

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Andrew William Wright
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Title: METHOD AND SYSTEM FOR LOGGING VEHICLE BEHAV-
IOR

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PETITION FOR *INTER PARTES* REVIEW OF
UNITED STATES PATENT NO. 9,633,487

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EXHIBITS

USAA-1001	U.S. Patent No. 9,633,487 to Wright (“the ’487 Patent”)
USAA-1002	Excerpts from the Prosecution History of the ’487 Patent (“the Prosecution History”)
USAA-1003	Declaration and Curriculum Vitae of Dr. William Michalson
USAA-1004	Original Complaint for Patent Infringement in <i>Auto Telematics Ltd. v. United Services Automobile Association</i> , 6:22-cv-00474 (W.D. Tex. May 11, 2022)
USAA-1005	International Publication No. WO 2010/042545 to Curry et al. (“Curry”)
USAA-1006	U.S. Patent No. 7,821,421 to Tamir et al. (“Tamir”)
USAA-1007	U.S. Patent No. 6,073,004 to Balachandran (“Balachandran”)
USAA-1008	Thompson et al., “Using Smartphones and Wireless Mobile Sensor Networks to Detect Car Accidents and Provide Situational Awareness to Emergency Responders,” <i>Mobilware 2010</i> , LNICST 48, pp. 29–42, 2010 (“Thompson2010”)
USAA-1009	International Publication No. WO 2007/114716 (“Willis”)
USAA-1010	U.S. Patent Application Publication No. 2008/0255888 (“Berkobin”)
USAA-1011	Cheng et al., “An Android System Design and Implementation for Telematics Services,” 2010 IEEE International Conference on Intelligent Computing and Intelligent Systems. Vol. 2. IEEE, 2010 (“Cheng2010”)
USAA-1012	U.S. Pat. No. 8,290,480 to Abramson (“Abramson”)
USAA-1013	U.S. Pat. No. 8,682,399 to Rabu (“Rabu”)

USAA-1014	U.S. Pat. App. Pub. No. 2010/0208070 to Haynes (“Haynes”)
USAA-1015	U.S. Pat. App. Pub. No. 2002/0105423 to Rast (“Rast”)
USAA-1016	U.S. Pat. App. Pub. No. 2009/0192705 to Golding (“Golding”)
USAA-1017	U.S. Pat. No. 7,765,058 to Doering (“Doering”)
USAA-1018	European Pat. Pub. No. EP1614585A1 to Christian (“Christian”)
USAA-1019	U.S. Pat. No. 5,906,393 to Mazur (“Mazur”)
USAA-1020	Richard C. Hunt, “Emerging Communication Technologies in Emergency Medical Services,” Prehospital Emergency Care, 2002; 6: 131-136 (“Hunt2002”)
USAA-1021	Kanianthra, Joseph, Arthur Carter, and Gerard Preziotti, “Enhancing post-crash vehicle safety through an automatic collision notification system,” No. 2001-06-0085. SAE Technical Paper, 2001 (“Kanianthra2001”)
USAA-1022	Megalingam R.K. et al., “Wireless vehicular accident detection and reporting system.” 2010 International Conference on Mechanical and Electrical Technology. CMET, 2010 (“Megalingam2010”)
USAA-1023	Farris, P. et al., “General Motors OnStar.” Darden Case No. UVA-M-0659 (2002) (“Farris2002”)
USAA-1024	European Pat. App. Pub. No. EP 1,914,691 to Katayama et al. (“Katayama”)
USAA-1025	U.S. Pat. App. Pub. No. 2012/0074770 to Lee (“Lee”)
USAA-1026	RESERVED
USAA-1027	Linda Null & Julia Lobur, “The Essentials of Computer

Organization and Architecture” (2d ed. 2003) (“Null2003”)

