1004, 4:41–43). According to Petitioner,

[a] POSITA would have recognized *Shyu*’s description of storing information based on the codes of the vehicles as an explicit disclosure of *comparing the message identifier to [a] vehicle identifier*. Specifically, a POSITA would have understood that, to update traffic information that is stored based on vehicle codes, the system would compare the vehicle code associated with traffic information received from a vehicle in a message, with vehicle codes that are already stored in the passing-by vehicle information register 16. This would prevent the passing-by vehicle from storing multiple instances of traffic

information from the same vehicle or “accumulating repeated information” as *Shyu* explains (at 4:41–43).

Pet. 55 (citing Ex. 1003 ¶¶ 177–180). Petitioner explains that Shyu’s system would examine the vehicle code associated with a received traffic information message, determine that the information associated with the vehicle code in that message does not exist in the passing-by vehicle information register (e.g., by comparing that vehicle code to vehicle codes in the register), and then store the traffic information associated with that vehicle code for passing along to other vehicles.

Pet. 56 (citing Ex. 1003 ¶ 180). We find that Petitioner’s contentions regarding this limitation are persuasive. Patent Owner’s rebuttal arguments regarding this limitations are discussed in the next subsection.

d) [1.3] processing the message according to the comparison between the message identifier and the vehicle identifier

Petitioner asserts Shyu discloses that in order “to avoid accumulating repeated information, **the information is stored based on the codes of the vehicles and is continuously updated.**” Pet. 57 (citing Ex. 1004, 4:41–43). Petitioner explains that “[a] POSITA would have recognized that updating the traffic information stored in the passing-by-vehicle information register 16 with the traffic information in the message constitutes *processing the message according to the comparison.*” Pet. 57–58 (citing Ex. 1003 ¶¶ 185–186).

In response to Petitioner’s assertions for limitations [1.2] and [1.3], Patent Owner contends that the combination of Shyu and Yoshida fails to disclose or suggest “comparing the message identifier to a vehicle identifier because ***Petitioner points to the same value for both identifiers.***” PO Resp. 27; Sur-Reply 23. However, Petitioner’s reliance on the same value for the “message identifier” and “vehicle identifier” is consistent with the ’351

patent's disclosure. The '351 patent identifies that a "message may include a Vehicle Identification Number (VIN number) that identifies specific vehicles associated with the message." Ex. 1001, 2:38–41; *see also id.* at 2:42–43 (describing that "any vehicle identifier or user identifier can be used" as a "message identifier.")). And, when performing a comparison, the '351 patent discloses that a processor simply "compares a stored vehicle identifier with the identifier contained in the received message." *Id.* at 2:43–45.

Patent Owner further argues that under "Petitioner's characterization of Shyu, the message identifier will *always* either match the vehicle identifier or be unable to be compared to the vehicle identifier because the vehicle identifier *will not exist*." PO Resp. 28. According to Patent Owner,

[i]f the result of the comparison is always the same, then there is no point to processing the message *according to the comparison*. The method would just process the message. There must be some meaningful result of the comparison in order for the recited "processing . . . according to the comparison" to have any meaning.

PO Resp. 29. However, the '351 patent's Specification informs us that the "comparing" step is simply based on whether or not a match has occurred. In this regard, while describing the "comparing" step, the '351 patent's Specification discloses that "[i]f the message identifier matches the vehicle identifier, the message is reported to a vehicle operator or a reply message is sent back in block 36." Ex. 1001, 2:46–48. And, "[i]f the message identifier does not match some stored identifier associated with the vehicle, the message is either discarded or stored in a message buffer in block 38." *Id.* at 2:53–56.

Consistent with this understanding, we agree with Petitioner that although claim 1 does not require a “meaningful result,” Shyu “provide[s] a meaningful result that allows for further processing to be conducted based on that result.” Pet. Reply 25 (citing Pet. 54–57; Ex. 1003 ¶¶ 176–182). Petitioner, relying on the testimony of Mr. Wilson explains, that “if there is a match, *Shyu*’s system processes the traffic information stored in the message such that it replaces the previously stored traffic information corresponding to that *vehicle identifier*. *Id.* (citing Pet. 54–57; Ex. 1003 ¶¶ 176–182; Ex. 1004, 4:41–43). And, if there is no match found, Petitioner, relying on the testimony of Mr. Wilson, explains that “*Shyu*’s system processes the traffic information stored in the message to add a new register field containing the information from the message. Thus, the message can be processed to either replace an existing register field or add a new register field.” *Id.* at 25–26 (citing Pet. 54–57; Ex. 1003 ¶¶ 176–182; Ex. 1004, 4:41–43).

