

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UNITED SERVICES AUTOMOBILE ASSOCIATION,
Petitioner,

v.

AUTO TELEMATICS LTD.,
Patent Owner.

IPR2023-00768
Patent 10,192,369 B2

Before GEORGE R. HOSKINS, FRANCES L. IPPOLITO, and
SEAN P. O'HANLON, *Administrative Patent Judges*.

IPPOLITO, *Administrative Patent Judge*.

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

I. INTRODUCTION

United Services Automobile Association (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of claims 1–27 of U.S. Patent No. 10,192,369 B2 (Ex. 1001, “the ’369 patent”). Auto Telematics Ltd. (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”).

Applying the standard set forth in 35 U.S.C. § 314(a), we instituted an *inter partes* review as to all claims and grounds set forth in the Petition. Paper 10 (“Inst. Dec.”).

After institution, Patent Owner filed a Patent Owner Response (Paper 15, “PO Resp.”), Petitioner filed a Reply (Paper 21) and a Corrected Reply (Paper 23, “Pet. Reply”)¹, and Patent Owner filed a Sur-reply (Paper 22, “PO Sur-reply”). An oral hearing was held for this proceeding on August 6, 2024, and the transcript is of record. Paper 27 (“Tr.”).

We have jurisdiction pursuant to 35 U.S.C. § 6. This Decision is a Final Written Decision under 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73 as to the patentability of the Challenged Claims. Petitioner bears the burden of proving unpatentability of the Challenged Claims. *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) (2021). Having reviewed the arguments and the supporting evidence, we determine that Petitioner has shown, by a preponderance of the evidence, that claims 1–27 of the ’369 patent are unpatentable.

¹ Citations herein refer to Paper 23.

A. Related Matters

According to the parties, the '369 patent is the subject of a civil action in *Auto Telematics Ltd. v. United Services Automobile Association*, 6:22-cv-00474-ADA-DTG, W.D. Tex.), filed May 11, 2022. Pet. 86; Paper 5. Four other *inter partes* reviews, IPR2023-00518, IPR2023-00857, IPR2023-00911, and IPR2024-00779 involve patents related to the '369 patent.

B. Real Parties in Interest

Petitioner identifies United Services Automobile Association as the real party-in-interest. Pet. 86.

Patent Owner identifies Auto Telematics Ltd. as the real party-in-interest. Paper 5, 1.

C. The '369 Patent (Ex. 1001)

The '369 patent relates generally to “a mobile device adapted for installation to a vehicle and configured to log . . . driving information, for example, video footage associated with how the vehicle is driven.” Ex. 1001, 1:24–27. This information may be utilized “to determine the cause of an event such as an accident, to modify driver behaviour and/or to determine insurance premiums.” *Id.* at 1:27–30.

The '369 patent describes that “data logging devices exist for road vehicles,” and can be used “to determine the cause of traffic accidents or other vehicle-related events, whether these stem from a vehicle malfunction or driver negligence.” *Id.* at 1:41–46. However, these devices are often “integrated with the car data network,” and “difficult and costly to install.” *Id.* at 1:49–53.

The '369 patent thus proposes a “mobile telecommunications device adapted for installation to a vehicle and configured to log driving information associated with the vehicle when driven.” *Id.* at 1:64–67. According to the '369 patent, “the use of a mobile telecommunication device enables a data logging device to be conveniently and inexpensively retrofitted to a vehicle.” *Id.* at 2:15–17.

To log the data, the adapted device operates by “registering the start of the driving period during which the mobile device is installed to the vehicle and the vehicle is being driven by the driver.” *Id.* at 3:21–23. This prevents logging information needlessly. *Id.* at 3:24–25. Preferably, the registration is “in response to an initialisation input,” such as user input, or automatic, “in response to the mobile device being installed to the vehicle and/or the vehicle being driven.” *Id.* at 3:32–39. “For example, if the sensor data reflects a detected speed above a predetermined threshold—for example, 20 kilometers per hour—then this can be used to trigger the start of the driving period.” *Id.* at 3:42–45.

Figure 2, reproduced below, shows a schematic presentation of an automobile with a mobile device installed for logging. *Id.* at 12:57–59.

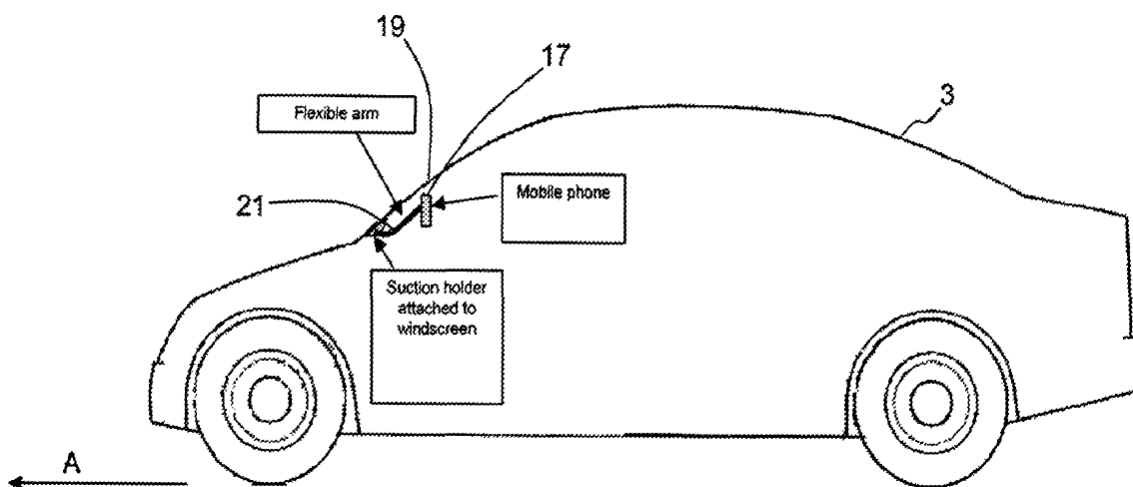


Figure 2, reproduced above, shows a preferred arrangement of the mobile telecommunications device 17 within the automobile 3. *Id.* at 15:1–4.

Figure 3, reproduced below, shows a schematic illustration of the functional components of the mobile device of Figure 2. Ex. 1001, 12:60–61.

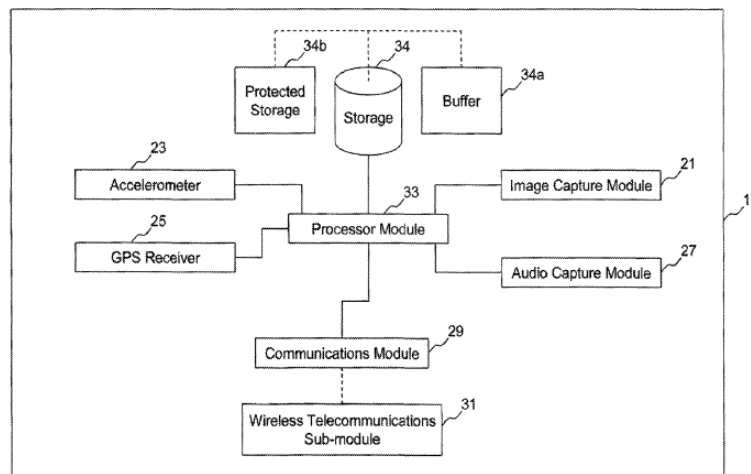


Fig. 3

Figure 3, reproduced above, shows modular components of mobile telecommunications device 17 of Figure 2. Ex. 1001, 15:41–42. The '369 patent discloses that sampled sensor data is stored in storage 34. *Id.* at 16:66–67. Referring to the flow chart in Figure 4a, the '369 patent further discloses that

[o]nce the driving period has been initiated, sensor data is sampled and recorded in storage 34, at step 44. Additionally, the sampled sensor data is used to generate driving information by the processor module 33. The sampled sensor data and the driving information is continuously analysed by the processor module 33, at step 46.

The processor module 33 determines if a driving incident has been detected, at step 48. This is determined on the basis of the analysis carried out at step 46. If a driving incident has been detected, all the sensor data and driving information associated

with the data file period, is stored in a data file in protected storage 34b, at step 50.

Ex. 1001, 19:17–28. According to the '369 patent, the sampled data is preferably stored in the storage buffer 34a, “unless a driving incident has been identified, in which case the associated sensor data and driving information is stored in the *permanent storage component 34b to avoid undesirable overwriting.*” *Id.* at 17:8–14 (emphases added). The '369 patent adds that

[i]n preferred embodiments, the FIFO storage buffer 34a is provided with a finite amount of storage space. Nonetheless, said storage space may be predefined by the user as will be described below. In any case, once this storage space has been exhausted, the oldest recorded data is overwritten by newly sampled data, and this cycle of overwriting older data with newly sampled data is continuously carried out during operation of the telecommunications device 17, *unless a driving incident has been detected, in which case, and as mentioned previously, all data related to the driving incident is stored in a long term protected storage 34b to safeguard it from being overwritten by newer data.*

Ex. 1001, 17:15–26 (emphases added).

D. Challenged Claims

Petitioner challenges claims 1–27. Pet. 1. Claims 1, 26, and 27 are the independent claims. Claim 1 is reproduced below with, in brackets, the Petition’s identifiers (Pet. xi–xii):

[1.1] A mobile telecommunications device configured to log driving information associated with a vehicle, the mobile telecommunications device comprising:

[1.2] a sensor set comprising an image sensor, an audio sensor, an accelerometer or a positioning module, or a combination thereof;

[1.3] a user interface;

[1.4] a processor and;

[1.5] a memory;

[1.6/1.7/1.8] the mobile telecommunications device being configured to:

[1.6] determine, based on at least one of the inputs received by the user interface and sensor data from the device's sensor set, a start of a driving period during which the mobile device is removably attached to the vehicle and the vehicle is in use;

[1.7] process the sensor data from the sensor set during the driving period to derive driving information associated with how the vehicle is driven; and

[1.8] store a selection of the driving information to the memory;

[1.9/1.10/1.11] wherein

[1.9] the driving information is derived without data from the vehicle sensors, and

[1.10] the memory comprises: a long term memory for persistently storing driving information and a short term memory for transiently storing driving information,

[1.11] wherein the short term memory receives driving information at a higher update rate than the long term memory,

[1.12/1.13] the mobile telecommunications device being further configured to:

[1.12] write driving information to the short term memory at a predetermined update rate during the driving period in a predetermined sequence; and,

[1.13] overwrite the driving information previously written to the short term memory in accordance with the predetermined sequence.

Ex. 1001, 31:42–32:10 (minor reformatting added).

E. Alleged Grounds of Unpatentability²

Petitioner asserts the following grounds of unpatentability:

Claims Challenged	35 U.S.C. §	References
1–4, 6, 9–12, 16–24, 26	103(a)	Curry ³ , Rabu, ⁴ Katayama ⁵
5	103(a)	Curry, Rabu, Katayama, Tamir ⁶
7, 8, 15	103(a)	Curry, Rabu, Katayama, Balachandran ⁷
13, 14	103(a)	Curry, Rabu, Katayama, Thompson2010 ⁸
25	103(a)	Curry, Rabu, Katayama, Willis ⁹

² We apply the pre-AIA version of 35 U.S.C. § 103 because the claims at issue appear to have an effective filing date prior to March 16, 2013, the effective date of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”). *See* Ex. 1001, 1:7–19.

³ WIPO Application Publication No. WO 2010/042545 A2, published April 15, 2010 (Ex. 1005) (“Curry”).

⁴ U.S. Patent No. 8,682,399 B2, issued March 25, 2014 (Ex. 1013) (“Rabu”).

⁵ European Patent Application Publication No. EP 1,914,691 A1, published April 23, 2008 (Ex. 1024) (“Katayama”).

⁶ U.S. Patent No. 7,821,421 B2, issued October 26, 2010 (Ex. 1006) (“Tamir”).

⁷ U.S. Patent No. 6,073,004, issued June 6, 2000 (Ex. 1007) (“Balachandran”).

⁸ Thompson et. al, “Using Smartphones to Detect Car Accidents and Provide Situational Awareness to Emergency Responders,” Mobileware 2010, LNICST 48, pp. 29–42, 2010 (Ex. 1008) (“Thompson2010”).

⁹ WIPO Application Publication No. WO 2007/114716 A1, published October 11, 2007 (Ex. 1009) (“Willis”).

27	103(a)	Curry, Rabu, Katayama, Berkobin ¹⁰
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Pet. 1–2. In addition to the references listed above, Petitioner relies on the Declaration of Dr. William R. Michalson (Ex. 1003). *See, e.g.*, Pet. 1 n.1. Patent Owner relies on the Declaration of Mr. Christopher K. Wilson (Ex. 2001).

II. ANALYSIS

A. *Level of Ordinary Skill in the Art*

In determining the level of skill in the art, we consider the type of problems encountered in the art, the prior art solutions to those problems, the rapidity with which innovations are made, the sophistication of the technology, and the educational level of active workers in the field. *Custom Accessories, Inc. v. Jeffrey-Allan Indus. Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986); *Orthopedic Equip. Co. v. U.S.*, 702 F.2d 1005, 1011 (Fed. Cir. 1983).

Petitioner does not expressly propose a level of skill of the ordinary artisan in the Petition. *See generally* Pet. Instead, Petitioner refers to the Michalson Declaration for a definition. *Id.* at 11 n.3 (“USAA-1003, ¶¶14-15 (defining a POSITA)”). In the cited paragraphs of the Declaration, Petitioner’s expert proposes “that a person of ordinary skill in the art in this matter would have had at least a Bachelor of Science Degree (or equivalent) in an academic area emphasizing electrical engineering, computer

¹⁰ U.S. Patent Application Publication No. 2008/0255888 A1, published October 16, 2008 (Ex. 1010) (“Berkobin”).

engineering, computer science, or a related technical field, and about 2–3 years of experience in the field of telematics systems (e.g., familiarity with control and diagnostic systems, navigation systems and wireless communication technology).” Ex. 1003 ¶ 15. Dr. Michalson further proposes “[m]ore education, i.e., a doctorate in an academic area emphasizing electrical engineering, computer engineering, computer science, or a related technical field, would compensate for fewer years of work experience.” *Id.*

In its Response, Patent Owner acknowledges that it “does not dispute that a person of ordinary skill in the art (‘POSITA’) would include those falling within Petitioner’s proposed definition” but adds that a POSITA would include “individuals with a Bachelor of Science degree in other fields, including physics, and that the particular educational experience becomes less relevant as the individual’s experience in the telematics field increases.” PO Resp. 3–4 (citing Ex. 2001 ¶¶ 10–11).

We observe that the level of ordinary skill in the art is not in dispute, nor is it dispositive of issues in this final written decision. Nevertheless, we adopt the proposal of Petitioner’s expert, which comports with the teachings of the ’369 patent and the asserted prior art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). We note that we would reach the same conclusions under Patent Owner’s proposed addition to Petitioner’s definition.

B. Claim Construction

We construe each claim “in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” 37 C.F.R.

§ 42.100(b). Under this standard, claim terms are generally given their plain and ordinary meaning as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc).

1. “*driving period*” claims 1–27

a. *Petitioner’s Contentions*

In the Petition, Petitioner asserts that “no express constructions are required in this proceeding.” Pet. 3. However, Petitioner contends, as to the term “driving period,” that “the claim leaves open the possibility of the driving period corresponding to the beginning, middle or end of, a vehicle’s operation.” *Id.* Petitioner thus contends that “this claim term establishes just two ‘driving period’ attributes: (1) ‘the mobile device is removably attached to the vehicle’ and (2) ‘the vehicle is in use.’” *Id.* at 3–4 (citing Ex. 1003 ¶ 138). “These attributes may be satisfied by a start of a monitoring period, whether at the onset of vehicle driving or whether instead before or thereafter.” *Id.* at 4.

b. *Patent Owner’s Contentions*

Patent Owner contends that Petitioner proposed the same construction in the parallel district court proceeding for the ’369 patent, but that the district court agreed with Patent Owner that no construction was required and the plain and ordinary meaning applied. PO Resp. 4 n.1. Patent Owner adds that Petitioner’s proposal introduces “unsupported limitations for the driving period” because “Petitioner’s characterization of the start of a driving period as a ‘monitoring period’ that starts at any time with respect to the onset of driving . . . is simply an inaccurate categorization of ‘driving

period’ that has no basis in the specification or claims.” *Id.* at 5. Patent Owner contends that the “claim language itself accurately captures the scope of the invention, and there is no need for a different construction incorporating Petitioner’s manufactured limitations for the driving period.” *Id.*

More specifically, Patent Owner contends that

[o]nce the start of the driving period is determined, the mobile device processes sensor data from its sensor set, *from the start of the period in which the vehicle is being driven and during that entire driving period*, to derive driving information associated with how the vehicle is driven and to store this derived driving information.