USAA-1028	U.S. Pat. Publication No. 2009/0005975 to Forstall et al. (“Forstall”)
USAA-1029	Langle, Lonnie, and Ram Dantu, “Are you a safe driver?” 2009 International Conference on Computational Science and Engineering. Vol. 2. IEEE, 2009 (“Langle2009”)
USAA-1030	U.S. Pat. Publication No. 2006/0053038 to Warren et al. (“Warren”)
USAA-1031	U.S. Pat. Publication No. 2007/0027585 to Wulff (“Wulff”)
USAA-1032	Mohan, Prashanth et al., “Nericell: rich monitoring of road and traffic conditions using mobile smartphones,” Proceedings of the 6th ACM conference on Embedded network sensor systems, 2008 (“Mohan2008”)
USAA-1033	U.S. Pat. No. 5,274,560 to LaRue (“LaRue”)
USAA-1034	Declaration of Nathaniel E. Frank-White re Exhibits USAA-1077 (Ex. A) and USAA-1078 (Ex. B)
USAA-1035	RESERVED
USAA-1036	Declaration of Nathaniel E. Frank-White re Exhibits USAA-1079 (Ex. A), USAA-1080 (Ex. B), and USAA-1081 (Ex. C)
USAA-1037-1040	RESERVED
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USAA-1042	Del Rosso, Christian, “The method, the tools and rationales for assessing dynamic memory efficiency in embedded real-time systems in practice,” 2006 International Conference on Software Engineering Advances (ICSEA'06), IEEE, 2006

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- USAA-1045 International Publication No. WO 2010/06899 (“Callopy”)
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- USAA-1047 Conover, Gerald D. “ITS Technology in Automotive—Who's on First?” *SAE International* (2006): 1-11 (“Conover2006”)
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- USAA-1052 Reddy, Sasank et al., “Determining transportation mode on

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- USAA-1053 Zhao, Yilin, “Standardization of mobile phone positioning for 3G systems,” IEEE Communications magazine 40.7 (2002): 108-116 (“Zhao2002B”)
- USAA-1054 Strömmer, Esko et al., “Ultra-low power sensors with near field communication for mobile applications,” Wireless Sensor and Actor Networks: IFIP WG 6.8 First International Conference on Wireless Sensor and Actor Networks, WSAAN’07, Albacete, Spain, September 24–26, 2007. Springer US, 2007 (“Strömmer2007”)
- USAA-1055 Schott, Christian, et al., “CMOS single-chip electronic compass with microcontroller,” IEEE Journal of Solid-State Circuits 42.12 (2007): 2923-2933 (“Schott2007”)
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- USAA-1057 Ealey, Lance & Luis Troyano-Bermúdez, “Are automobiles the next commodity?” The McKinsey Quarterly 4 (1996): 62 (“Ealey1996”)
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- USAA-1059 Young, Richard A., “Association between embedded cellular phone calls and vehicle crashes involving airbag deployment,” Proceedings of the First International Driving Symposium on Human Factors in Driver Assessment, Training and Vehicle Design, Vol. 1. No. 2001, University of Iowa, 2001 (“Young2001”)
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- USAA-1062 Kerner, B. S., et al., “Traffic state detection with floating car data in road networks,” Proceedings of the 8th International IEEE Conference on Intelligent Transportation Systems, 2005 (“Kerner2005”)
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- USAA-1064 Troncoso, Carmela, et al, “Pripayd: privacy friendly pay-as-you-drive insurance,” IEEE Transactions on Dependable and Secure Computing, Vol. 8, No. 5, October 2011 (“Troncoso2011”)
- USAA-1065 Memorandum, Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation (USPTO June 21, 2022) (“Director’s Guidance”)
- USAA-1066 Order Granting Motion for Entry of Scheduling Order in *Auto Telematics Ltd. v. United Services Automobile Association*, 6:22-cv-00474 (W.D. Tex. September 16, 2022)
- USAA-1067 U.S. District Court Statistics (June 30, 2022), *available at* https://www.uscourts.gov/sites/default/files/fcms_na_distprofile_0630.2022_0.pdf
- USAA-1068 USAA’s Opening Claim Construction Brief in *Auto Telematics Ltd. v. United Services Automobile Association*, 6:22-cv-00474 (W.D. Tex. December 19, 2022)
- USAA-1069 Plaintiff’s Claim Construction Response Brief in *Auto Telematics Ltd. v. United Services Automobile Association*, 6:22-cv-00474 (W.D. Tex. January 12, 2023)