Patent Owner asserts that Petitioner’s entire argument regarding how Shyu further processes information after the comparison is based on a single sentence in Shyu that states “[t]o avoid accumulating repeated information, the information is stored based on the codes of the vehicles and is continuously updated.” PO Resp. 30 (quoting Ex. 1004, 4:41–43). According to Patent Owner, “[e]verything else in Petitioner’s argument is based on their expert’s speculative extrapolation from this sentence.” *Id.* at 30–31 (citing Pet. 55–57; Ex. 1003 ¶¶ 176–182).

We find credible Petitioner’s argument and Mr. Wilson testimony that one of ordinary skill in the art “would have recognized that updating the traffic information stored in the passing-by-vehicle information register 16 with the traffic information in the message constitutes *processing the*

message according to the comparison.” Ex. 1003 ¶ 186. In particular, Mr. Wilson testifies that

[i]f the vehicle code exists, the system would *process[] the message* by updating the corresponding traffic information stored in the passing-by-vehicle information register 16 with the traffic information in the message, which a POSITA would have understood as including the manipulation of the message data so as to be stored in the register 16. *See, e.g.,* Microsoft Computer Dictionary (EX1013), p. 423 (“processing . . . The manipulation of data within a computer system.”).

Id. Mr. Wilson further testifies that “[i]f the comparison determines that the matching vehicle code does not exist, the system would *process the message* by inserting a new vehicle code and traffic information into the passing-by-vehicle information register 16.” *Id.*

We have considered Patent Owner’s arguments, but do not find them to be persuasive. Patent Owner’s assertion largely consists of attorney argument, unsupported by any testimony from Dr. Goldberg or other evidence to support its assertion that Shyu fails to disclose or suggest “processing the message according to the comparison,” as recited by limitation [1.3].

Patent Owner further contends that “[t]here is **nothing** in Shyu to teach or suggest parsing every incoming data structure to update individual fields of an already-stored data structure. The complicated process of doing so is purely a creation of Mr. Wilson.” *Id.* at 32; *see also id.* at 31 (“Shyu only discloses that ‘the information is stored’ in the same way it is received and or transmitted—as a whole data structure.”). However, we are not persuaded that Shyu is so limited. Patent Owner’s argument runs counter to the description in the reference itself, which discloses that Shyu’s “transference,” i.e., the traffic information from other vehicles, is received

and then first decoded. Ex. 1004, 4:28–30; Fig. 3. As Petitioner correctly notes,

the information stored in passing-by vehicle register 16 only includes the information from the passing-by vehicles, such as vehicle a₁, and not the vehicles in front of vehicle b, which is stored separately in front-vehicle register 15. EX1004, 4:28–43. Therefore, the transference received by vehicle b is already separated prior to being stored.

Pet. Reply 27.

In its Sur-Reply, Patent Owner argues that there would be no need to perform the “comparison” Petitioner proposes because it “does not really compare *anything*, but instead only uses the identified ‘message identifier’ to determine where to store the traffic information: in an existing data entry or a new data entry.” Sur-Reply 23. We disagree.

Patent Owner has not provided a clear and persuasive explanation as to why Shyu “does not really compare *anything*.” *Id.* Here, Shyu describes storing data based on codes in order to avoid storing duplicative data. *See* Ex. 1004, 4:41–43 (“To avoid accumulating repeated information, the information is stored based on the codes of the vehicles and is continuously updated.”). We credit Mr. Wilson’s testimony that one of ordinary skill in the art “would have recognized that to update traffic information that is stored based on vehicle codes, the system would compare the vehicle code associated with traffic information received from a vehicle in a message, with vehicle codes that are already stored in the passing-by vehicle information register 16.” Ex. 1003 ¶ 178. We also agree with Petitioner and Mr. Wilson that such a comparison “would prevent the passing-by vehicle from storing multiple instances of traffic information from the same vehicle

or “accumulating repeated information” as Shyu explains. *Id.* (citing Ex. 1004, 4:41–43).