PO Resp. 8 (emphasis added) (citing Ex. 1001, 19:17–22; 20:23–29; Ex. 2001 ¶¶ 46–48). With respect to the “entire driving period,” Patent Owner adds in its Sur-reply that “[a] driving period is the entire period in which the vehicle is being driven by a driver” rather than a period after the vehicle is in operation. PO Sur-reply 4.

c. *Analysis*

We note that claim 1 requires that

[1.6] the mobile telecommunications device being configured to: determine, based on at least one of the inputs received by the user interface and sensor data from the device’s sensor set, *a start of a driving period during which the mobile device is removably attached to the vehicle and the vehicle is in use[.]*

Ex. 1001, 31:53–57 (claim 1, emphasis added)). Independent claim 26 similarly recites:

the mobile telecommunications device being configured to: determine, based on at least one of the inputs received by the user interface and sensor data from the device’s sensor set, *a start of a driving period during which the mobile device is removably affixed to the vehicle and the vehicle is in use[.]*

Ex. 1001, 34:3–9 (emphasis added). And, independent claim 27 also recites:

the mobile telecommunications device being configured to:
determine, based on at least one of the inputs received by the user
interface and sensor data from the device’s sensor set, *a start of
a driving period during which the mobile device is removably
affixed to the vehicle and the vehicle is in use[.]*

Id. at 34:40–46 (emphasis added).

Below, we discuss limitation [1.6] as illustrative. Our discussion applies to the similar or identical claim language recited in independent claims 26 and 27, and required by the dependent claims.

The express language of independent claim 1 does not require that the “driving period” lasts the entire period (beginning, middle, and end) of vehicle operation as Patent Owner proposes. Rather, the “start of a driving period” is *during* the period in which the mobile device is removably attached to the vehicle and the *vehicle is in use*. As such, the start of the “driving period” occurs during the time the vehicle is in use, but the claim language does not otherwise go further to expressly dictate that the driving period encompasses the entire time a vehicle is in use.

This reading of “driving period” is consistent and supported by the Specification. Figure 4a from the ’369 patent is provided below:

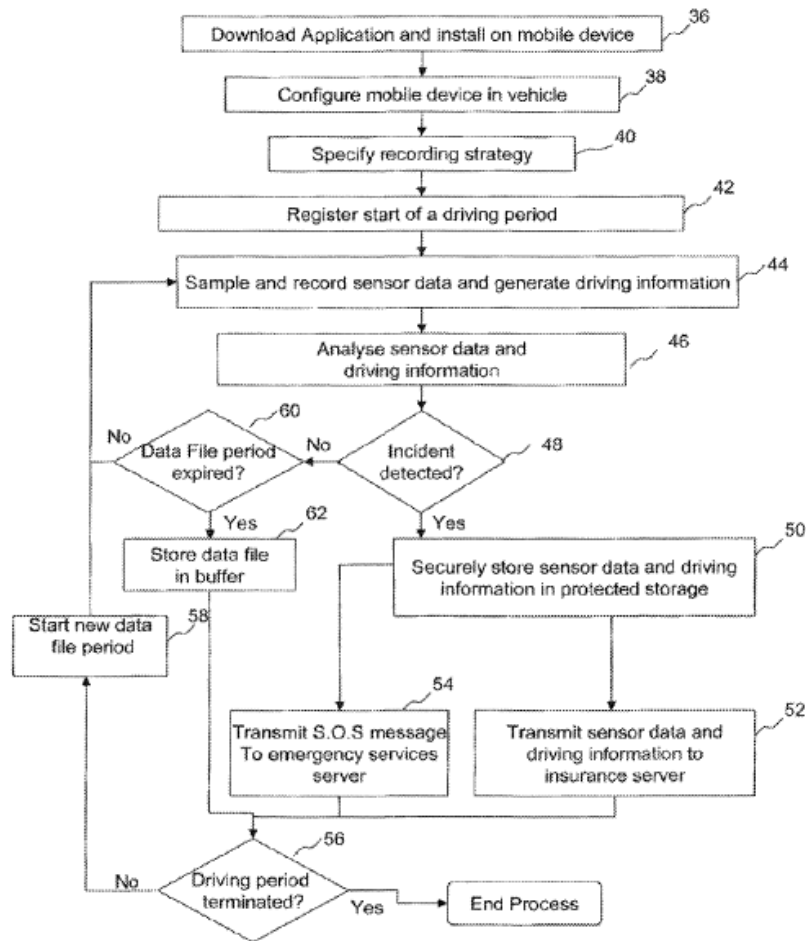


Fig. 4a

Figure 4a is a process flow chart, illustrating method steps executable by the mobile device described by the '369 patent. Ex. 1001, 12:62–63. As shown in Figure 4a, the start of a driving period is registered at step 42. *Id.* at 18:63–65. The '369 patent teaches that there are several ways to register the start of a driving period. For example, “[t]he start of a driving period *may be manually entered* by the user via the application’s graphical user interface (GUI).” *Id.* at 18:65–67 (emphasis added). Or, “the start of the driving period may be automated . . . [and] the mobile device 17 may be configured to initiate the driving period once sensor data above a minimum threshold

value is recorded, indicative of the vehicle being in motion.” *Id.* at 18:67–19:4. The Specification further provides an example of the start of a driving period that initiates “once a velocity greater than 20 kilometers per hour is detected.” *Id.* at 19:5–6. In this regard, we understand the ’369 patent to disclose the start a “driving period” after a threshold velocity is reached, even though the vehicle is in operation and in use prior to reaching that velocity.

The testimony of Patent Owner’s expert, Mr. Wilson, is consistent with our understanding of the claim terms light of the claim language and Specification. For example, an exchange between Mr. Wilson and Petitioner’s counsel is provided below:

Q: So what I’m trying to understand is Let’s put it this way: You have – you start driving at Time A. You get up to speed at Time B, and you drive at Time C. Is the driving period A to C, and then the system then excludes A through B? Or is the driving period B to C?

A: The driving period of Wright^[11] would be B to C.

Q: Okay. And there’s no discussion in your – sorry, there’s no discussion in the asserted patents of how to exclude backing out of a driveway. Correct?

A: Again, the I don’t recall any discussion of backing out of a driveway in the patents.

Q: And just going back to that A to B to C hypothetical – so it’s B to C, because of the threshold that’s set. Right?

¹¹ Andrew William Wright is the sole named inventor of the ’369 patent. *See* Ex. 1001, code (72).

A: B is the trigger – or the threshold is the trigger that starts the driving period or an example of a trigger that starts the driving period, according to Wright.

Ex. 1085, 32:3–33:1. As shown above, Mr. Wilson’s testimony also supports the notion that a POSITA would understand the recited “driving period” may start after the vehicle is in operation, rather than the entire driving time.

In the Sur-reply, Patent Owner argues that the Specification discloses processing for the *entire* driving period. PO Sur-reply 8–9 (citing Ex. 1001, 3:19–45; 18:63–19:16). Yet, we do not agree that these citations support Patent Owner’s narrower construction. For example, in column 3, the ’369 patent describes that

it is preferred . . . when the application is executed, it controls the mobile device to register the start of a driving period in response to an initialisation input. The initialisation input may comprise a user input—for example, the user manually executing the application on the mobile device. The initialisation input may also or instead be generated automatically in response to the mobile device being installed to the vehicle and/or the vehicle being driven. *The initialisation input may be generated automatically in response to the sensor data having predetermined values. For example, if the sensor data reflects a detected speed above a predetermined threshold—for example, 20 kilometres per hour—then this can be used to trigger the start of the driving period.*

Ex. 1001, 3:32–45 (emphases added). In column 18, the ’369 patent discloses that

[t]he start of a driving period may be manually entered by the user via the application's graphical user interface (GUI). Alternatively, the start of the driving period may be automated. For example, *the mobile device 17 may be configured to initiate the driving period once sensor data above a minimum threshold*

value is recorded, indicative of the vehicle being in motion. For example, once a velocity greater than 20 kilometres per hour is detected.

Id. at 18:65–19:6 (emphases added). Consistent with our construction, the ’369 patent indicates that the vehicle may be driven before the sensor data reaches predetermined values to register the start of a driving period.

Moreover, these cited passages of the Specification support the disclosure provided in Figure 4a and the accompanying description that the start of a driving period for mobile telecommunications device 17 may occur after the vehicle is already in use or operation. *Id.* at 18:40–19:43.

With this understanding, we discern that the Specification and Mr. Wilson’s testimony directly contradict Patent Owner’s proposed construction. Accordingly, we decline to adopt Patent Owner’s asserted construction. The Specification’s description does not narrow the claim language, discussed above, to an *entire* driving period. Moreover, we have not incorporated Petitioner’s parallel district court claim constructions here. Instead, we have addressed Patent Owner’s proposed construction that requires a narrower construction of “driving period” than what is expressly recited in the claim and supported by both intrinsic and extrinsic evidence in the record.

2. “*driving information*” claims 1–27

Independent claims 1, 26, and 27 each recites “derive driving information associated with how the vehicle is driven.” Ex. 1001, 31:59–60, 34:12–13, 34:48–49.

Patent Owner asserts that “[d]riving information” as required by the claims, is “*associated with how the vehicle is driven.*” USAA-1001, Abstract. This driving information may include detected driving events,

including driving anomalies. PO Resp. 29. In the Reply, Petitioner does not dispute Patent Owner’s proposal. Pet. Reply 4 (“[Patent Owner’s construction] is consistent with the Petition’s identification of ‘driving behavior’ information in Curry, such as ‘talking...or texting...while driving’ and ‘speeding, abnormal acceleration, abnormal deceleration, and taking sharp turns.’”) (emphases omitted) (citing Pet. 35; Ex. 1003 ¶¶ 146–148; Ex. 1005, 3:24–4:6).

Nevertheless, based on the foregoing lack of dispute, we need not construe this term expressly to reach our decision. *See Realtime Data LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).¹²

3. *Remaining terms*

We do not need to construe any other terms expressly to reach our decision. *Id.*

C. *Principles of Law*

In *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966), the Supreme Court set out a framework for assessing obviousness under § 103 that requires consideration of four factors: (1) the “level of ordinary skill in the pertinent art,” (2) the “scope and content of the prior art,” (3) the “differences between the prior art and the claims at issue,” and

¹² We note, however, that even if we apply Patent Owner’s proposed construction, Petitioner has sufficiently shown by a preponderance of the evidence that the challenged claims are unpatentable as discussed in detail in this Decision.

(4) “secondary considerations” of non-obviousness such as “commercial success, long-felt but unsolved needs, failure of others, etc.” *Id.* at 17–18. “While the sequence of these questions might be reordered in any particular case,” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 407 (2007), the Federal Circuit has “repeatedly emphasized that an obviousness inquiry requires examination of all four *Graham* factors and that an obviousness determination can be made only after consideration of each factor.” *Nike, Inc. v. Adidas AG*, 812 F.3d 1326, 1335 (Fed. Cir. 2016).

We note that, with respect to the fourth *Graham* factor, the record in this proceeding does not include any argument or evidence directed to secondary considerations of nonobviousness. The analysis below addresses the first three *Graham* factors.

D. Prior Art References

1. Curry (Ex. 1005)

Curry describes “monitoring and controlling the use of a mobile computing device.” Ex. 1005, code (57). Curry’s system “includes a data server containing a model of a road network specifying traffic routes at a selected location,” and a “mobile wireless computing device . . . configured to wirelessly communicate with the data server.” *Id.* at 3:3–5¹³. Curry’s system further stores information from GPS and accelerometer sensors in the mobile device, such as location, speed, and acceleration, and uses the information to calculate a driver safety statistic, based on when and where

¹³ Exhibit 1005 contains two sets of page numbers on the bottom of each page. The citations in this Decision refer to the bottommost numbers unless the Decision quotes or refers to the exact citations in the parties’ briefs or expert declaration.

the wireless computing device was used and the motion of the device. *Id.* at 3:6–30.

Figure 1, reproduced below, illustrates Curry's system.

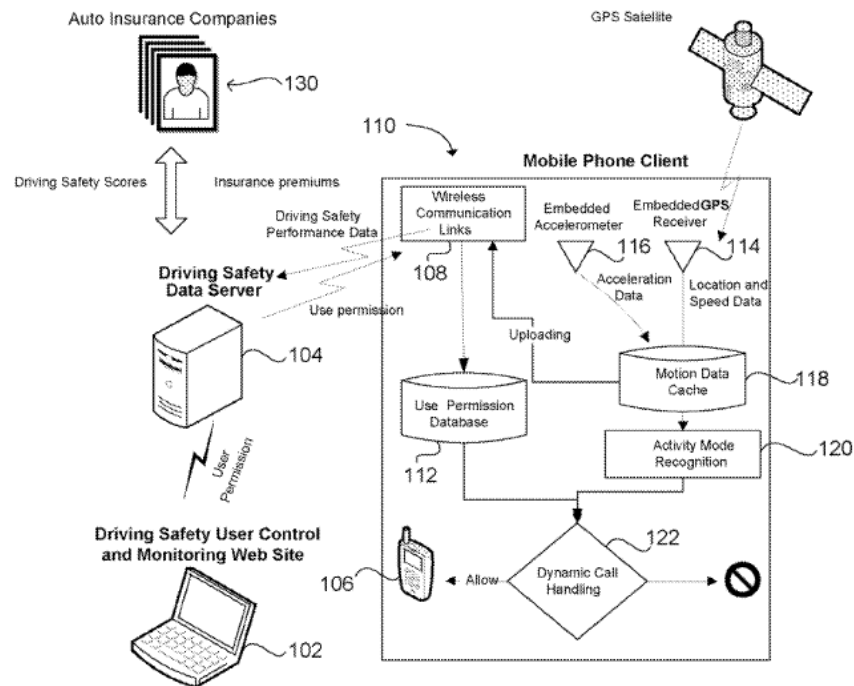


Figure 1 shows data server 104, user control web site 102, and mobile client 110 unit on a GPS-enabled mobile phone 106, with GPS 114, accelerometer 116 sensors, and wireless connection 108. *Id.* at 7:30–8:23.

2. *Rabu (Ex. 1013)*

Rabu is directed to “[m]ethods for operating a portable media device” (“PMD”) where “the portable media player can determine a motion status and select a mode of operation based on the motion status.” Ex. 1013, code (57). Figure 6, reproduced below, shows a flow diagram of Rabu’s method. *Id.* at 2:33–35.

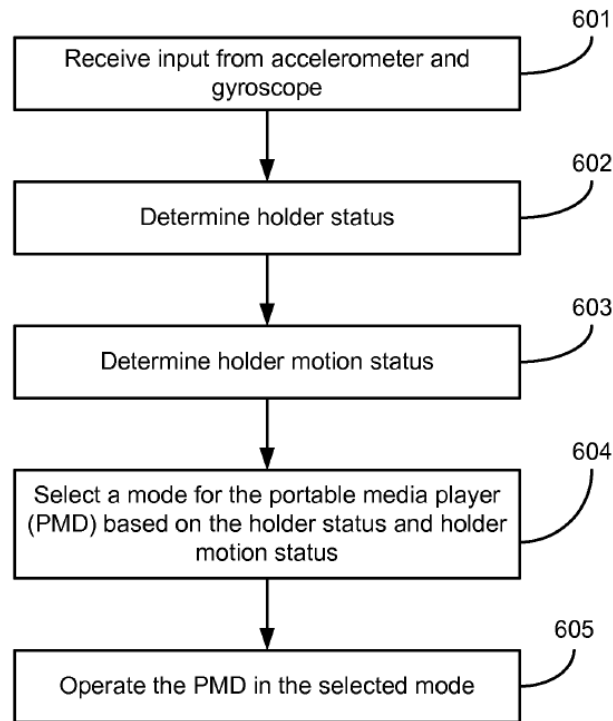


Figure 6, reproduced above, shows the main steps of the invention's operation. *Id.* As shown above, at block 601, the PMD can receive input from one or more motion sensors, e.g., an accelerometer and a gyroscope. Ex. 1013, 7:11–13. “[T]he input can indicate orientation angle and motion information of the PMD.” *Id.* at 7:14–15. At block 602, the PMD can determine a holder status and at block 603, the PMD can determine whether it is in a moving vehicle, in a stationary vehicle, being handled by a moving person, or being handled by a stationary person. *Id.* at 7:15–16, 7:22–26.

3. *Katayama* (Ex. 1024)

Katayama describes a driving monitor that records driver behavior and “a surrounding situation” during a period before and after an accident. Ex. 1024 ¶ 1. Figure 5 of Katayama, reproduced below, is a functional block diagram of the invention.