USAA-1070	USAA’s Reply Claim Construction Brief in <i>Auto Telematics Ltd. v. United Services Automobile Association</i> , 6:22-cv-00474 (W.D. Tex. January 25, 2023)
USAA-1071	Plaintiff’s Claim Construction Sur-Reply Brief in <i>Auto Telematics Ltd. v. United Services Automobile Association</i> , 6:22-cv-00474 (W.D. Tex. February 6, 2023)
USAA-1072	Joint Claim Construction Statement in <i>Auto Telematics Ltd. v. United Services Automobile Association</i> , 6:22-cv-00474 (W.D. Tex. February 7, 2023)
USAA-1073	Claim Construction Order in <i>Auto Telematics Ltd. v. United Services Automobile Association</i> , 6:22-cv-00474 (W.D. Tex. February 17, 2023)
USAA-1074	Stipulation by USAA
USAA-1075	Plaintiff Auto Telematics Ltd.’s Preliminary Infringement Contentions and Identification of Document Production Accompanying Disclosure in <i>Auto Telematics Ltd. v. United Services Automobile Association</i> , 6:22-cv-00474 (W.D. Tex. August 26, 2022)
USAA-1076	United Services Automobile Association’s Preliminary Invalidity Contentions in <i>Auto Telematics Ltd. v. United Services Automobile Association</i> , 6:22-cv-00474 (W.D. Tex. October 21, 2022)
USAA-1077	Internet Archive of Waze User Manual
USAA-1078	Internet Archive of iPhone User Guide
USAA-1079	Internet Archive of iPhone 3G Technical Specification
USAA-1080	Internet Archive of iPhone User Guide for iPhone and iPhone 3G
USAA-1081	Internet Archive of Instruction Sheet for iPhone 3G

LISTING OF CHALLENGED CLAIMS

Claim	Identifier	Claim Language
1	[1.1]	A mobile telecommunications device configured to log driving information associated with a vehicle,
	[1.2]	the mobile telecommunications device comprising: 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]	the mobile telecommunications device configured to: determine, based on 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;
	[1.8]	store a selection of the driving information to the memory;
	[1.9]	wherein the driving information is derived without data from vehicle sensors, and
	[1.10]	the mobile telecommunications device is controlled by a downloaded application to control the mobile device to detect occurrence of a predetermined event and in response take at least one predetermined action.
2	[2]	The mobile telecommunication device according to claim 1, wherein the predetermined action is storing driving information associated with that event to the memory.
3	[3.1]	The mobile telecommunications device according to claim 1, wherein the predetermined action comprises

Claim	Identifier	Claim Language
		providing feedback to a user to indicate that an event has been detected,
	[3.2]	the mobile telecommunications device being configured to receive a user interaction to confirm or deny whether the detected event has actually occurred following said feedback.
4	[4.1]	The mobile telecommunications device according to claim 3, wherein the feedback comprises notifying a user that a further action has been scheduled, and will be taken within a predetermined period,
	[4.2]	the mobile telecommunications device being further configured to receive a user interaction to confirm or deny whether the further scheduled action should be taken within a predetermined period.
5	[5.1]	A mobile telecommunications device according to claim 1, wherein the predetermined action comprises communicating to a remote system that an event has been detected,
	[5.2]	the mobile telecommunications device being further configured to receive from the remote system a request to transmit to the remote system selected portions of the driving information associated with the detected event.
6	[6.1]	The mobile telecommunications device according to claim 1, wherein the memory comprises: a long term memory for persistently storing driving information and a short term memory for transiently storing driving information,
	[6.2]	wherein the short term memory receives driving information at a higher update rate than the long term memory,
	[6.3]	the mobile telecommunications device being further configured to: write driving information to the short term memory at a predetermined update rate during the driving period in a predetermined sequence; and,