Patent Owner last argues that even if Shyu discloses “the general functions of comparing and storing,” it “completely omits the ‘processing’ step required by the claim language.” Sur-Reply 24. However, the descriptions in Shyu along with the testimony provided by Mr. Wilson, already discussed above, disclose the separate functions of “comparing” and “processing,” as required by the language of claim 1. *See, e.g.*, Ex. 1003 ¶¶ 176–187.

For these reasons, we find that Shyu discloses “processing the message,” as required by limitation [1.3].

- e) [1.4] storing the message in memory located in the vehicle and periodically transmitting the stored message from the vehicle to other vehicles*

Petitioner asserts that “Shyu discloses that “each first **traffic information (of the vehicle itself that sends it out)** will be **stored in a passing-by-vehicle information register 16** and is provided to the encoder 17 and **the transmitter 7 to send out.**” Pet. 58–59 (citing Ex. 1004, 4:30–33; Ex. 1003 ¶¶ 189–190). Petitioner explains that “[a] POSITA would have recognized that the passing-by-vehicle information register 16 is a memory” (Pet. 59 (citing Ex. 1003 ¶ 189; Ex. 1013, 445; Ex. 1004, 4:57–58)), and as such, “*Shyu’s* description of storing the traffic information and sending it out *discloses storing the message in memory and transmitting the stored message from the vehicle.*” Pet. 59 (citing Ex. 1003 ¶ 189).

Petitioner further asserts that Yoshida similarly discloses storing “traffic data similar to that of *Shyu*” and then transmitting that data “**at predetermined time intervals** from the on-vehicle apparatus 3 on the

vehicle 2.” Pet. 61 (citing Ex. 1012, 17:58–66). According to Petitioner, “[a] POSITA would have been motivated to combine *Shyu*’s teachings of transmitting traffic information with *Yoshida*’s teachings of transmitting information periodically, such as at predetermined time intervals.” Pet. 61 (citing Ex. 1003 ¶ 194). Petitioner explains that “modify[ing] *Shyu*’s transmitter 7 to send information from the passing-by-vehicle information register 16 at predetermined time intervals” would have been no more than the combination of prior art elements according to known methods to yield predictable results. Pet. 61–62 (citing Ex. 1003 ¶ 194). Petitioner further explains that “a POSITA would have recognized the desirability of periodic transmission because it would have the effect of saving power resources.” Pet. 62 (citing Ex. 1003 ¶ 195; Ex. 1014 ¶¶ 34, 37 (Knaian roadway monitoring patent application)).

In response, Patent Owner argues that one of ordinary skill in the art would not have been motivated to combine *Shyu* and *Yoshida* because *Shyu* is directed to a mesh communication system and *Yoshida* is directed to a “star-based communication system.” PO Resp. 33. Patent Owner asserts that “*Yoshida* discloses repeating of information from a vehicle to the central computer to provide a time snapshot of the traffic and/or situation at the vehicle.” *Id.* (citing Ex. 2002 ¶ 89). Patent Owner further asserts that, in contrast, the ’351 patent “periodically transmit[s] the exact same stored messages on the vehicle as a means to guarantee the reliable reception of any given message at the receiving vehicle.” *Id.* at 34 (citing Ex. 2002 ¶ 90).

Petitioner replies that *Shyu* and *Yoshida* both “use known wireless transmission methods, such as radio waves to transmit information.” Pet. Reply 28 (citing Ex. 1004, 3:43–48; Ex. 1012, 12:33–46). According to Petitioner, a person of ordinary skill would have been motivated to make the

combination because “[t]he use of periodic transmissions over wireless networks allows for the well-known benefit of saving or reallocating power resources.” *Id.* (citing Ex. 1003 ¶ 195). Petitioner asserts that whether or not Yoshida “transmit[s] the exact same message each time” is irrelevant because “*Yoshida* is not relied on for its disclosure of the content of the message. Rather, *Yoshida* is relied on for teaching the use of periodic transmissions.” *Id.*