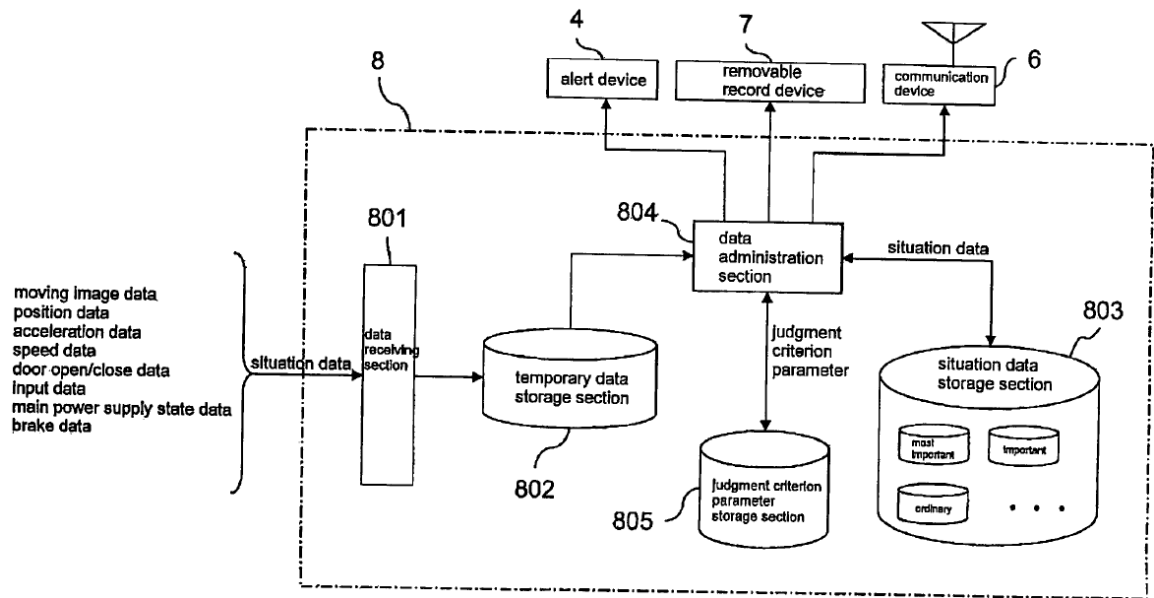


Figure 5 shows information processing device 8, which includes data receiving section 801, temporary data storage section 802, situation data recording section 803, and data administration section 804. *Id.* ¶¶ 31, 44.

Katayama discloses that “data administration section 804 determines whether or not the content of the situation data stored in the temporary data storage section 802 meets the predetermined condition,” and if so, the situation data is “transferred from the temporary data storage section 802 to the situation data recording section 803.” *Id.* ¶ 46.

4. *Tamir (Ex. 1006)*

Tamir discloses the collection of driving information from a plurality of vehicles and the evaluation of “driving behavior of a first vehicle based on information from at least one other vehicle or to a statistical analysis of multiple other vehicles.” *Ex. 1006*, 2:19–23. Tamir describes that in some embodiments, “samples are collected at a dynamically adjusted rate,” and the “rate of sampling is optionally determined according to the location of the driving, for example accumulating more samples at areas where there

[are] many accidents or near intersections.” *Id.* at 9:10–20. Tamir further describes that “when it is determined that the driver is driving relatively daringly, a higher sampling rate is used.” *Id.* at 20:62–21:1.

5. *Balachandran (Ex. 1007)*

Balachandran describes “enabling emergency call initiations in response to the detection of a vehicle accident.” Ex. 1007, code (57). More specifically, Balachandran relates to “the use of a cellular telephone for automatically initiating an outgoing call in response to a vehicle accident.” *Id.* at 1:6–9. Balachandran describes the importance of “automatically initiating an emergency call through a cellular telephone system in response to a vehicle accident without the need for subscriber initiation.” *Id.* at 1:27–29. Balachandran’s system “includes a plurality of sensors 10 strategically located about a vehicle to detect an accident involving the vehicle.” *Id.* at 2:19–21. In the event of an accident that warrants an emergency call, “the processor activates a timer 35 located within the cellular telephone 15,” and the “timer 35 provides a preselected time delay before initiating an outgoing emergency call in response to detection of a vehicle accident.” *Id.* at 2:50–56. An “audio or visual indication notifies the passengers of activation of the timer 35 and ceases with expiration or cutoff of the timer,” to provide “the passengers in the vehicle a period of time to gather their wits after an accident.” *Id.* at 2:56–60. “After the time delay period expires the processor 30 initiates emergency call setup.” *Id.* at 2:64–66.

6. *Thompson2010 (Ex. 1008)*

Thompson2010 is a university publication (“Institute for Software Integrated Systems, Vanderbilt University”) titled “Using Smartphones to

Detect Car Accidents and Provide Situational Awareness to Emergency Responders.” Ex. 1008, 1. Thompson2010 relates to “contributions to the study of using smartphone-based accident detection systems” and provides: “solutions to key issues associated with detecting traffic accidents, such as preventing false positives by utilizing mobile context information and polling onboard sensors to detect large accelerations[;]” and “architecture of [a] prototype smartphone-based accident detection system[,] . . . its ability to resist false positives[, and] . . . its capabilities for accident reconstruction.” *Id.* at 1.

In its introductory discussion, Thompson2010 states that “[b]uilding a smartphone-based wireless mobile sensor network for accident detection system is hard . . . because phones can be dropped (and generate false positives) and the phone is not directly connected to the vehicle.” *Id.* at 2. Thompson2010 further states: “In contrast, conventional in-vehicle accident detection systems rarely incur false positives because they rely on sensors, such as accelerometers and airbag sensors, that directly detect damage to the vehicle.” *Id.*

Thompson2010’s solution is as follows:

Solution approach → Use onboard sensors and physical context information to detect car accidents. This paper shows how smartphones in a wireless mobile sensor network can capture the streams of data provided by their accelerometers, compasses, and GPS sensors to provide a portable “black box” that detects traffic accidents and records data related to accident events, such as the G-forces (accelerations) experienced by the driver.

Id. The solution includes the following “client/server” architecture and “WreckWatch” application:

We also present an architecture for detecting car accidents based on WreckWatch, which is a mobile client/server application we developed to automatically detect car accidents. . . . [S]ensors built into a smartphone detect a major acceleration event indicative of an accident and utilize the built-in 3G data connection to transmit that information to a central server. That server then processes the information and notifies the authorities as well as any emergency contacts.

Id. To address false positives, WreckWatch employs sensor-based and context filters that (1) enable WreckWatch only when it is plugged into the vehicle; (2) use a speed filter to determine whether users are in vehicles; (3) record acceleration after threshold acceleration is reached and measured; and (4) ignore any acceleration events below 4Gs. *Id.* at 8.

7. *Willis (Ex. 1009)*

Willis generally relates to “a method of determining the proximity of a first radio frequency device to a second radio frequency device” and “a method for the control of a switch based on the proximity to each other of a first radio frequency device and a second radio frequency device.” Ex. 1009, 2:5–9. As an example, Willis discloses an embodiment that provides “proximity detection of the phone coming within 2 meters of the vehicle in any manner and from any direction.” *Id.* at 15:28–29.

8. *Berkobin (Ex. 1010)*

Berkobin’s disclosure relates to “determining driver behavior [by] receiving vehicle performance data, determining a driver safety metric based on the vehicle performance data, and transmitting the safety metric to a remote host.” Ex. 1010 ¶ 2. “[A]n embedded GPS and cellular transceiver . . . support real-time, remote driver and vehicle performance metrics.” *Id.* ¶ 21.

As an example, Berkobin's apparatus 101 includes vehicle mounted transceivers, e.g., for a PCS/Cell Modem 102. *Id.* ¶ 25. "Apparatus 101 can interface and monitor various vehicle systems and sensors to determine vehicle conditions." *Id.* ¶ 38. "[S]ubsystems can include a BlueTooth transceiver 115 . . . to interface with devices such as phones" and "user inputs[] such as emergency button 117 . . . caus[ing a] processor 106 to initiate a voice and data connection from the vehicle to a central monitoring station . . . referred to as a remote call center." *Id.* ¶ 44. "Data such as GPS location and occupant personal information can be transmitted to the call center." *Id.* Further, apparatus 101 "can transmit vehicle performance data upon a triggering event such as, but not limited to vehicle crash indication, acceleration above a threshold, speed above a threshold, and the like." *Id.* ¶ 54.

Additionally, Berkobin's central monitoring station 302 may comprise "one or more central monitoring station servers . . . as the 'back-bone' (i.e., system processing) of the present driver behavior determination system 300." *Id.* ¶ 51. The central monitoring station server may include software for data interpretations, statistics processing, data preparation and compression for output to apparatus 101, behavior determination, and driving report generation for output to users 303. *Id.*

F. Ground 1A - Obviousness Based on Curry, Rabu, and Katayama

Petitioner asserts that each of claims 1–4, 6, 9–12, 16–24, and 26 of the '369 patent would have been obvious over Curry, Rabu, and Katayama. Pet. 6–67.

1. Independent Claim 1

- a. mobile telecommunication device [1.1], sensor set [1.2], user interface [1.3], processor [1.4], process the sensor data from the sensor set during the driving period to derive driving information associated with how the vehicle is driven [1.7]*

Independent claim 1 is generally directed to a mobile telecommunications device configured to log driving information associated with a vehicle, the mobile telecommunications device [1.1] including “a sensor set” [1.2], “a user interface” [1.3], and “a processor” [1.4].” Ex. 1001, 31:42–49. The sensor set comprises “an image sensor, an audio sensor, an accelerometer or a positioning module, or a combination thereof.” *Id.* at 31:45–47. In limitation [1.7], claim 1 further requires that the mobile telecommunications device is configured to “process the sensor data from the sensor set during the driving period to derive driving information associated with how the vehicle is driven.” *Id.* at 31:58–60.

i. Petitioner’s Contentions

For these limitations, Petitioner refers to Curry’s Figure 1 that depicts Mobile Phone Client unit 110 on GPS-enabled mobile phone 106. Pet. 27–28. Petitioner asserts that Curry’s client 110 includes accelerometer 116 and GPS receiver 114 that are sensors. *Id.* at 28–29 (citing Ex. 1005, 2:23–27, 3:2–15, 7:24–8:2, 8:30–9:3, 10:16–26, 11:15–25, Fig. 1; Ex. 1003 ¶¶ 124–125). Petitioner further contends that Curry describes using the embedded accelerometer and positioning sensors to “detect and prevent unsafe driving behavior[s]”, and generate related “driving safety...score[s]” for determining insurance premiums. *Id.* at 6 (Ex. 1005, Abstract, 2:1–27, 3:24–4:6, 4:7–11, 7:5–22, 9:31–33, Fig. 1; Ex. 1003 ¶ 62).

Petitioner further contends that Curry’s activity mode recognition module 306 uses recorded time stamped data to estimate the type of activity (e.g., driving, walking, running or remaining substantially still) in real-time to allow users to receive or make a call, text, or use software programs. Pet. 35–36 (citing Ex. 1005, 13:20–14:26, Fig. 3; Ex. 1003 ¶ 149). Petitioner adds that a POSITA would have found it obvious to process “sensor data during the driving period to derive ‘possible violations of mobile phone use or unsafe driving behavior.’” *Id.* at 37 (citing Ex. 1005, 7:5–22, 8:29–10:12, 11:3–14, 13:20–16:6, Figs. 1, 3; Ex. 1015, 233–250¹⁴; Ex. 1003 ¶¶ 150–152).

Additionally, Petitioner contends that Curry’s client unit 110 features a graphical user interface used to display data and to enable user interactions. *Id.* at 29. According to Petitioner, “Curry describes various examples of UI-enabled user interactions including receiving a phone call while driving, and manually switching activity modes.” *Id.* Petitioner further contends that Curry teaches a user can download software to the mobile phone to set up client unit 110 and that client unit 110 can record location, speed, and acceleration data from sensors to local motion data cache 118 for further processing. *Id.* at 30 (citing Ex. 1005, 3:24–26, 8:20–27). Petitioner contends that a POSITA would have understood this disclosure to teach or suggest the existence of a processor within the phone. *Id.*; Ex. 1005, 2:22–27, 6:3–10, 8:20–27; Ex. 1003 ¶¶ 129–130.

¹⁴ Exhibit 1015 is U.S. Patent Application Pub. No. 2002/0105423 A1 published August 8, 2002. Petitioner cites to pages 233–50. However, we note that this exhibit is marked with page numbers 1–68.

ii. Patent Owner's Contentions

For these limitations, Patent Owner provides several arguments. Patent Owner contends that the recited “driving information” includes “detected driving events, including driving anomalies” associated with how the vehicle is driven. PO Resp. 29 (citing Ex. 2001 ¶ 97). Because of this, Patent Owner contends that Curry does not teach the mobile telecommunications device is configured to process [1.7] or log driving information [1.1] because Curry’s remote server processes driving information. PO Resp. 30–32, 37–38. According to Patent Owner, “Curry does not disclose or suggest that processing according to the claims is performed on the mobile device itself.” *Id.* at 37 (citing Ex. 1005, 3:2–23). Patent Owner contends that Curry’s “*remote server* processes raw data sent to it by Curry’s mobile phone.” *Id.* at 38 (emphasis added) (citing Ex. 1005, 3:2–4:5, Figs. 1–2; Ex. 2001 ¶¶ 112–113). Patent Owner adds that combining Curry with Rabu fails to solve these problems because “Rabu merely determines a holder status and a holder motion status for a mobile device, using the device’s orientation angle and frequency spectrum while in a holder, respectively, and from those statuses, the mode the device may be in (e.g., standing still, walking, or driving).” *Id.* at 38–39 (citing Ex. 1013, 7:31–60, Figs. 5, 8–9; Ex. 2001 ¶¶ 114–115).

In its Sur-reply, Patent Owner adds that “Curry is silent about its phone detecting and preventing unsafe driving behavior based on the processing of driving information related to actual *vehicle* behavior (*how* the vehicle is driven).” PO Sur-reply 1 (emphases in original). Patent Owner adds that even if “speeding, abnormal acceleration and sharp turns” can be said to be “driving information,” this determination is clearly done off of

Curry's phone by Curry's server. PO Resp. 31 (citing Ex. 1005, Figs. 1–2, 9:23–28; Ex. 2001 ¶ 100).

Additionally, Patent Owner argues that claim element [1.3] requires “a user interface” of the mobile phone. PO Resp. 32 (citing Ex. 1001, 31:42–48). Patent Owner contends that Petitioner repeatedly cites to the user interface of Curry's server, not Curry's phone. *Id.* at 32–33 (citing Ex. 1005, 8:5–18, 9:23–28, 10:2–5, 21:23–25; Ex. 2001 ¶ 104).

iii. Discussion

To start, Curry's Figure 1, reproduced below, illustrates an example of Curry's system.

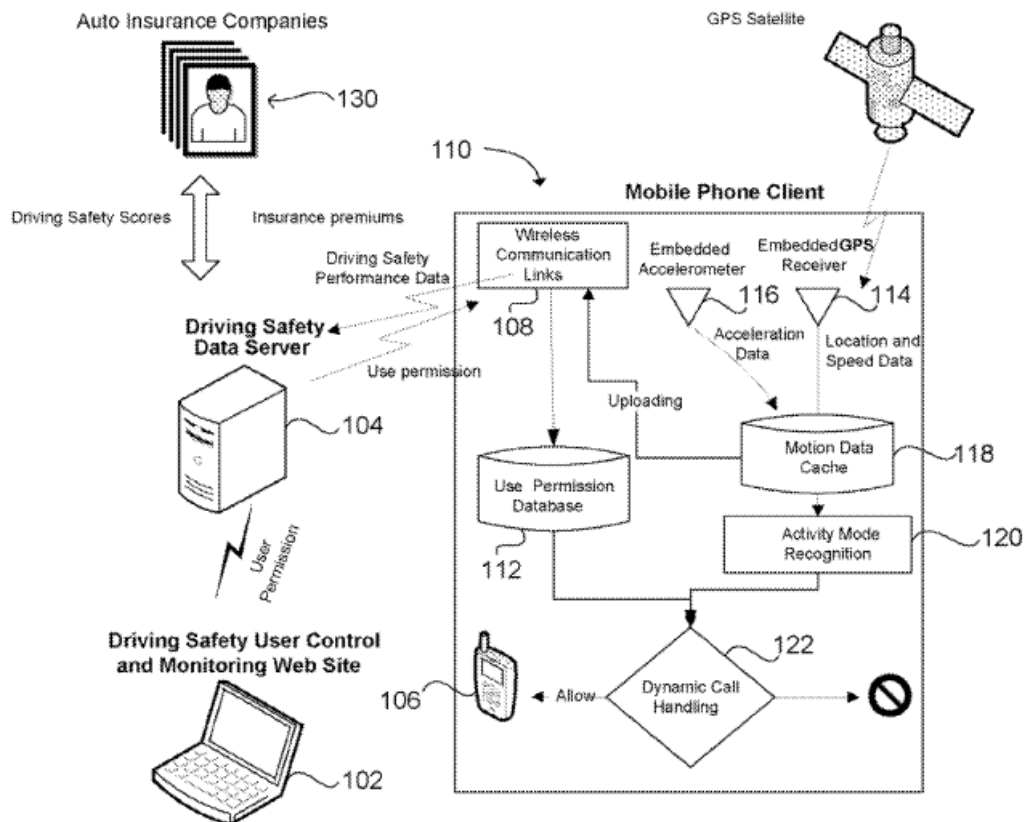


Figure 1 shows data server 104, user control web site 102, and mobile client unit 110 on GPS-enabled mobile phone 106, with GPS 114 and

accelerometer 116 sensors, and wireless connection 108. Ex. 1005, 7:30–8:23. Curry discloses:

[w]hen a call is made or received using a mobile phone 106, the *mobile phone client 110 can record location, speed and acceleration data from sensors embedded in the wireless device*, such as a GPS sensor 114 and accelerometer 116.