Claim	Identifier	Claim Language
	[6.4]	overwrite the driving information previously written to the short term memory in accordance with the predetermined sequence.
7	[7.1]	The mobile telecommunications device according to claim 6, wherein the mobile communications device is controlled by the downloaded application to control the mobile device to detect an occurrence of a predetermined event and
	[7.2]	in response transfer data from the short term memory to the long term memory.
8	[8.1]	The mobile telecommunications device according to claim 1, further configured to: interface with an external device, the external device having access to external driving information associated with a condition of the vehicle; and,
	[8.2]	to receive at least a portion of the external driving information from the external device.
9	[9.0]	The mobile telecommunications device according to claim 1, wherein the mobile communications device is controlled by the downloaded application to control the mobile device to process the driving information to generate a driving score associated with a particular driver.
10	[10.0]	The mobile telecommunication device according to claim 1, wherein the predetermined action is storing driving information captured at a higher sampling rate than when an event is not detected.
11	[11]	The mobile telecommunication device according to claim 1, wherein the predetermined action is transmitting driving information via a wireless telecommunication module of the mobile telecommunication device to a remote system.
12	[12]	The mobile telecommunication device according to claim 11, wherein the mobile telecommunications device utilizes its own power supply.

Claim	Identifier	Claim Language
13	[13]	The mobile telecommunication device according to claim 11, wherein the mobile telecommunications device is a smartphone.

United Services Automobile Association (“Petitioner” or “USAA”) petitions for *Inter Partes* Review (“IPR”) of claims 1-13 (“Challenged Claims”) of U.S. Patent No. 9,633,487 (“the ’487 Patent”).

I. REQUIREMENTS

A. Grounds for Standing

USAA certifies that the ’487 Patent is available for IPR. USAA is not barred or estopped from requesting this review challenging the Challenged Claims on the below-identified grounds. USAA was served with a complaint of infringement of the ’487 Patent less than one year ago. USAA-1004.

B. Challenge and Relief Requested

USAA requests IPR and cancellation of the Challenged Claims on the grounds below. A declaration from Dr. William Michalson¹ (USAA-1003) is furnished herewith.

Ground	Claims	Basis
1A	1, 2, 5, 9, 11-13	§103: Curry, Rabu
1B	3, 4	§103: Curry, Rabu, Balachandran
1C	6-8	§103: Curry, Rabu, Katayama
1D	10	§103: Curry, Rabu, Tamir
2A	1, 2, 12, 13	§103: Forstall, Rabu, Langle2009

¹ Dr. Michalson is a professor in Robotics Engineering at the Worcester Polytechnic Institute.

Ground	Claims	Basis
2B	3, 4	§103: Forstall, Rabu, Langle2009, Balachandran
2C	6-8	§103: Forstall, Rabu, Langle2009, Katayama
2D	5, 9, 11	§103: Forstall, Rabu, Langle2009, Warren
2E	10	§103: Forstall, Rabu, Langle2009, Tamir

The '487 patent was filed 3/4/2016 and claims priority, via several applications, to GB Pat. App. No. 1021292.6 filed 12/15/2010 ("Critical Date"). USAA does not concede that the Challenged Claims are entitled to the claimed priority, but applies prior art before that date. USAA-1003, ¶¶13-15, 26-29; USAA-1075, 8-9. Applied references are prior art as below:

Reference	Date(s)	Basis
Curry	4/15/2010	§102(a)
Forstall	1/1/2009	§102(b)
Rabu	12/15/2009	§102(e)
Langle2009	8/31/2009	§102(b)
Warren	3/9/2006	§102(b)
Tamir	2/1/2007 10/26/2010	§102(b) §102(a)
Balachandran	6/6/2000	§102(b)
Katayama	4/23/2008	§102(b)

C. Claim Construction

Because the Challenged Claims are obvious under any reasonable interpretation, no express constructions are required in this proceeding. *See Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011); USAA-1068-1073.