Upon review of the evidence in the current record and the parties’ contentions, we determine that Petitioner has shown sufficiently that a person of ordinary skill in the art would have had reason, with rational underpinnings, to combine Shyu and Yoshida in the manner Petitioner proposes. We credit Mr. Wilson’s testimony that it would have been obvious to “modify *Shyu*’s transmitter 7 to send information from the passing-by-vehicle information register 16 at predetermined time intervals.” Pet. 62 (citing Ex. 1003 ¶ 194). Mr. Wilson provides testimony that “[i]ncorporating the teachings of *Yoshida* into those of *Shyu* would have been no more than the combination of prior art elements according to known methods to yield predictable results.” Ex. 1003 ¶ 194. Petitioner, with support from Mr. Wilson, contends that one of ordinary skill in the art would have recognized multiple “advantages of transmitting the traffic information periodically as taught by *Yoshida*.” Pet. 62 (citing Ex. 1003 ¶ 195). For example, Mr. Wilson testifies that one of ordinary skill in the art “would have recognized the desirability of periodic transmission because it would have the effect of saving power resources” (Ex. 1003 ¶ 195), and submitted evidence supporting such testimony. *Id.* (citing Ex. 1014 ¶ 37 (“Periodic transmissions are well adapted to applications where relatively small

amounts of data are transferred and offer the advantages of both power conservation and efficient utilization of limited frequency bandwidth.”).

In its Sur-Reply, Patent Owner asserts that the proposed combination of Shyu and Yoshida is “unsuitable.” Sur-Reply 27. More particularly, Patent Owner argues that even though “it may be beneficial to use periodic transmissions i[n] some systems, Shyu is not such a system” and “[t]hat is why Shyu’s mesh-based network uses continuous transmission.” *Id.* at 26–27.

We do not find Patent Owner’s argument persuasive. The motivation analysis takes into consideration whether a modification renders the prior art unsatisfactory or inoperable for its intended purpose. *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984). However, merely showing that the result of the modification may be inconsistent with some of the reference’s goals is not sufficient for a modification to be unsatisfactory or inoperable for its intended purpose. *In re Gurley*, 27 F.3d 551, 554 (Fed. Cir. 1994).

Patent Owner asserts that one of ordinary skill in the art would not be motivated to modify Shyu to incorporate Yoshida’s periodic transmissions because the information in Shyu is distributed by passing information from vehicle to vehicle continuously. Sur-Reply 25–27. However, Shyu identifies that it is not always beneficial to receive traffic information, e.g., when “the traffic status is visible.” Ex. 1004, 2:48–57. Therefore, while Patent Owner may be correct that “[i]f vehicle a₁ does not actively transmit information at the time while passing vehicle b, vehicle b would not receive the most recent information about the route on which vehicle a₁ was traveling” (Sur-Reply 27), “a given course of action often has simultaneous advantages and disadvantages, and this does not necessarily

obviate motivation to combine.” *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006).

For the foregoing reasons, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 1 would have been obvious in view of Shyu and Yoshida.

f) Analysis of Claim 2

Dependent claim 2 recites “[a] method according to claim 1 including deleting the message from memory according to when the message was received in the vehicle.” Ex. 1001, 6:27–29.

Petitioner asserts that Shyu discloses storing “traffic information” from other vehicles. Pet. 64. Petitioner further asserts that Shyu discloses “that the **“storage in the register 16 is updated in a process of first-in & first-out and removing any information of the path already behind the receiving vehicle.”** *Id.* (citing Ex. 1004, 4:34–36). According to Petitioner, “[a] POSITA would have recognized that in a FIFO process, the traffic information that is received first (first-in), would be deleted first (first-out).” Pet. 64 (citing Ex. 1003 ¶ 200).

Patent Owner does not present any argument for claim 2 other than what we have already considered with respect to claim 1. After considering the evidence and arguments of record, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 2 would have been obvious in view of Shyu and Yoshida.

IV. CONCLUSION¹⁵

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not shown Unpatentable
4–7	103(a)	Shyu, Kiendl	4–7	
4, 6	102(e)	King		
4, 6	103(a)	King		
1, 2	103(a)	Shyu, Yoshida	1, 2	
Overall Outcome			1, 2, 4–7	

VI. ORDER

For the reasons given, it is:

ORDERED that Petitioner has established based on a preponderance of evidence that claims 1, 2, and 4–7 of U.S. Patent 6,792,351 B2 are *unpatentable* as set forth above; and

FURTHER ORDERED because this is a final written decision, the 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.

¹⁵ 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).

IPR2020-00354
Patent 6,792,351 B2

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