Id. at 8:30–9:3 (emphases added).

Based on at least this disclosure, we agree with Petitioner that Curry’s mobile telecommunications device includes accelerometer 116 sensors and GPS Receiver 114 that teach a sensor set [1.2] comprising “an image sensor, an audio sensor, an accelerometer or a positioning module, or a combination thereof.” Ex. 1005, 7:30–8:23.

With regard to a processor [1.4], we observe Curry teaches that “[m]odules may also be implemented in software for execution by various types of processors.” Ex. 1005, 6:3–4. We credit Dr. Michalson’s testimony that

[a] POSITA would have also understood and found obvious that the Curry-Rabu-Katayama phone includes a processor, at least because Curry explains that “the term ‘mobile phone’ can include any type of electronic mobile computing device,” and because a POSITA would have understood that “[a]t the most basic level, a computer is a device consisting of...[a] processor to interpret and execute programs...[a] memory...[and a] mechanism for transferring data....”

Ex. 1003 ¶ 130 (citing Ex. 1005, 6:3–10; Ex. 1015, 4). We find that Dr. Michalson’s testimony is consistent with Curry’s teaching that modules may be executed as software by processors, and “[t]he mobile device control module can be downloaded and operated on the wireless device[.]” Ex. 1005, 3:13–15.

With regard to the recited user interface [1.3], we find that Curry teaches “[t]he term ‘mobile phone’ can include any type of electronic mobile computing device that may be used while traveling in a vehicle.” Ex. 1005, 7:24–26. Petitioner notes in the Petition that Curry teaches the iPhone 3G smart phone from Apple as an example of a mobile phone. Pet. 6 (citing Ex. 1005, 2:1–27), 59. Petitioner further relies on the testimony of Dr. Michalson, who testifies that “the iPhone 3G . . . included a user interface in the form of a touchscreen and various buttons enabling a user to interact with downloaded applications.” Ex. 1003 ¶ 226 (emphasis omitted) (citing Ex. 1005, 1:22–27; Ex. 1078, 21–47; Ex. 1079, 2–3; Ex. 1080, 16–35, 87–92), *see id.* ¶ 121 (“[T]he combination [of Curry-Rabu-Katayama] includes a mobile phone (‘mobile telecommunications device’), which may be ‘any type of electronic mobile computing device that may be used while traveling in a vehicle’; for example, an ‘iPhone 3G smart phone.’”). Additionally, Petitioner explains that “Curry describes multiple embodiments in which a phone determines a start of a driving period . . . based on user inputs received through the phone’s user interface (e.g., a user accepting a phone call, or manually switching between activity modes using the phone’s touch screen and GUI).” Pet. 31. In this regard, we find that Petitioner has sufficiently explained how Curry discloses a mobile telecommunications device, such as the iPhone 3G, with a “user interface” [1.3].

Next, we determine that Curry discloses “driving information” as recited in limitation [1.7] and the preamble [1.1]. Patent Owner asserts that “[t]his driving information may include detected driving events, including driving anomalies.” PO Resp. 29. Patent Owner further contends that “‘derived driving information’ is a specific term defined in the specification

to include more than raw sensor data and, when properly read in the claims as a whole, includes information regarding ‘how the vehicle is driven,’ including ‘occurrence of a predetermined event’ and vehicle behavior.” PO Sur-reply 12. Patent Owner argues that Curry’s disclosure is limited to user behavior rather than driving information. *See* Sur-reply 13 (“Petitioner mischaracterizes ‘driving information’ as ‘driving behavior information’ to inaccurately map ‘talking...or texting...while driving’ to the claims, that is, what a user is doing on the phone instead of what a vehicle is determined to be doing by processing sensor data to derive driving information, as required by the claims.”). We disagree, for the reasons explained below.

Turning to Curry, Figure 3 is reproduced below.

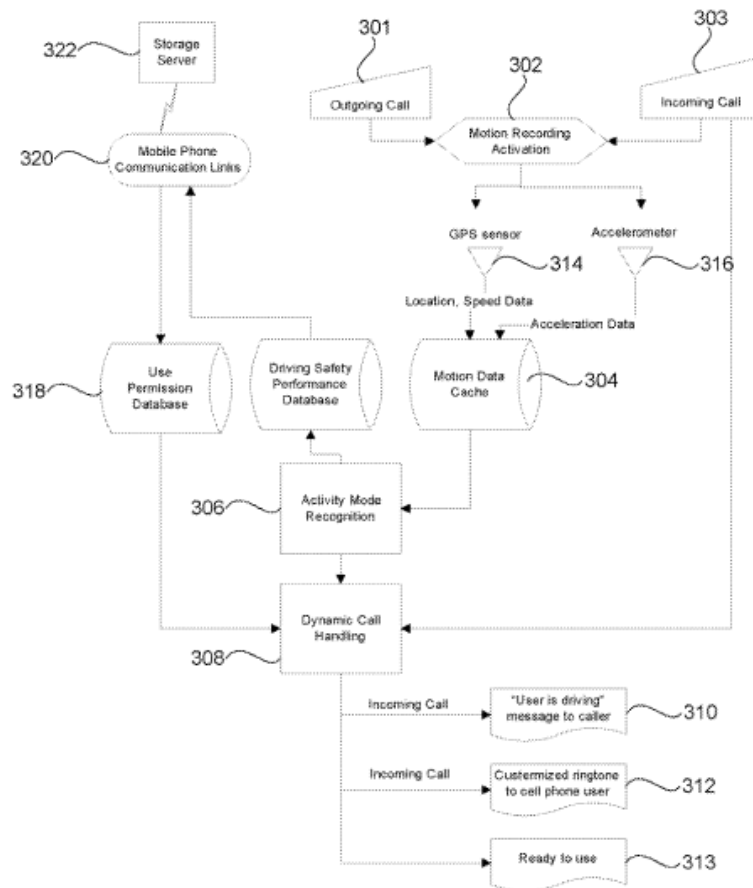


FIG. 3

Figure 3 is a flow chart showing “a driving safety monitoring system *on a mobile phone client.*” Ex. 1005, 5:7–8 (emphasis added), 13:20–21. With reference to Figure 3, Curry teaches that motion recording may be directly activated at 302 *by the user* or through an automated process by the mobile phone client. Ex. 1005, 13:20–24 (emphasis added). One example of activation is “when an outgoing call 301 is made or an incoming call 303 is received.” *Id.* at 13:24–26. Once activated, GPS receiver 314 collects location and speed data of the mobile device, and accelerometer 316 collects acceleration/deceleration data. *Id.* at 13:27–29. Curry further teaches that

these motion measurements may be stored in a local motion data cache and used by activity mode recognition module 306 to estimate the type of activity—driving, walking, running, etc. *Id.* at 13:29–33. Additionally, Curry teaches that the activity mode can be “recognized in real-time [and] the dynamical call handling module 308 can allow or disallow users to receive or make a call, text a message[,], play games, or use other components or software programs on a mobile computing device such as a mobile phone.” *Id.* at 14:5–8.

Curry also teaches that a “driving safety evaluation module can be used to perform a statistical analysis on collected raw driving data” to “calculate corresponding safety scores.” Ex. 1005, 7:13–15; *see also id.* at 9:31–33 (“Based on a statistical analysis method, the raw driving performance data of a user of the mobile phone 106 can be processed to provide a driving safety index or score for the user.”).

Curry further discloses that “[o]ne of the key challenges is how to distinguish driving versus walking.” Ex. 1005, 16:23–24. According to Curry, this is because

[i]f only GPS data are used in activity mode recognition, it is easy to identify driving mode when the speed is high (e.g. greater than 15 miles/hour). However, when the moving speed is low, it is difficult to distinguish driving, walking or running modes. On the other hand, the accelerometer data can be used to effectively recognize walking and running modes. But when using accelerometer data only, it can be difficult to distinguish if the car/user is moving at a relatively constant speed or remaining substantially stationary.

Id. at 16:26–33. To address this challenge, Curry explains that information from GPS and accelerometer sensors may be combined to precisely identify the type of activity. Figure 5 of Curry is provided below:

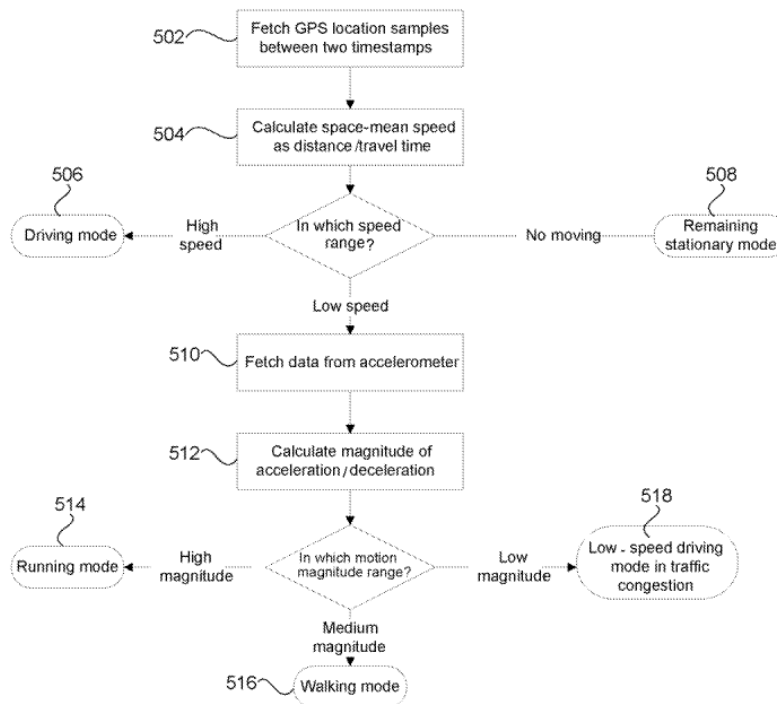


FIG. 5

Figure 5 is a flow chart depicting how to combine two sources of data from the embedded GPS receiver and accelerometer *in a mobile phone* to precisely identify the type of motion. *Id.* at 5:12–15. Referring to Figure 5, Curry teaches that “GPS location data are first fetched from different timestamps 502, and a *space-mean speed measure* is calculated 504 as *traveled distance divided by time interval.*” *Id.* at 17:2–4 (emphasis added). Curry goes on to teach that “[i]f the *space-mean speed* is in a *high-speed range*, then the user is likely to be in *driving mode* 506.” *Id.* at 17:4–5 (emphases added). Curry further discloses that “[i]f a GPS measurement gives a median range space-mean speed (e.g. 1 mph – 15 mph), then accelerometer data need to be fetched 510 and the *magnitude of acceleration/deceleration* is calculated 512 for the same data collection time

interval.” *Id.* at 17:7–10 (emphasis added). According to Curry, “[i]f the motion magnitude is in the medium range, then the user is walking 516, otherwise, the user is either driving at low speed purposely or *driving under traffic congestion conditions* 518.” *Id.* at 17:11–13 (emphasis added).

Based on at least these teachings discussed above, we find Petitioner has shown how Curry discloses that the *mobile telecommunications device is configured to* (1) “log driving information associated with a vehicle” [1.1]; and (2) “process the sensor data from the sensor set during the driving period to derive driving information associated with how the vehicle is driven” [1.7].

Patent Owner contends, with reliance on Mr. Wilson’s testimony, that “to the extent that any processing is disclosed in Curry, a remote server processes raw data sent to it by Curry’s mobile phone.” PO Resp. 38; *see* Ex. 2001 ¶¶ 112–113. Yet, Mr. Wilson testified during cross-examination that Curry’s mobile phones could perform processing. Ex. 1084, 63:6–13 (“It’s my opinion that – *I mean, technically, it [the mobile phone] could perform the processing, you know, as, you know, Wright points out.*”) (emphasis added). In this respect, Mr. Wilson’s cross-examination testimony is consistent with Curry’s disclosure that modules, caches, and databases may be located on either the mobile device or remotely, e.g., driving safety server 104, “based on a tradeoff between the complexity of the mobile device and the amount of information communicated on the mobile device’s network.” Ex. 1005, 12:3–10. Indeed, Curry expressly teaches that “[t]he actual location of the modules, caches, and databases can be decided based on engineering and business needs.” *Id.* at 12:16–18. According to Curry, “[b]y placing more modules, caches, and databases on

the mobile device, it can require a more complex device (having more memory). However, *the amount of communication needed to operate the system can be reduced.*” *Id.* at 12:10–13 (emphasis added). Thus, not only is Curry’s mobile phone *capable* of logging and processing driving information, but doing so reduces the amount of communication needed to operate the system. *Id.*

Further, we find that Curry teaches the activity mode can be “*recognized in real-time . . . [and] the dynamical call handling module 308 can allow or disallow users to receive or make a call, text a message[,] play games, or use other components or software programs on a mobile computing device such as a mobile phone.*” Ex. 1005, 14:5–8 (emphasis added). In this way, we do not agree with Patent Owner that Curry is limited to post-processing of sensor data because Curry’s express disclosure contradicts Patent Owner’s position, indicating that Curry’s determination of activity mode can occur in real-time. *See* PO Resp. 38.

Additionally, we find that the calculation of the driving safety index or score for the user, “space-mean speed measure . . . as traveled distance divided by time interval,” or the calculation of “the magnitude of acceleration/deceleration” disclose “driving information” recited in claim 1. Ex. 1005, 17:1–10. Curry teaches expressly that “[t]he data in the motion data cache can be compared with the user permission data to enable a *driver safety statistic to be calculated* [(e.g., driving information)] based on when and where the wireless computing device was used and the motion of the device.” *Id.* at 3:27–30 (emphasis added). As discussed, we find Curry’s disclosure supports Petitioner’s position that this calculation may be performed in real-time by the mobile device. Further, as shown in Figure 5

of Curry, driving information is also calculated (i.e., derived) from processing the raw sensor data from the sensor set (GPS or/and accelerometer). *See id.* at Fig. 5. And the derived information is associated with how the vehicle is driven, including if the vehicle is being driven at a low speed. *Id.* at 17:11–13.

Based on the parties’ contentions and complete record evidence, we agree with Petitioner’s analysis and determine that Curry teaches or suggests elements [1.1], [1.2], [1.3], [1.4], and [1.7].

b. determine, based on at least one of the inputs received by the user interface and sensor data from the device’s sensor set, a start of a driving period during which the mobile device is removably attached to the vehicle and the vehicle is in use [1.6]

Claim 1 also requires that the mobile telecommunications device is configured to “determine, based on at least one of the inputs received by the user interface and sensor data from the device’s sensor set, a start of a driving period during which the mobile device is removably attached to the vehicle and the vehicle is in use.” Ex. 1001, 31:53–57.

i. Petitioner’s Contentions

For these limitations, Petitioner asserts that Curry’s client 110 enables phone 106 to determine, “based on user inputs (e.g., accepting phone call, manually changing activity modes) and sensor data (e.g., ‘location, speed, and acceleration data’) whether an associated vehicle is being driven.” Pet. 32 (citing Ex. 1005, 7:5–22, 8:30–9:33, 9:5–11, 13:20–14:26, 16:7–22, Fig. 3; Ex. 1003 ¶ 142). Petitioner explains that Curry’s phone determines a start of a driving period when the phone is located within a moving vehicle, “based on user inputs received through the phone’s user interface (e.g., a user accepting a phone call, or manually switching between activity modes

using the phone's touch screen and GUI) and motion sensor data generated by a phone's embedded accelerometer.” *Id.* at 31.

Petitioner further argues that Curry discloses two modes of operation: (1) a “communication” operating mode that allows for normal phone usage and (2) “a GPS monitoring/navigation” mode that restricts calling, texting, and/or software capability on phone 106 to promote driving safety. *Id.* at 12–13 (citing Ex. 1005, 10:15–11:14, 13:20–16:22, Figs. 3–4). Petitioner explains that Curry's phone 106 may switch between the operating modes based on the driving activity. *Id.* at 12–13 (citing Ex. 1005, 13:20–14:4, 16:18–22; Ex. 1003 ¶ 89). For example, Petitioner argues that “Curry further suggests correlating different activity modes with different operating modes, and accounting in nuanced ways for phone usage context when determining driving scores and phone usage restrictions.” *Id.* at 13 (citing Ex. 1005, 3:3–4:28, 15:8–16:33; Ex. 1003 ¶ 90).