As discussed in §III.A.2, *infra*, claim 1 recites:

the mobile telecommunications device configured to: determine, based on 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;

Based on plain meaning, the recited “driving period” references a time period “during which [a] mobile device is removably attached to the vehicle and the vehicle is in use.” Though the namesake of the “driving period” suggests driving, because the two claim parameters defining the “driving period” are “removably attached...*and* the vehicle is in use,” the claim leaves open the possibility of the driving period corresponding to the beginning, middle or end of, a vehicle’s operation. USAA-1003, ¶130. The ’487 patent specification is similarly unbounded, as it expressly recognizes several driving period options that are untethered from, e.g., the beginning of the user driving the vehicle: “the mobile device [] register[s] the start of a driving period in response to an initialisation input,” which may be “the

user manually executing the application on the mobile device[,]” “the mobile device being installed to the vehicle and/or the vehicle being driven.” USAA-1001, 3:31-61; USAA-1003, ¶131.

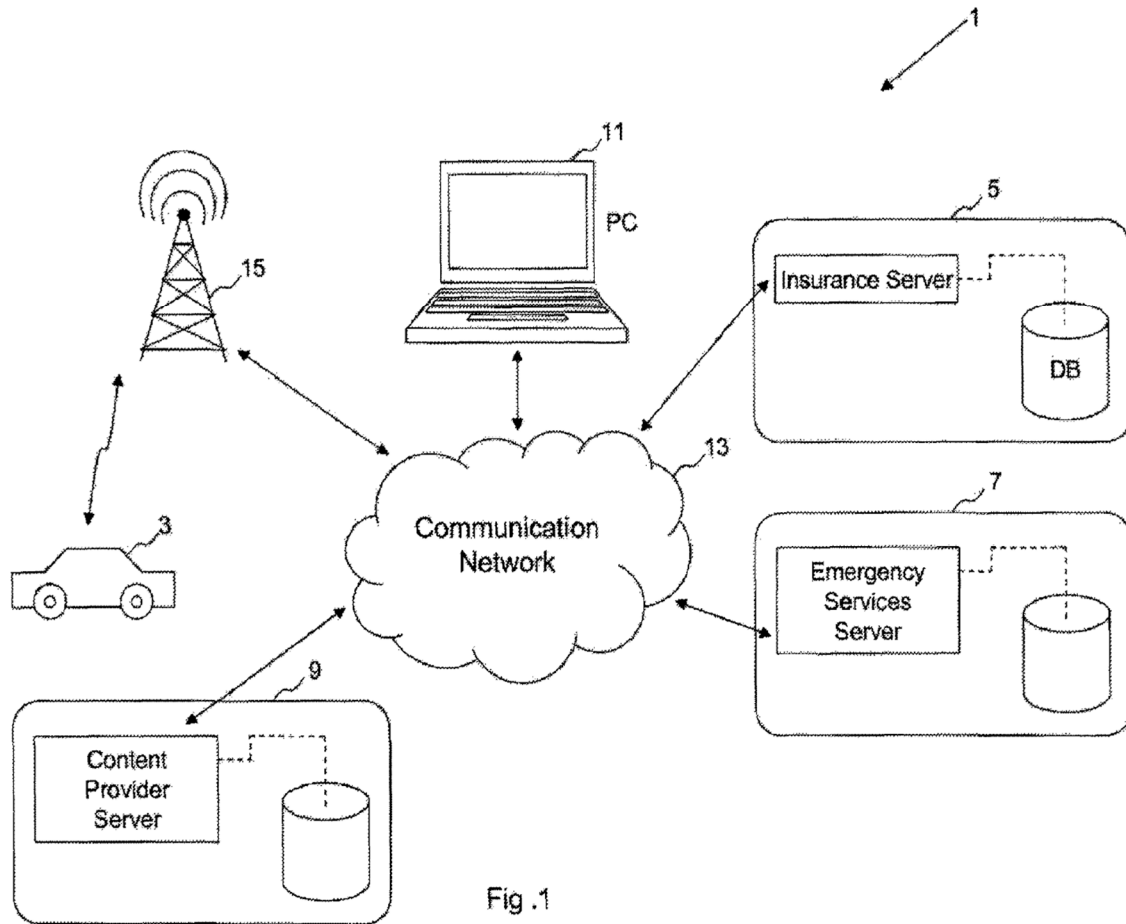
Thus, this claim term establishes just two “driving period” attributes: (1) “the mobile device is removably attached to the vehicle” and (2) “the vehicle is in use.” USAA-1003, ¶132. These attributes may be satisfied by a start of a monitoring period, whether at the onset of vehicle driving or whether instead before or thereafter. *Id.*