Petitioner further asserts that Rabu teaches an accelerometer in a PMD, to determine whether the PMD is docked, resting on a surface, being handled by a person, or located in a moving/stationary vehicle. *Id.* at 8 (citing Ex. 1013, Abstract, 1:1–52, 1:60–2:11, 3:11–28, 6:49–7:6, Figs. 1–8). Petitioner adds that Rabu uses these determinations to choose modes of operation for the PMD to promote driver safety. *Id.* (citing Ex. 1013, 1:53–59, 8:13–10:42, 12:26–43, Fig. 5; Ex. 1003 ¶¶ 65, 69).

Petitioner explains that a POSITA would have configured Curry's phone with “Rabu's dock-status sensing and associated mode-shifting capabilities into Curry's phone to promote safe driving.” *Id.* at 11 (citing Ex. 1003 ¶ 87). Petitioner contends this is because “[c]onsistent with Curry and Rabu's descriptions it would have further been obvious to, upon receipt

of user inputs, leverage motion and orientation data from Curry's accelerometer to allow usage of a docked phone's speaker mode while driving." *Id.* at 14 (citing Ex. 1005, 15:14–17; Ex. 1013, 6:39–43, Fig. 5; Ex. 1003 ¶ 94). Additionally, Petitioner provides several specific reasons why it would have been obvious to enhance Curry's system based on Rabu's teachings:

1. increased user tolerance for Curry's monitoring mode, based on safe but user-friendly levels of restrictions enabled through determination of docking status (USAA-1003, ¶ 97; USAA-1005, 7:5-22, 8:5-18, 11:3-14; USAA-1013, 1:36-2:14);
2. increased likelihood of user participation in Curry's monitoring mode, with correspondingly improved safety (USAA-1003, ¶ 111; USAA-1005, 7:5-22, 8:5-18, 11:3-14; USAA-1013, 1:36-2:14);
3. enhanced reliability of motion detection and related determinations based on data obtained from sensors within a docked phone relative to an undocked phone (USAA-1003, ¶ 99; USAA-1005, 3:24-4:6, 7:5-22, 8:23-28; USAA-1013, 2:61-3:10, 3:46-4:3, 5:61-6:21; USAA-1012, 59:34-43);
4. generation of more nuanced user driving scores taking into account usage violations related to docking status (USAA-1003, ¶ 100; USAA-1005, 7:5-22, 9:31-33, 10:3-12, 11:3-14, 13:3-19; USAA-1013, 2:61-3:10, 3:46-4:3, 5:61-6:21); and
5. enhanced utility for third parties in leveraging more nuanced driving scores in, for example, determining insurance premiums (USAA-1003, ¶ 100; USAA-1005, 4:7-11, 7:5-22, 10:3-12, 11:26-12:2; USAA-1013, 2:61-3:10, 3:46-4:3, 5:61-6:21).

Id. at 15–16 (citing Ex. 1003 ¶ 101).

ii. Patent Owner's Contentions

Patent Owner argues that Curry does not determine “the start of a driving period” because the triggering event (the phone call or text) does not occur at the start of the period in which the vehicle is being driven. PO

Resp. 35 (citing Ex. 1001, 2:9–11, 3:21–23). Patent Owner adds that Curry “merely discloses the start of a recording period, which is not the entire period in which the vehicle is being driven as required by the claims.” *Id.* at 35 (citing Ex. 1005, 14:17–21, Fig. 2; Ex. 2001 ¶¶ 106–108), 36 (“Curry simply records raw sensor data for some arbitrary period of time that is untethered to the claimed driving period.”) (citing Ex. 1005, 16:7–13). Patent Owner also contends that Rabu and Katayama do not resolve Curry’s deficiencies. *Id.* at 36–37.

Patent Owner further contends that Petitioner relies on impermissible hindsight for the rationale to combine the references. PO Resp. 56. More specifically, Patent Owner contends that “[a] POSITA would not have been motivated to look to Curry to arrive at the ’369 patent’s claims because Curry intentionally limits the use of sensor data until a phone call is received or made.” PO Resp. 57 (citing Ex. 1005, 3:2–4:28, 14:28–15:7, 16:7–13, Fig. 4). Patent Owner further argues that

a POSITA would never have picked up Rabu . . . for its teaching of determining a frequency spectrum of a phone, comparing that frequency spectrum to a database of frequency spectra to determine motion status and mode of operation, and further using such data to distinguish whether the device is docked, on a surface, being handled by a person, or located in a moving vehicle.

Id. 57–58 (citing Ex. 2001 ¶ 134). Patent Owner argues “nothing in Curry suggests that using Rabu’s frequency analysis to determine holder status and holder motion status would be better than using GPS and accelerometer data at the time of a phone call[.]” *Id.* at 58.

Separately, Patent Owner contends a POSITA would not have had a reasonable expectation that Petitioner’s proposed combination would have

been successful. PO Resp. 46 (citing Ex. 2001 ¶ 125). Patent Owner argues that a POSITA would have recognized that this combination “would have been time consuming, required significant resources with a fairly low probability of success, and created significant technical hurdles, the solutions to which are nowhere evidenced in either Curry, Rabu, or Katayama.” *Id.* at 47 (citing Ex. 2001 ¶ 126).

iii. Discussion

Based on the complete record, we find that Curry expressly teaches the “start of a driving period” when a user activates the motion recording process directly, such as by initiating a call (e.g., inputs received by the user interface) and then GPS sensor and accelerometer begin recording. Ex. 1005, 13:20–26 (“If the mobile phone is not in monitoring mode, the motion recording process can be activated 302 on the phone. *This may be accomplished by the user of the phone*, or through an automated process by the mobile phone client when a selected type of motion is detected. For example, the reporting process may be activated when an outgoing call 301 is made or an incoming call 303 is received.”) (emphasis added). As discussed above, Curry’s system includes a mobile client unit 110 on GPS-enabled mobile phone 106, with GPS 114, accelerometer 116 sensors, and wireless connection 108. Ex. 1005, 7:30–8:23. Curry teaches that “[b]y utilizing GPS and accelerometer sensors embedded in mobile phones to monitor driving safety performance, an integrated and economical solution can be created to detect and prevent unsafe driving.” *Id.* at 7:5–8. Curry further discloses that a “monitoring mode” may be directly activated by the user, such as by receiving or making a call. *Id.* at 13:20–25. During this monitoring period, Curry’s “GPS receiver 314 can collect location and speed

data of the mobile device . . . [and] accelerometer 316 can collect acceleration/deceleration data in different axes.” *Id.* at 13:27–29. Curry adds that “[e]ach motion measurement from the GPS sensor and accelerometer can be associated with a timestamp, and stored in a local motion data cache 304 for each pre-specified sampling interval.” *Id.* at 13:29–31. In addition, referring to Figure 4, Curry teaches that

[r]ight after an *incoming phone or text message is received or an outgoing phone call is made, the GPS sensor and accelerometer can start to record a motion time series*. Regardless if the phone communication process (i.e. phone call or text message) is complete or not, the sensors can continue to collect the data for an extended time period, e.g. 6 minutes, to determine the type of the current activity.

Id. at 16:8–13 (emphases added).

We find unavailing Patent Owner’s argument that Curry is distinguishable because Curry’s recording occurs after the start of a driving period. Patent Owner’s arguments are premised on a construction of “start of a driving period” that requires the driving period to be the *entire* driving period for the vehicle. *See supra* Sect. II.B.1; PO Sur-reply 4; PO Resp. 33. As discussed, we have not adopted Patent Owner’s construction because this construction contradicts the intrinsic and extrinsic evidence of the ’369 patent. Ex. 1001, 18:40–43; Ex. 1085, 32:3–33:1. Rather, we determine that the “start of the driving period” may occur after the vehicle is in use or operation. *See supra* Sect. II.B.1.

In addition, we are not persuaded that Petitioner relies on impermissible hindsight for the proposed combination of Curry and Rabu. Patent Owner contends that a POSITA would not look to Curry because “Curry intentionally limits the use of sensor data until a phone call is

received or made.” PO Resp. 57 (citing Ex. 1005, 3:2–4:28, 14:28–15:7, 16:7–13, Fig. 4). However, even reading Curry’s disclosure this way, we find, as discussed, that Curry’s recording of sensor data after a call is received/made teaches or suggests the “start of a driving period” as recited in claim 1 of the ’369 patent and construed in our discussion above.

Next, we address Patent Owner’s arguments that a POSITA would not consider Rabu because of Rabu’s frequency spectrum analysis. *See* PO Resp. 57–58. As a threshold matter, Patent Owner contends that Petitioner’s proposed combination requires that a POSITA incorporate or consider Rabu’s frequency spectrum with the teachings of Curry. *See* PO Sur-reply 16 (“Petitioner walks back its original obviousness position, which relied on Rabu’s frequency analysis, to rebut [Patent Owner’s] assertion that a POSITA would have considered a Curry-Rabu combination to be too unreliable for practical use. Since filing its Petition, Petitioner has relied on Rabu’s frequency analysis of ‘motion data from its accelerometer’ to combine Rabu’s ‘mode-shifting capabilities’ with Curry to ‘restrict phone interactions’ and ‘promote safe driving.’”).

Petitioner disagrees with Patent Owner’s understanding of the Petition. In its Reply, Petitioner asserts that the “Petition therefore made clear that the Curry-Rabu-Katayama phone would have leveraged an accelerometer (present in Curry’s phone) to use the same functions for activity mode recognition.” Pet. Reply 16–17. According to Petitioner, “Curry-Rabu-Katayama relies on Rabu’s teachings with respect to detecting holder status based on orientation angle, but does not require exclusive reliance on specific techniques that use frequency spectra.” *Id.* at 21. At the oral hearing, Petitioner reiterated that the Petition relies on Rabu’s use of

accelerometer data, not Rabu's frequency spectrum analysis. Tr. 13:4–10 (“Curry already describes using accelerometer data to determine a change in activity from, for example, stop to driving, and further expressly states at column 16 . . . that its system would have been capable of using acceleration data to determine the change and then further estimate the motion types before or after the change. In other words, Curry already describes motion status information derived from accelerometer data.”).

In the Petition, we observe Petitioner explicitly argues that “a POSITA would have configured the Curry-Rabu-Katayama phone to determine, based on user inputs and orientation and motion data *from an accelerometer* a start of a driving period during which phone 106 is removably attached to the vehicle via a docking station and the vehicle is in use.” Pet. 31 (citing Ex. 1003 ¶ 139; Ex. 1005, Abstract, 2:3–4:28, 10:15–11:14, 13:20–16:33, 17:30–18:7, Figs. 1, 3, 4, 6; Ex. 1013, 3:1–10, 4:21–33, 8:13–10:42, Figs. 1, 4–5, 7–8) (emphasis added). Petitioner adds that limitation [1.6] is met “by a configuration of the Curry-Rabu-Katayama phone in which the phone uses orientation and motion data from *its accelerometer to determine both vehicle motion and phone docking status upon*, e.g., a user accepting a phone call while driving (i.e., concurrent use of orientation data and user input data).” *Id.* (Ex. 1003 ¶ 139) (emphasis added). In addition, Petitioner contends that “the Curry-Rabu phone would leverage orientation and motion data from *its accelerometer* to determine both vehicle motion and phone docking status.” *Id.* at 11–12. As such, we agree with Petitioner that the arguments in the Petition are consistent with Petitioner's position that the combination of Curry and Rabu does not rely

on Rabu's frequency spectrum analysis teachings, but rather focuses on the use of accelerometers.

We note that our Decision on Institution refers to Rabu's frequency spectrum analysis in response to the arguments presented by Patent Owner in the Preliminary Response. Inst. Dec. 32. For example, in the Institution Decision, we observed that

Patent Owner further contends that a POSITA would not have looked to Rabu for insight to arrive at the '369 claims because the use of frequency spectrum data to determine motion and orientation of a phone would not have been necessary to arrive at the claims of the '369 patent." Prelim. Resp. 57 (citing Ex. 1001, Abstract). According to Patent Owner, "the frequency spectrum technology would have been considered excessive by a POSITA at the time of the '369 invention. *Id.*

Id. at 38. To the extent that Patent Owner contends the Institution Decision incorporates Rabu's frequency spectrum analysis into the Petition, we disagree. *See* PO Sur-reply 17 n.1. Rather, it is the Petition, not the Board that defines the metes and bounds of an *inter partes* review. *Koninklijke Philips N.V. v. Google LLC*, 948 F.3d 1330, 1336 (Fed. Cir. 2020).

Moreover, the institution of an *inter partes* review is based on a preliminary record, which addressed Rabu's frequency spectrum analysis in response to Patent Owner's arguments in the Preliminary Response. The parties' positions and evidence were further developed by both after institution. As such, the post-institution briefs (including Patent Owner's Sur-reply) allowed both parties to supplement the record and clarify points of dispute, including any misunderstanding regarding the grounds presented in the Petition.

With this in mind, we turn next to Rabu's teachings relied upon by the Petitioner. Rabu's Figure 4, reproduced below, shows a block diagram of functional components of a PMD. Ex. 1013, 2:25–26.

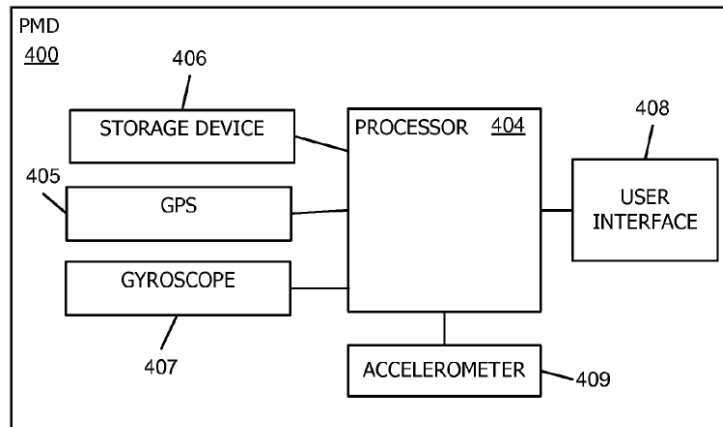


FIG. 4

Figure 4 shows PMD 400 includes accelerometer 409. *Id.* at 4:15–20. Rabu teaches that

[a]ccelerometer 409, which can be of generally conventional design, may be a single axis accelerometer or a multi-axis accelerometer. In some embodiments, accelerometer 409 can be implemented as a micro electromechanical system (MEMS) device embedded in PMD 400. Accelerometer 409 can measure acceleration due to gravity. Based on that measurement, processor 404 can determine the angle it is tilted at with respect to vertical, horizontal, or any other reference plane.

Id. at 4:21–29 (emphases added). Rabu further teaches that the angle of the PMD can be used to determine whether the PMD is docked or held. *Id.* at 7:16–20. For example, Figure 6 of Rabu is reproduced below, and shows a flow diagram of Rabu's method. *Id.* at 2:31–33.

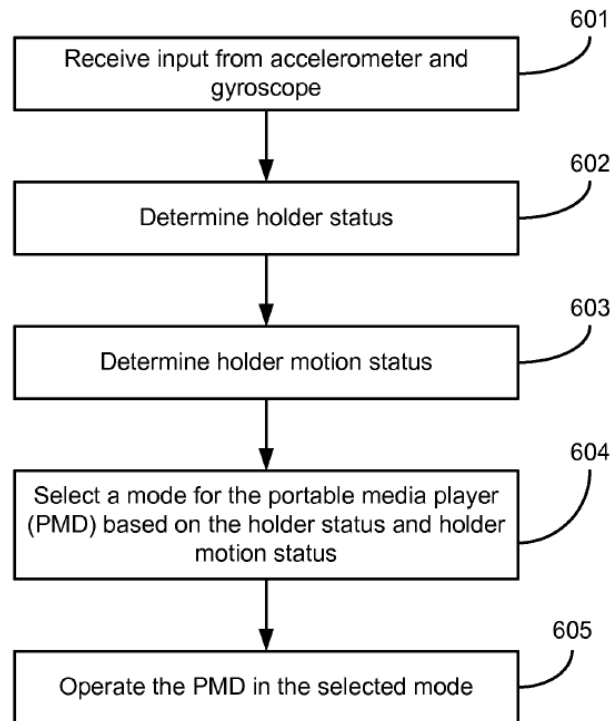


Figure 6, reproduced above, shows the main steps of the invention's operation. *Id.* As shown above, at block 601, the PMD can receive input from one or more motion sensors, e.g., an accelerometer and a gyroscope. *Id.* at 7:11–13. “[T]he input can indicate orientation angle and motion information of the PMD.” *Id.* at 7:14–15. Rabu teaches an example that “if the orientation angle is 15° with the vertical, the PMD is held in a dock, if orientation angle is 90° to vertical the PMD is resting on surface, and if the orientation angle is varying then the PMD is being handled by a person.” *Id.* at 7:16–20. At block 602, the PMD can determine a holder status and at block 603, the PMD can determine whether it is in a moving vehicle, in a stationary vehicle, being handled by a moving person, or being handled a stationary person. *Id.* at 7:15–16, 7:22–26.

We further note that Dr. Michalson testifies that “[a] POSITA would have readily found relevant solutions within Rabu, and would have expected

success in incorporating Rabu's solutions within Curry." Ex. 1003 ¶ 92. Dr. Michalson explains this is because Rabu teaches that "a smart phone processor leveraging a 'generally conventional' accelerometer such as that found in Curry's phone can be used to determine both an orientation angle and motion status of the smart phone." *Id.* (citing Ex. 1013, 3:1–10, 4:21–33, Figs. 1, 4). We credit Dr. Michalson's testimony in this respect because it is consistent with and supported by the disclosures of Curry and Rabu cited and discussed therein.

Moreover, these disclosures are consistent with and support Petitioner's reasoning for the combination that "Rabu would have motivated a POSITA to *enhance Curry's phone* by configuring it to leverage orientation data from the *same accelerometer* to determine whether the phone is removably attached to the vehicle." Pet. 32 (emphases added); Ex. 1003 ¶ 140. This is because Curry's mobile device already includes accelerometers. *See* Ex. 1005, Fig. 1. Petitioner explains that "[c]onsistent with both Curry and Rabu, the Curry-Rabu phone would appropriately restrict phone interactions depending on the determined status." Pet. 12; Ex. 1003 ¶ 88.

In addition, Dr. Michalson explains that

[t]o further promote safe driving, Curry suggests correlating different activity modes (e.g., stop, driving) with different operating modes (e.g., different levels of restrictions on phone use), and accounting for the context of phone usage when generating a driving score for a particular driver. USAA-1005, 2:3-3:28, 15:8-16:33. For example, in one embodiment, Curry contemplates an all-or-nothing approach to restrictions on phone activity when phone 106 is placed in a monitoring operating mode, [and] it elsewhere recognizes that such an approach is not always appropriate, and that it can be better to correlate different

driving contexts with different phone restrictions. USAA-1005, 2:3-3:28, 15:8-16:33.

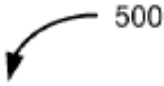
Ex. 1003 ¶ 90. Dr. Michalson further testifies that a POSITA would have looked to Rabu for a more nuanced approach because “Rabu’s defined modes of operation include appropriate levels of restrictions on phone use.” *Id.* ¶ 94. According to Dr. Michalson, if Rabu’s phone “is being held by the driver,” then it can “prevent the driver from sending or receiving text messages while driving.” *Id.* (citing Ex. 1013, 12:38–43). Or, if “the phone is held within a dock located within the vehicle, [a POSITA would have found it obvious to decide to] change the phone’s mode of operation to one involving relatively fewer restrictions to phone use. *Id.* (citing Ex. 1013, 3:1–10, 4:21–33, 6:39–43, Figs. 1, 4). Dr. Michalson further explains that

[t]he Curry-Rabu combination would have increased user tolerance for Curry’s monitoring techniques. USAA-1005, 7:5-22, 8:5-18, 11:3-14; USAA-1013, 1:36-2:14. For example, Rabu’s docking status enabled a determination of when a phone 106 is docked within a moving vehicle, which can then be inferred to mean that a user is not presently using the phone 106 for texting when the vehicle is being driven. Rabu’s docking status would have also improved Curry’s use of an estimated context of mobile phone use in identifying unsafe driving behaviors. For example, the docking status would have enabled differentiation between (i) a user holding and using the phone while driving and (ii) using the phone while docked and while driving. The second scenario in this example is less likely to distract the user and less likely to be determined to represent an unsafe driving behavior.

Id. ¶ 97.

Consistent with Dr. Michalson’s testimony, we observe Curry contemplates switching between communication mode and GPS mode depending on the complexity of the driving conditions. Ex. 1005, 15:19–21.

For example, Curry discloses that commercial fleet drivers may need to communicate with dispatchers or other drivers using a cell phone while driving. *Id.* at 15:8–10. Rabu specifically addresses the need for a multi-modal approach for PMDs. For example, Rabu’s Figure 5 is reproduced below:



PMD Modes	Description
A	PMD handheld while located in a moving vehicle.
B	PMD resting in a moving vehicle
C	PMD handheld while person is in motion.
D	PMD docked in a moving vehicle
E	PMD docked in a desktop dock and stationary
F	PMD resting on a stationary surface
G	PMD docked in a stationary vehicle

FIG. 5

Figure 5 is a table listing various modes of operation of Rabu’s PMD. Ex. 1013, 2:28–30. Thus, on the whole, Petitioner has sufficiently articulated a rationale for the combination of Curry’s and Rabu’s teachings as discussed.

In addition, Petitioner has provided citations to the references along with corroborating testimony from Dr. Michalson that support its arguments for why and how a POSITA would have combined the prior art disclosures with a reasonable expectation of success. *See* Ex. 1003 ¶¶ 100–116. For example, Dr. Michalson explains that

configuring Curry’s systems to leverage Rabu’s teachings would have required only routine programming knowledge, which was well within the skill of a POSITA prior to the Critical Date. For example, Rabu and Curry both use the same type of hand-held

phone and contain the same types of internal sensors (GPS, accelerometers). Indeed, the change would have amounted to nothing more than the use of a known technique to improve similar devices—in each instance a smart phone equipped with a generic accelerometer—in a similar way, and combining prior art elements according to known methods to yield the predictable results described above.

Ex. 1003 ¶ 115 (emphases added).

Patent Owner contends that introducing more modes into Curry would have created more opportunities for failure. PO Resp. 47 (citing Ex. 2001 ¶ 127). Patent Owner argues that a POSITA would have understood Curry teaches that selecting the wrong activity mode “can result in incorrect disruption of cell phone service which can lead to unpleasant user experiences and further limit system deployment.” *Id.* (citing Ex. 1005, 10:32–11:2).

Still, neither Patent Owner nor Mr. Wilson explains sufficiently how having more modes would create more opportunities for failure. Instead, these unsupported conclusory statements presume that additional modes must increase the likelihood of choosing the incorrect activity mode when there is, in fact, no persuasive support for this conclusion.

Moreover, trade-offs regarding features, costs, manufacturability, or the like, do not necessarily prevent the combination. *See Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (“[A] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.”); *Winner Int’l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000) (“The fact that the motivating benefit comes at the expense of another benefit, however, should not nullify its use as a basis to modify the disclosure of one reference with

the teachings of another. Instead, the benefits, both lost and gained, should be weighed against one another.”).

Here, Petitioner has explained the benefits of modifying Curry’s phone to use the accelerometer data to determine whether the phone is docked within a moving vehicle. *See* Pet. 16–17. We weigh those advantages over Patent Owner’s proposed disadvantages because Petitioner’s arguments are supported sufficiently by the record (*see id.*), whereas Patent Owner’s and Mr. Wilson’s conclusory statements are not. Also, as discussed in detail, we are not persuaded by Patent Owner’s arguments based on the use of Rabu’s frequency spectrum analysis with Curry. PO Resp. 45–51. Petitioner’s arguments in the Petition rely upon Rabu’s use of Curry’s accelerometer data to determine whether the PMD is in a holder or handheld. *See* Pet. 13 (“[T]he POSITA would have found relevant solutions and further motivations within Rabu, and would have expected success in incorporating Rabu’s solutions within Curry. USAA-1003, ¶92. For example, Rabu describes discerning phone usage context from accelerometer data indicating phone orientation angle and motion status, and changing the phone’s operating mode to account for that context.”). Patent Owner’s arguments regarding the experimentation and disadvantages of incorporating Rabu’s frequency spectrum analysis into Curry, therefore, do not address Petitioner’s arguments regarding the use of an accelerometer.

Based on the complete record, Petitioner has sufficiently explained how the asserted combination of Curry and Rabu teaches or suggests limitation [1.6].

c. wherein the driving information is derived without data from the vehicle sensors [1.9]

Claim 1 further recites “wherein the driving information is derived without data from the vehicle sensors.” Ex. 1001, 31:63–64.

Petitioner argues that Curry’s wireless device processes sensor data during a driving period to derive driving information. Pet. 40–41 (citing Ex. 1003 ¶ 158; Ex. 1005, 7:5–22, 8:29–10:12, 13:20–16:6, Fig. 1). Additionally, Petitioner argues that “[a] POSITA would have found it obvious to configure a Curry-Rabu-Katayama phone to derive driving information based on its recorded sensor data alone when considering Curry’s disclosures of data obtained by embedded sensors (e.g., accelerometer 116) being used to derive the driving information.”). *Id.* (citing Ex. 1003 ¶ 160; Ex. 1005, Abstract, 2:1–27, 3:24–4:11, 7:5–22, 8:29–10:12, 13:20–16:6, Figs. 1, 3).

Patent Owner does not specifically address element [1.9]. *See generally* PO Resp.

Based on the complete record, we find Curry teaches expressly that “[a]n embedded accelerometer and a GPS receiver are included in the wireless device.” Ex. 1005, 3:6–7. Curry further teaches that “[w]hen a call is made or received using a mobile phone 106, the mobile phone client 110 can record location, speed and acceleration data from sensors *embedded* in the wireless device, such as a GPS sensor 114 and accelerometer 116.” *Id.* at 8:30–33 (emphasis added). The data from the embedded device sensors are recorded in the motion data cache 118 and used by user activity mode recognition program 120 to determine the “context of the mobile phone use.” *Id.* at 9:6–7. Based on the express disclosure, Dr. Michalson testifies

that Curry focuses “on leveraging motion data obtained from sensors embedded in the mobile phone (e.g., accelerometer 116, GPS receiver 114) to derive the driver safety information.” Ex. 1003 ¶ 161 (citing Ex. 1005, Abstract, 2:1–27, 3:24–4:11, 7:5–22, 8:29–10:12, 13:20–16:6, Figs. 1, 3). As such, Dr. Michalson asserts “a POSITA would have understood there to be no need to use data from vehicle sensors to derive Curry’s driving information because its phone includes all of the necessary sensors, processing, and memory to derive the driving information.” *Id.*

Based on the entire record, Petitioner has explained sufficiently with reference to Curry, how Curry discloses element [1.9].

d. memory [1.5], store a selection of the driving information to the memory [1.8], the memory comprises: a long term memory for persistently storing driving information and a short term memory for transiently storing driving information [1.10]

Claim 1 further recites that the mobile telecommunications device contains memory [1.5] and that the mobile telecommunications device is configured to “store a selection of the driving information to the memory” [1.8], and that that memory includes “a long term memory for persistently storing driving information and a short term memory for transiently storing driving information” [1.10]. Ex. 1001, 31:50, 31:61–67.

i. Petitioner’s Contentions

Petitioner contends that “[t]he Curry-Rabu-Katayama phone stores a selection of driving information derived from processed sensor data to local memory (e.g., motion data cache 118) prior to transmission (e.g., to driving safety data server 104).” Pet. 38 (citing Ex. 1003 ¶ 154; Ex. 1005, 7:5–22, 8:29–10:12, 13:20–16:6, Figs. 1, 3; Ex. 1015). According to Petitioner, a POSITA would have found obvious that data stored in Curry’s local memory

includes “a selection of the driving information,” because Curry describes driving information derived “from timestamped motion data associated with pre-specified sampling intervals, and further describes the potential to mark activity estimation results for a given interval for further processing at later times.” *Id.* at 39 (citing Ex. 1003 ¶ 157; Ex. 1005, Abstract, 2:1–27, 3:24–4:11, 7:5–22, 8:29–10:12, 11:3–14, 12:29–16:6, Figs. 1, 3).

Petitioner asserts that Katayama describes a “driving recorder” that records “situation data” that indicates the “surrounding situation or the like of a motor vehicle during a certain period before and after a time of an accident or . . . risk incident” in which “a driver . . . is close to [being] involved in an accident” Pet. 17 (citing Ex. 1024 ¶¶ 1, 11, 58; Ex. 1003 ¶ 70). Petitioner asserts Katayama’s driving recorder includes internal memory 82 that features “temporary data storage section 802” (short term memory) and “situation data storage section 803” (long term memory). *Id.* at 20 (citing Ex. 1024 ¶ 44). Petitioner adds that

[t]o avoid erasing situation data that might prove useful, [Katayama’s] data administration section 804 determines at the “time of recording” whether temporarily stored situation data meets one or more predetermined criteria for long term storage. . . . If so, the recorded situation data is, for example, classified with an identifier marking it as “important,” and then transferred with the identifier to long term “situation data recording section 803. . . .” In contrast, situation data that is marked with an identifier as less than important remains in temporary storage until eventually overwritten.

Id. at 21 (citing Ex. 1024 ¶¶ 1–2, 11–16, 27, 46–50, 54, 83; Ex. 1003 ¶ 76).

Petitioner further explains that

from Katayama, a POSITA would have recognized that in the Curry-Rabu-Katayama phone, a plurality of “selections” of driving information representing specific driving behaviors are

preserved through storage in long-term memory, similar to Katayama’s storage of “important” situation data in its “situation data recording section.”

Id. at 38 (citing Ex. 1024 ¶¶ 44–46; Ex. 1003 ¶ 154).

More specific to limitation [1.10], Petitioner contends that a POSITA would have configured the Curry-Rabu-Katayama phone’s local memory to include a temporary short term memory section and a long term memory section. Pet. 41 (citing Ex. 1024 ¶ 44; Ex. 1005, 6:11–20). Petitioner argues that

the POSITA would have understood and found obvious that both the digitalized “situation data” transiently stored in the Curry-Rabu-Katayama phone’s short term memory section and the digitalized “situation data” persistently stored in the Curry-Rabu-Katayama phone’s long term memory section are derived by processing sensor data received during a driving period (e.g., the driving period discussed above in connection with [1.6]), and constitute “driving information” associated with how a vehicle is driven.

Id. at 43 (citing Ex. 1024 ¶¶ 1–2, 11–16, 27, 46–50, 54, 83; Ex. 1003 ¶ 168) (emphasis omitted). Petitioner asserts that a POSITA would have modified Curry’s device to “record situation data determined to be ‘important’ with a metadata ‘identifier’ marking it as such, and to transfer situation data with that identifier from the local memory’s temporary storage to its long term recording section.” *Id.* at 42–43 (citing Ex. 1024 ¶¶ 1–2, 11–16, 27, 46–50, 54, 83; Ex. 1003 ¶ 166). Petitioner asserts that Curry, modified by Katayama, would retain (e.g. persistently store) important situation data for after-the-fact analysis of accidents and risk incidents. *Id.* (citing Ex. 1024 ¶¶ 1, 27, 46–52). Petitioner adds that configuring the Curry-Rabu phone’s memory in this manner enables effective use of memory. *Id.* at 23–24 (citing Ex. 1003 ¶¶ 113–114; Ex. 1024 ¶¶ 1, 2, 16, 44–51, 53, 57; Ex. 1005,

Abstract, 2:1–27, 3:24–4:11, 7:5–22, 9:31–33, Fig. 1) (alterations in original) (emphases added).

ii. Patent Owner's Contentions

Patent Owner contends that Curry stores sensor information that is raw data, but not information derived from processed sensor data or driving information. PO Resp. 39–40 (citing Ex. 1005, Fig. 1, 8:30–9:33, 11:15–18; Ex. 2001 ¶¶ 116–117), 42–44. Patent Owner argues that raw data from Curry's motion data cache 304 and activity mode recognition module 306 is transmitted to a local driving safety performance database 324 and sent to server 322 for post-processing by the remote server. *Id.* (citing Ex. 1005, 11:15–18, 14:19–23, 16:7–18; Ex. 2001 ¶¶ 118–119); *see also id.* at 43 (“[T]he server of the Curry-Rabu phone-not the phone itself-processes the raw sensor data, determines driving information, detects a driving incident from the driving information, and stores driving information and/or sensor data.”).

Patent Owner further contends that Petitioner has provided no evidence that a POSITA would have recognized that a “plurality of ‘selections’ of driving information representing specific driving behaviors are preserved through storage in long-term memory” in the Curry-Rabu-Katayama phone. *Id.* at 40. Patent Owner contends that “[b]ecause Curry's phone does not detect incidents, ‘important situation data’ would not be determined by Curry's phone and there would be no reason, according to the claims, to persistently store such data.” *Id.* at 44; Ex. 2001 ¶ 159.