II. THE ’487 PATENT

A. Specification

The ’487 patent is directed to “logging driving information....” USAA-1001, Abstract. A mobile device installed in the vehicle logs information can “determine the cause of an accident,” “modify driver behavior,” or “determine insurance premiums.” *Id.*, 1:19-27; USAA-1003, ¶55. These techniques were conventional by the Critical Date. *See* USAA-1003, ¶¶30-54 (technology overview). Even the ’487 patent acknowledges that “data logging devices that can be retrofitted to road conditions” are “known in the art.” *Id.*, 1:46-55.

Figure 1 shows a system 1 placed in automobile 3:



USAA-1001, Fig. 1

System 1 includes a mobile device configured to “monitor and process sensor data” to “derive driving information,” for example, to monitor “a driver’s driving performance.” *Id.*, 13:33-53; 13:15-32; USAA-1003, ¶¶56-59.

B. Prosecution History

During prosecution, the examiner rejected claims over U.S. Pub. Nos. 2007/0135979 (“Plante”), 2005/0046584 (“Breed”), and 2008/0255722 (“McClellan”). USAA-1002, 40-50. Features to which arguments were directed in distinguishing this art (and all other record prior art) during prosecution are

addressed in a fresh way by combinations proposed in this petition that leverage

Curry, Rabu, Balachandran, Katayama, Tamir, Forstall, Langle2009, and Warren,

none of which were cited in prosecution. USAA-1003, ¶¶60-65.

III. THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. [GROUND 1A] – Curry-Rabu Renders Claims 1, 2, 5, 9, and 11-13 Obvious

1. Proposed Combination

(a) *Curry*

Curry describes using a “mobile wireless computing device” with embedded accelerometers and/or positioning sensors (e.g., an “iPhone 3G smart phone[]”) to “detect and prevent unsafe driving behavior[s]”, and generate related “driving safety...score[s]” for determining insurance premiums. USAA-1005, Abstract, 2:1-27, 3:24-4:6, 4:7-11, 7:5-22, 9:31-33, Fig. 1; USAA-1003, ¶¶67.

Figure 1 (below) shows a driving safety data server 104 in communication with a “mobile phone” that in a vehicle. USAA-1005, 7:23-29, 8:21-27. The phone runs a downloadable client 110 to monitor vehicle movement (e.g., evaluating “location, speed, and acceleration data” from an embedded “GPS sensor 114 and accelerometer 116”). *Id.*, 8:30-34. Client 110 also identifies phone usage (e.g., texting/calling while driving) and other risky driving behaviors (e.g., “speeding, abnormal acceleration, abnormal deceleration, and taking sharp turns”). USAA-1005, 7:5-22, 9:5-11, 8:30-9:33; USAA-1003, ¶¶68.