Patent Owner further argues that Petitioner relies on impermissible hindsight for the asserted combination and that “Katayama's stark differences from both Curry and Rabu would not have led a POSITA to

combine Katayama with Curry and Rabu, let alone provided any further expectation of success for implementing a mobile telecommunications device for logging driving information.” PO Resp. 46, 56, 58–59 (emphasis omitted); Ex. 2001 ¶ 125. Patent Owner adds that Katayama’s characteristics and features are in direct conflict with the ’369 patent. PO Resp. 51. Patent Owner contends that “Katayama is outside of the desired reach of a POSITA at least because (1) Katayama did not contemplate integration with the vehicle sensors as requiring mitigation; and (2) Katayama is a hardware-based configuration, not a mobile software-defined communications platform.” *Id.* (citing Ex. 2001 ¶¶ 143–144). Patent Owner adds Katayama uses a removable CompactFlash (CF) memory card that could not be used on Curry’s phone, e.g., the 3G iPhone. *Id.* at 54 (citing Ex. 1005, 2:25–27; Ex. 2001 ¶ 150). Patent Owner further argues that Petitioner has not explained how a “POSITA would or could have configured the internal storage in Curry’s iPhone to have the specific configuration disclosed in Katayama.” *Id.* at 54.

In his declaration, Mr. Wilson testifies that Katayama is “prohibitively different” from the ’369 patent because:

(1) Katayama does not disclose a mobile telecommunications device (e.g., mobile phone); (2) Katayama is akin to a black box data recorder that is required to be electrically connected to the sensors of a vehicle; and (3) Katayama requires data from the vehicle sensors.

Ex. 2001 ¶ 139 (citing Ex. 1024, Abstract, ¶ 38, Figs. 4–6). Mr. Wilson further testifies that “[n]either Petitioner nor Dr. Michalson explains . . . why those differences and activities would require only ‘routine knowledge of programming and common electronic components.’” Ex. 2001 ¶ 153.

Separately, Patent Owner argues that Katayama does not teach long term and short term memories (limitation [1.10]) because all categorized data are stored in the same storage section 803. PO Sur-reply 22 (“Katayama’s less important and most important data are not separately stored in long term versus short term storage.”), 27 (citing Ex. 1024 ¶¶ 55, 57, Fig. 5; Ex. 2001 ¶¶ 158–162), 28.

iii. Discussion

Based on the complete record, Petitioner has the better position. As discussed, Curry teaches that driving safety data can be recorded in mobile phones and then transmitted to data servers through communication links. Ex. 1005, 7:8–10. Based on the data stored in the mobile device memory, e.g., motion data cache 118 or local motion data cache 304, Curry teaches that a user activity mode recognition program 120, which resides on mobile phone 106, may estimate the context of the mobile phone use. *Id.* at 9:6–11, 13:27–33, Fig. 1.

The user activity mode recognition program may operate in *real-time* (as opposed to post-processing) to allow or disallow users to receive or make a call, text, etc. *Id.* at 14:5–8. Further, the activity mode may combine information from GPS and accelerometer sensors to precisely identify the *type* of activity. *Id.* at 17:1–2, Fig. 5. As discussed, Curry teaches calculations (e.g., deriving driving information) made with accelerometer data, GPS data, or both to determine whether the user is, for example, driving a vehicle at a slow speed (e.g., driving information). *Id.* at 17:1–14. Additionally, Curry teaches that modules, caches, and databases may be placed on the mobile device or moved to the remote server. *Id.* at 12:3–12. We understand Curry to teach that data, raw or otherwise, may be stored in

caches or databases on the mobile device or remotely, and “[t]he actual location of the modules, caches, and databases can be decided based on engineering and business needs.” *Id.* at 12:16–18.

Next, we turn to Katayama. Patent Owner and Mr. Wilson assert that Katayama is “prohibitively different” from the ’369 patent. PO Sur-reply 21; Ex. 2001 ¶¶ 139–142. To the extent Patent Owner argues that Katayama is non-analogous art, we address this issue first.

“Prior art is analogous if it is from the same field of endeavor or if it is reasonably pertinent to the particular problem the inventor is trying to solve.” *Circuit Check Inc. v. QXQ Inc.*, 795 F.3d 1331, 1335 (Fed. Cir. 2015). A reference is analogous art if either of these two tests is met. *Scientific Plastic Prods., Inc. v. Biotage AB*, 766 F.3d 1355, 1359 (Fed. Cir. 2014). The Federal Circuit has indicated that the scope of analogous art is to be construed broadly. *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1238 (Fed. Cir. 2010) (“The Supreme Court’s decision in *KSR* . . . directs us to construe the scope of analogous art broadly . . .”).

The ’369 patent expressly states that “[t]he present invention relates to methods and systems for *logging driving information associated with vehicle behavior*.” Ex. 1001, 1:22–24 (emphases added). Thus, we find that the field of endeavor is logging driving information associated with vehicle behavior.

Katayama is in this same field. Katayama’s “Field of the Art” section expressly teaches that “[t]his invention relates to a *driving recorder* that *records behavior, a surrounding situation or the like of a motor vehicle* during a certain period before and after a time of an accident or a hiyari hatto

(risk incident).” Ex. 1024 ¶ 1 (emphases added). Therefore, we find that Katayama is analogous art.

We also note that the Background section of the ’369 patent describes data logging devices, or “black boxes,” that can be integrated with the car data network and take inputs from vehicle sensors, or, alternatively, contain their own sensors. Ex. 1001, 1:33–60. However, due to “their expense,” the ’369 patent posits that black boxes in road vehicles are “less prevalent.” *Id.* at 1:54–63. The ’369 patent further states that “the object of the present invention [is] to alleviate the above-mentioned problems, at least in part.” *Id.* at 1:59–60. The ’369 patent includes black boxes in the gamut of data logging devices, but observes that the expense of integration affects the use of black boxes in vehicles. In this way, the ’369 patent treats devices like Katayama’s “Driving Recorder” as data logging devices, rather than differentiating Katayama’s device based on the “stark differences” that are “prohibitively different” as proposed by Mr. Wilson. *See* Ex. 2001 ¶¶ 139–142.

Next, we observe that Katayama describes a driving monitor that records driver behavior and “a surrounding situation” during a period before and after an accident. Ex. 1024 ¶ 1. In Katayama’s system, there are two types of data storage — temporary data storage section 802 and situation data recording section 803. *Id.* at Fig. 5. Katayama teaches that “data administration section 804 determines whether or not the content of the situation data stored in the temporary data storage section 802 meets the predetermined condition,” and if so, the situation data is “transferred from the temporary data storage section 802 to the situation data recording section 803.” *Id.* ¶ 46. Katayama further teaches that

[t]he difference between the temporary data storage section 802 and the situation data storage section 803 is[] *the temporary data storage section 802 temporarily stores the situation data irrespective of the contents of the situation data while the situation data storage section 803 stores the situation data for the record basically without updating the situation data and the situation data is updated after being transferred to other record device* (for example, the detachable record device 7).

Id. ¶ 51 (emphases added).

We understand Katayama to teach the storage of data in *short term* memory at temporary storage section 802 and *long term* memory at situation data storage section 803. This is because, generally, Katayama teaches that data stored at situation data storage section 803 is designed to be kept as “important” data (e.g., a selection of information/data) for transfer to a center computer or other record device, whereas temporary storage section 802 constantly, sequentially erases old data. Ex. 1024 ¶¶ 45, 51, 60. More specifically, Katayama teaches that the long term memory, e.g., situation data storage section 803 may store data without updates until the data is transferred to another recording device (e.g., other record device 7). Ex. 1024 ¶ 51 (“[T]he situation data storage section 803 stores the situation data for the record basically without updating the situation data and the situation data is updated after being transferred to other record device (for example, the detachable record device 7).”).

In the Sur-reply, Patent Owner contends that Katayama’s less important and most important data are not separately stored in long term versus short term storage. PO Sur-reply 22 (citing Ex. 1024 ¶¶ 55, 58, Fig. 5). Patent Owner argues that both types of data are stored in the same storage, and therefore Katayama does not teach long term and short term memories. *Id.* (citing Ex. 1024 ¶¶ 55, 57, Fig. 5; Ex. 2001 ¶¶ 158–162), 28

(“Katayama, does not meet claim elements [1.10], [26.10], and [27.11] at least because it stores all data in the same location and categorizes it differently to ‘effectively utilize memory,’ but Katayama does not disclose a separate persistent memory.”). Patent Owner contends that all data in Katayama’s storage section 802 are categorized by importance using judgment criterion parameters and all categorized data is moved into storage section 803. *Id.* at 27 (citing Ex. 1024 ¶¶ 44, 48, 51, Fig. 5; Ex. 2001 ¶¶ 158–162).

Katayama’s disclosure, however, better supports Dr. Michalson’s testimony and Petitioner’s arguments. We find Katayama teaches that

[t]he data administration section 804 determines whether or not the content of the situation data stored in the temporary data storage section 802 meets the predetermined condition. *Only in a case that the content meets the predetermined condition, the situation data during a certain period before and after the situation data whose content meets the predetermined condition is transferred from the temporary data storage section 802 to the situation data recording section 803 arranged in the internal memory 82 and/or a predetermined area of the removable recording device 7.*

Ex. 1024 ¶ 46 (emphases added). Katayama expressly teaches that situation data is moved from storage section 802 to section 803 “[o]nly in case that the content meets the predetermined condition.” *Id.* This indicates that situation data that does not meet the predetermined condition is not transferred to section 803. *See also id.* ¶ 51 (“[T]he *situation data during a certain period is transferred* from the temporary data storage section 802 to the situation data storage section 803 only after the driver determines the situation as the hiyari hatto (risk incident) of the accident” (emphasis added)). As such, we agree with Petitioner that the situation data transferred

to storage section 803 is transferred from temporary data storage section 802 to a separate storage section 803. In other words, the data is not all stored in the same place as Patent Owner proposes.

We further note that Dr. Michalson testifies that a POSITA would have understood and found obvious that, like Katayama's local memory 82, the local memory featured in Curry's mobile phone 106 has limited capacity, and "must accommodate within that limited capacity continuously and sequentially received information including sensor data." Ex. 1003 ¶ 110 (citing Ex. 1005, 2:22–27, 3:24–26, 8:20–27, 6:3–10, Fig. 1). Dr. Michalson, explains that

[a] POSITA would have found obvious enhancement of the Curry-Rabu phone through implementation both of *Katayama's teachings on partitioning local memory into several sections (including sections for temporary and long term storage)*, and related teachings on data handling, including both the comparison at the time of recording of digitalized sensor data against judgment criteria representative of specific driving behaviors, and storage in appropriate sections of memory of digitalized data with metadata identifiers indicating determinations made through those comparisons.

Ex. 1003 ¶ 104 (citing Ex. 1024 ¶¶ 12, 15, 48, 49) (emphases added). Dr. Michalson adds a POSITA would have found it obvious to store in the Curry-Rabu-Katayama phone a subset of (i.e., selection of) the driving information derived from sensor data since Curry discloses that certain information (e.g., possible violations of use, unsafe driving behavior) are useful to transmit to safety data server 104. Ex. 1003 ¶ 155 (citing Ex. 1005, 8:5–22 ("the driving safety data can be recorded in mobile phones and then transmitted"), 8:29–10:12, 13:20–16:6, Fig. 1; Ex. 1015).

Patent Owner contends that Katayama teaches storage section 803 may be a removable CF memory card that could not be used with Curry's phone. PO Resp. 54. But, we observe that Katayama expressly teaches that the situation data recording section 803 may be "arranged in *the internal memory* 82 or/and a predetermined area of the removable recording device 7." Ex. 1024 ¶ 46 (emphasis added). Katayama teaches expressly that internal memory 82 of CPU 81 may contain the temporary storage section 802 and situation data recording section 803 in different parts of internal memory 82, e.g., partitioned. *Id.* ¶ 46, Fig. 4. Thus, the use of flash memory is optional. *Id.*

Additionally, Patent Owner argues that Katayama is a hardware-based configuration (not mobile phone software based) that relies on vehicle sensors. PO Resp. 54 (citing Ex. 2001 ¶¶ 143–144). While that may be true, Petitioner does not seek to bodily incorporate Katayama's system into Curry. Petitioner relies on Katayama's disclosure of partitioned memory and the selective recording of data into different storage sections 802, 803. Dr. Michalson explains that

a POSITA would have recognized and/or found obvious to leverage Katayama's techniques of using different types or areas of memory for "temporarily stor[ing]" data in one memory location, e.g., a temporary storage section 802 and for long term storage of data, in another memory location, e.g., situation data recording section 803 in the Curry-Rabu Katayama combination. Ex. 1003 ¶173 (citing Ex. 1027, 63–65; Ex. 1037 ¶¶ 42–43; Ex. 1038 ¶¶ 43, 46; Ex. 1024 ¶¶ 44–46, 51, 53, Fig. 5). Dr. Michalson testifies that it was common knowledge to a POSITA that a computer system uses "hierarchical memory" that includes "a combination of memory types to provide the best performance at the best cost." *Id.* ¶ 174 (citing Ex. 1027, 64). Dr.

Michalson further opines that a POSITA would have found it obvious that different types of memories, like Katayama's storage sections 802, 803, "can be combined and configured to balance the access speed, storage capacity, and cost given different use cases and system requirements." *Id.*

¶¶ 174–175. Dr. Michalson also opines that a POSITA would have expected success when incorporating Katayama's teachings into the Curry-Rabu phone because the elements of the combination would perform functions each were known to perform. *Id.* ¶ 120 ("Curry's phone 106 would store sensor data and related information but, in the specific manner taught by Katayama, would identify and preserve information determined to be important in a form of long-term storage.").

With this testimony and supporting evidence in mind, we do not agree with Patent Owner or Mr. Wilson that "Katayama's stark differences from both Curry and Rabu would not have led a POSITA to combine Katayama with Curry and Rabu, let alone provided any further expectation of success for implementing a mobile telecommunications device for logging driving information." PO Resp. 46, 56, 58–59 (emphasis omitted); *See* Ex. 2001 ¶ 141.

Rather, based on the complete record, Petitioner has explained sufficiently with reference to Curry, Rabu, and Katayama, how the asserted combination teaches or suggestions limitations [1.5], [1.8], and [1.10].

e. wherein the short term memory receives driving information at a higher update rate than the long term memory [1.11]

Claim 1 further requires that the short term memory receives driving information at a higher update rate than the long term memory. Ex. 1001, 31:67–32:2.

For this limitation, Petitioner asserts that Katayama's temporary data storage section obtains data more frequently than the long term storage section. Pet. 47 (citing Ex. 1024 ¶¶ 44–46, Fig 5). Petitioner contends the temporary section temporarily stores the situation data irrespective of the contents of the situation data but the situation data is transferred to the storage section “[o]nly in a case that the content meets the predetermined condition[.]” Pet. 47 (citing Ex. 1024 ¶¶ 46, 51; Ex. 1003 ¶ 180).

In its Response, Patent Owner contends that Katayama does not teach a short term memory updated at a different rate than long term memory “because there are not two different memories as required by the claims; rather, there is one memory wherein different data is categorized differently.” PO Sur-reply 28 (citing Ex. 1024 ¶¶ 44–46, 51; Ex. 2001 ¶¶ 158–162).

Based on our review of the complete record, we agree with Petitioner's position. *See* Pet. 47. As discussed, we determine that Katayama teaches both short term memory at section 802 and long term memory at section 803. Katayama further teaches that “[t]he data receiving section 801 receives the situation data as being data concerning the behavior . . . at a constant sampling time one after another in a chronological order and writes the received situation data one after another in the temporary data storage section 802.” Ex. 1024 ¶ 45. Katayama expressly teaches that situation data is moved from storage section 802 to section 803 “[o]nly in case that the content meets the predetermined condition[.]” *Id.* ¶ 46. We find this disclosure supports Petitioner's position that storage section 802 receives the data at a constant sampling rate that is a higher update rate than the long term memory, storage section 803, because only a selection of the

temporary data is transferred over after meeting a predetermined condition(s). *See* Pet. 47.

Based on the entire record, Petitioner has explained sufficiently with reference to Curry, Rabu, and Katayama, how the asserted combination teaches or suggests limitation [1.11].

f. write driving information to the short term memory at a predetermined update rate during the driving period in a predetermined sequence [1.12]

Claim 1 also requires that the mobile telecommunications device is configured to “write driving information to the short term memory at a predetermined update rate during the driving period in a predetermined sequence.” Ex. 1001, 32:5–7.

For this limitation, Petitioner asserts that Katayama’s data receiving section 801 receives “situation data” including sensor data at a constant sampling time one after another (e.g., predetermined update rate) in a chronological order (e.g., predetermined sequence) and writes the received situation data in memory 82’s temporary data storage section 802. Pet. 20–21 (citing Ex. 1024 ¶ 16, 45; Ex. 1003 ¶ 75); *id.* at 49 (citing Ex. 1024 ¶¶ 44–46, Fig. 5; Ex. 1003 ¶ 185).

Patent Owner does not provide any arguments specific to this limitation beyond those discussed above. PO Resp. 45.

Based on our review of the complete record, we agree with and adopt as our own Petitioner’s arguments. *See* Pet. 49.

g. overwrite the driving information previously written to the short term memory in accordance with the predetermined sequence [1.13]

Claim 1 also requires that the mobile telecommunications device is configured to “overwrite the driving information previously written to the short term memory in accordance with the predetermined sequence.”

Ex. 1001, 32:8–10.

For this limitation, Petitioner relies on the testimony of Dr. Michalson, who testifies Katayama teaches that

“[i]f a capacity of the [short term memory section] . . . runs out, old data is sequentially erased and new situation data is written in” to the short term memory section. USAA-1024, [0045]. A POSITA would have understood that, being “*sequentially* erased,” the old data is erased according to the chronological order in which it was written into the short term memory section, which is First in, First Out (“FIFO”), a typical replacement policy commonly used to overwrite old data in a memory when the memory is full.

Ex. 1003 ¶ 188 (citing Ex. 1027, 70–71; Ex. 1039 ¶¶ 3–4); Pet. 50.

Patent Owner does not provide any arguments specific to this limitation beyond those discussed above. PO Resp. 45.

Based on our review of the complete record, we agree with and adopt as our own Petitioner’s arguments. *See* Pet. 50.

h. Conclusion

We have reviewed the parties’ contentions and evidence, and conclude that Petitioner has established by a preponderance of evidence that claim 1 is unpatentable over the asserted combination of Curry, Rabu, and Katayama.

2. *Claims 2–4, 6, 9–12, 16–24, and 26*

For independent claim 26, Petitioner relies on the same or similar arguments and evidence discussed above for the combination of Curry, Rabu, and Katayama. *See* Pet. 51 (“The combination renders this claim obvious in the same manner as explained above for the corresponding claim 1 limitations listed in the table below.”) (citing Ex. 1003 ¶ 215). Claims 2–4, 6, 9–12, and 16–24 depend from independent claim 1. We have also reviewed Petitioner’s contentions for the challenges to these claims. *See* Pet. 52–67.

Patent Owner does not address these claims separately but relies on the same arguments provided for claim 1. PO Resp. 60 (“Claims 2–4, 6, 9–12, and 16–24 ultimately depend from Claim 1 and incorporate the same limitations therein. Thus, for the same reasons as are set forth above for Claim 1, Claims 2–4, 6, 9–12, and 16–24 are patentable over the proposed combination. . . . Claim 26 recites substantially similar features as for Claim 1. Thus, for the same reasons as are set forth above for Claim 1, Claim 26 is patentable over the proposed combination.”).

Accordingly, based on the reasoning and evidence provided in the Petition (*see* Pet. 51–67), we determine that Petitioner has shown by a preponderance of evidence that claims 2–4, 6, 9–12, 16–24, and 26 would have been obvious based on the combined teachings of Curry, Rabu, and Katayama.

G. *Obviousness Based on Curry, Rabu,
Katayama, and Tamir*

Petitioner asserts that dependent claim 5 of the ’369 patent would have been obvious over Curry, Rabu, Katayama, and Tamir. Pet. 67–68.

Patent Owner does not address this claim separately but relies on the same arguments provided for claim 1. PO Resp. 60 (“Claim 5 ultimately depends from Claim 1 and incorporates the same limitations therein. Thus, for the same reasons as are set forth above, Claim 5 is patentable over the proposed combination. The addition of Tamir does not cure these shortcomings.”).

Accordingly, based on the reasoning and evidence provided in the Petition (*see* Pet. 67–68), which we adopt as our own, we determine that Petitioner has shown by a preponderance of evidence that claim 5 would have been obvious based on the combined teachings of Curry, Rabu, Katayama, and Tamir.

*H. Obviousness Based on
Curry, Rabu, Katayama, and Balachandran*

Petitioner asserts that each of dependent claims 7, 8, and 15 of the ’369 patent would have been obvious over Curry, Rabu, Katayama, and Balachandran. Pet. 69–73.

Patent Owner does not address these claims separately but relies on the same arguments provided for claim 1. PO Resp. 60–61 (“Claims 7, 8, and 15 ultimately depend from Claim 1 and incorporate the same limitations therein. Thus, for the same reasons as are set forth above, Claims 7, 8, and 15 are patentable over the proposed combination. The addition of Balachandran does not cure these shortcomings.”).

Accordingly, based on the reasoning and evidence provided in the Petition (*see* Pet. 69–73), which we adopt as our own, we determine that Petitioner has shown by a preponderance of evidence that claims 7, 8, and 15

would have been obvious based on the combined teachings of Curry, Rabu, Katayama, and Balachandran.

*I. Obviousness Based on
Curry, Rabu, Katayama, and Thompson2010*

Petitioner asserts that each of claim 13 and 14 of the '369 patent would have been obvious over Curry, Rabu, Katayama, and Thompson2010. Pet. 73–78.

Claim 13 depends from independent claim 1 and dependent claim 2. Ex. 1001, 32:66–33:4. Claim 13 further recites “wherein the device is controlled by the downloaded application to detect the occurrence of a predetermined event of significance, such as a crash, and in response to store driving information associated with that event to the memory.” *Id.*

Claim 14 depends from independent claim 1 and dependent claim 2. Ex. 1001, 33:5–11. Claim 14 further recites “wherein the device is controlled by the downloaded application to detect the occurrence of a predetermined event of significance, such as a crash, and in response to transmit driving information associated with that event via the wireless telecommunication module to a remote data-logging system.” *Id.*

1. Petitioner’s Contentions

For claims 13 and 14, Petitioner acknowledges that “Curry contemplates emergency scenarios (e.g., accidents) may occur, [but] it does not disclose specific embodiments focused on detecting an emergency or actions performed by phone 106 in response to a detected emergency.” Pet. 75 (citing Ex. 1005, 4:16–28, 10:16–26, cl. 9). Petitioner asserts, however, Curry provides broader motivation towards “programs and initiatives to reduce traffic-related fatalities and injuries.” *Id.* (citing Ex. 1005, 2:9–21).

With regard to Thompson2010, Petitioner contends that Thompson2010's system employs a client-server architecture, "WreckWatch," in which "sensors built into a smartphone detect a major acceleration event indicative of an accident and utilize the built-in 3G data connection to transmit that information to a central server." Pet. 74 (quoting Ex. 1008, 30). Petitioner contends that the server processes the information and notifies authorities and emergency contacts. *Id.* (citing Ex. 1008, 30; Ex. 1003 ¶ 83).

Petitioner further asserts that "a POSITA would have configured [Curry's] phone 106 to perform Thompson2010's accident detection technique and thereby detect traffic accidents." Pet. 76–77 (citing Ex. 1008, 30; Ex. 1003 ¶ 236). Petitioner adds that "[a] POSITA would have understood and/or found obvious that, in the combination . . . , [Curry's] motion data cache stores sensor information that is processed by phone 106 (using Thompson2010's accident detection technique) to identify a traffic accident ('store driving information associated with that event to the memory')." *Id.* at 77 (citing Ex. 1005, 2:24–5:6; Ex. 1003 ¶ 237). For claim 14, Petitioner adds that Thompson2010's Wreck-Watch uploads, e.g., transmits, data associated with a detected accident ("driving information associated with that event") to an associated server. *Id.* (citing Ex. 1008, 30).

2. Patent Owner's Contentions

Patent Owner contends that "Thompson2010 is a rudimentary experimental study limited to significant crashes that filters out and/or ignores certain sensor data that the '369 patent would depend on for event detection." PO Resp. 61 (citing Ex. 2001 ¶¶ 163–164). Patent Owner

argues that “[t]he limitations of Thompson2010’s acceleration measurements would not provide the range needed by the ’369 patent for detecting accidents by the mobile telecommunications device.” *Id.* at 64. Because of these shortcomings, Patent Owner contends a POSITA would not have combined Thompson2010’s teachings with Curry. *Id.*

3. Discussion

Thompson2010 describes the use of “smartphones to detect car accidents and provide situational awareness to emergency responders.” Ex. 1008, 1 (capitalization and emphasis of heading altered). Thompson2010 discloses the WreckWatch client-server architecture is separated into the WreckWatch server and WreckWatch client. *Id.* at 4. Thompson2010 further teaches that “[t]he WreckWatch client acts as a mobile sensor, relays accident information to the server, and provides an interface for third-party observers to contribute information to the accident report.” *Id.* (emphasis omitted). Thompson2010 further teaches that

WreckWatch uses Android’s onboard sensors to detect the forces and accelerations associated with a car accident, as shown in Figure 6. The Android platform provides an orientation sensor comprised of three independent accelerometers that allow WreckWatch to detect car accidents. . . . In the event of an accident, the smartphone will experience the same forces and accelerations experienced by the occupants of the vehicle. Moreover, *if the smartphone remains stationary relative to the vehicle during the collision, it is possible to use the data gathered from the smartphone to recreate and model the forces it experienced. In this case, the smartphone can provide data much like that gathered by vehicular ECUs [electronic control units].*

Id. at 7 (emphases added).

Here, we observe that Thompson2010 expressly teaches WreckWatch may detect car accidents, e.g., crashes, while inside the vehicle. Moreover,

Thompson2010 discloses that WreckWatch employs sensor-based and context filters to eliminate false-positives. Ex. 1008, 8. In this way, we understand WreckWatch to detect *predetermined events of significance* by, for example, ignoring any acceleration events below 4G's. *Id.*

Patent Owner contends that WreckWatch ignores sensor data that the '369 patent would consider for event detection. PO Resp. 64 ("The limitations of Thompson2010's acceleration measurements would not provide the range needed by the '369 patent for detecting accidents by the mobile telecommunications device. Thus, a POSITA thus likely would not have looked to combine Thompson2010 with Curry-Rabu-Katayama to arrive at the subject matter of claims 13 and 14."); Ex. 2001 ¶ 170.

However, neither claim 13 or claim 14 expressly recites or requires a sensor data range or specific predetermined events. Instead, claims 13 and 14 recite "wherein the device is controlled by the downloaded application to detect the occurrence of a predetermined event of significance, *such as a crash*["]. Ex. 1001, 32:66–33:11 (emphasis added). WreckWatch teaches exactly that—detection of car accidents when acceleration events are above 4G's. Ex. 1008, 8. Mr. Wilson acknowledges that "a POSITA may have gained some direction from Thompson2010," but asserts that "the direction would have been severely limited due to Thompson2010's experimental shortcomings." Ex. 2001 ¶ 170. Nonetheless, even assuming some trade-offs must be made, Mr. Wilson does not explain how these limitations detract from Thompson2010's express teaching that the WreckWatch client on a mobile phone detects predetermined events of significance, such as a car accident/crash. That being so, the record better supports Petitioner's arguments.

We determine that Petitioner has shown by a preponderance of evidence that claim 13 and claim 14 would have been obvious based on the combined teachings of Curry, Rabu, Katayama, and Thompson2010.

*J. Obviousness Based on
Curry, Rabu, Katayama, and Willis*

Petitioner asserts that dependent claim 25 of the '369 patent would have been obvious over Curry, Rabu, Katayama, and Willis. Pet. 78–80.

Patent Owner does not address this claim separately but relies on the same arguments provided for claim 1. PO Resp. 64 (“Claim 25 ultimately depends from Claim 1 and incorporates the same limitations therein. Thus, for the same reasons as are set forth above, Claim 25 is patentable over the proposed combination. The addition of Willis does not cure these shortcomings.”).

Accordingly, based on the reasoning and evidence provided in the Petition (*see* Pet. 78–80), which we adopt as our own, we determine that Petitioner has shown by a preponderance of evidence that claim 25 would have been obvious based on the combined teachings of Curry, Rabu, Katayama, and Willis.

*K. Obviousness Based on
Curry, Rabu, Katayama, and Berkobin*

Petitioner asserts that independent claim 27 of the '369 patent would have been obvious over Curry, Rabu, Katayama, and Berkobin. Pet. 80–82. Petitioner relies on the same or similar arguments and evidence discussed above for the combination of Curry, Rabu, and Katayama. *See* Pet. 80–82. Petitioner further relies on Berkobin’s disclosure of artificial intelligence,

neural networks, and iterative learning in combination with Curry, Rabu, and Katayama. *Id.* at 80. According to Petitioner, “a POSITA would have configured [Curry] phone 106 to use a neural network to determine whether recorded motion data indicates a safe driving behavior or an unsafe driving behavior.” *Id.* at 82 (citing Ex. 1005, 2:24–3:11, 6:5–22, 8:31–9:12; Ex. 1003 ¶ 248).

For claim 27, Patent Owner relies on arguments made for claims 1 and 26. PO Resp. 64. Patent Owner adds that Berkobin is another “black-box like” device integrated with a vehicle’s sensors, and therefore suffers from similar shortcomings as Katayama. *Id.* at 65. Patent Owner further contends that

Berkobin thus does not disclose or even contemplate any processing on a mobile phone as claimed. AT-2001, ¶¶173-174. Berkobin only generically suggests that its non-phone apparatus “can employ Artificial Intelligence techniques such as [a number of generic examples including a neural network].” *See*, USAA-1010, [0031]. Berkobin does not indicate how such AI functionality might be integrated into its apparatus for any purpose, much less for the purposes identified in Claim 27. AT-2001, ¶175.

Id. at 65.

Based on the complete record, Petitioner’s position is the more persuasive. Claim 27 recites that the mobile telecommunications device is configured to:

process the sensor data from the sensor set during the driving period to derive driving information associated with how the vehicle is driven; *the processing involving the use of a neural network on the mobile telecommunications device to determine whether the driving information represents an acceptable or unacceptable driving pattern.*

Ex. 1001, 34:47–53 (emphases added). To Petitioner’s and Dr. Michalson’s point, the ’369 patent describes only that the “use of virtual neural networks can be used to determine whether the driving information represents acceptable or unacceptable driving patterns.” Pet. 82 (citing Ex. 1001, 7:1–7:3). Nonetheless, we understand that the express language of claim 27 requires that the mobile telecommunications device is configured to perform the recited processing. Here, Patent Owner does not dispute that Berkobin discloses a “neural network” in the form of, for example, Artificial Intelligence functionality. *See* PO Resp. 64–67. Rather, Patent Owner contends that Berkobin’s “black-box like” device and accompanying description does not teach or suggest how a mobile phone would perform the processing. *Id.* As discussed, however, we agree with Petitioner that Curry teaches a mobile telecommunication device may process sensor data to derive driving information associated with how the vehicle is being driven. *See supra* Sect. II.F.1. Moreover, Berkobin expressly teaches that

[t]he methods and systems can employ Artificial Intelligence techniques such as machine learning and iterative learning. *Examples of such techniques include, but are not limited to, expert systems, case based reasoning, Bayesian networks, behavior based AI, neural networks, fuzzy systems, evolutionary computation (e.g. genetic algorithms), swarm intelligence (e.g. ant algorithms), and hybrid intelligent systems (e.g. Expert inference rules generated through a neural network or production rules from statistical learning).*

Ex. 1010 ¶ 31 (emphases added). With this guidance, we find that Dr. Michalson’s testimony is better supported by the disclosure of both Curry and Berkobin. More specifically, based on disclosures in Curry and Berkobin, we agree with Dr. Michalson that Berkobin describes how a neural network can be used to process sensor data, a POSITA would have

understood that Curry's phone 106 processes recorded motion data, and a POSITA would have been motivated to employ a neural network (as suggested by Berkobin) to process that data. *See* Ex. 1003 ¶ 248.

Accordingly, based on the reasoning and evidence provided in the Petition (*see* Pet. 80–82), we determine that Petitioner has shown by a preponderance of evidence that claim 27 would have been obvious based on the combined teachings of Curry, Rabu, Katayama, and Berkobin.

II. CONCLUSION¹⁵

In summary, we determine that a preponderance of the evidence establishes that claims 1–27 of the '369 patent are unpatentable. That determination is shown in the following table:

¹⁵ Should Patent Owner wish to amend the challenged claims in a reissue or reexamination proceeding, we draw Patent Owner's attention to the *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. *See* 84 Fed. Reg. 16654 (Apr. 22, 2019). If Patent Owner files a reissue application or request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

Claim(s)	35 U.S.C. §	Reference(s)/B asis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–4, 6, 9–12, 16–24, 26	103(a)	Curry, Rabu, Katayama	1–4, 6, 9–12, 16–24, 26	
5	103(a)	Curry, Rabu, Katayama, Tamir	5	
7, 8, 15	103(a)	Curry, Rabu, Katayama, Balachandran	7, 8, 15	
13, 14	103(a)	Curry, Rabu, Katayama, Thompson2010	13, 14	
25	103(a)	Curry, Rabu, Katayama, Willis	25	
27	103(a)	Curry, Rabu, Katayama, Berkobin	27	
Overall Outcome			1–27	

III. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–27 of the '369 patent have been shown to be unpatentable; and

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

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