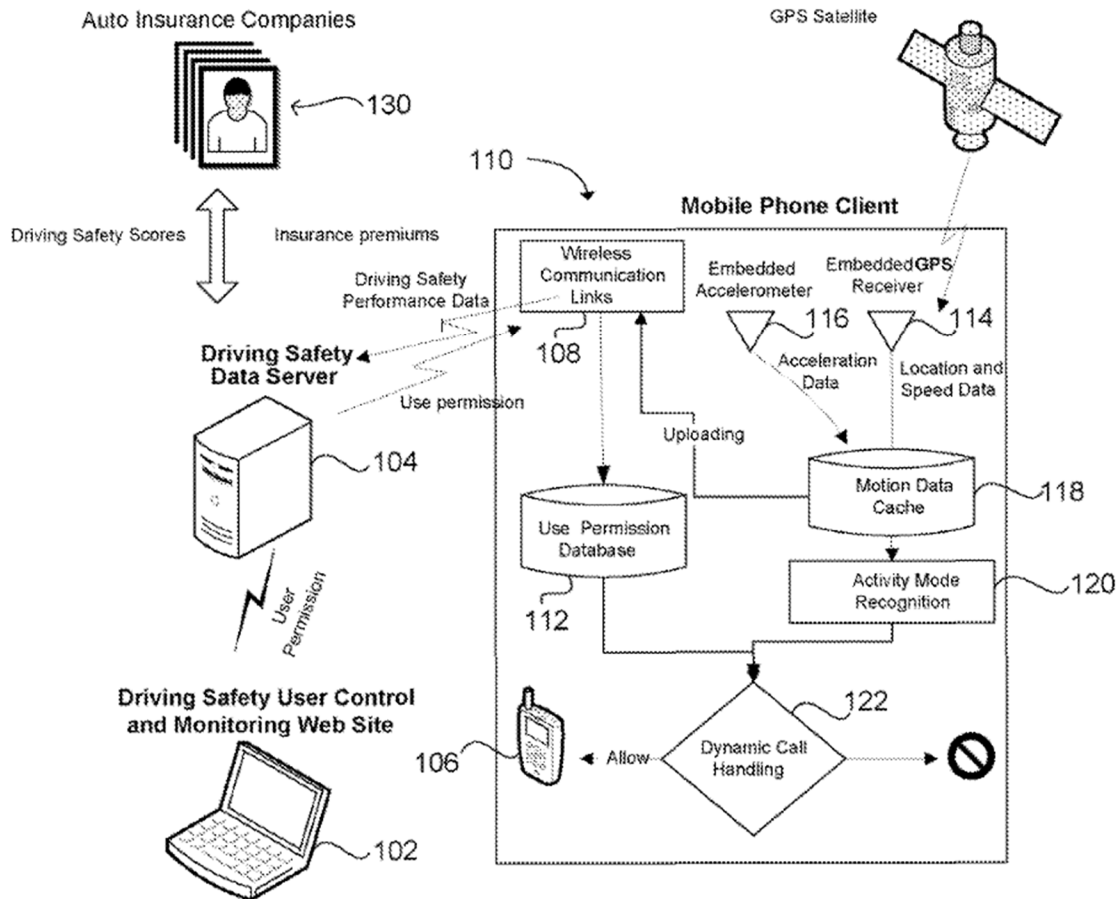


FIG. 1

USAA-1005, Fig. 1

Raw data and resolved driving behavior information are stored in the phone (e.g., “motion data cache 118,” “driving safety performance database 324”) and processed to (1) determine an operating mode of the phone (e.g., “GPS monitoring/navigation mode,” “communication mode”) and (2) generate a user “driving safety score.” *Id.*, Abstract, 3:1-4:6, 8:29-12:18, 13:27-14:26, 17:1-18:4, Figs. 1, 3, 6; USAA-1003, ¶69.

(b) *Rabu*

Rabu uses an accelerometer within a “portable media device” (“PMD”) (e.g., “smart phone”) to determine whether the PMD “is in a dock, resting on a surface, or being handled by a person,” in addition to whether the PMD “is located in a moving or stationary vehicle. USAA-1013, Abstract, 1:1-52, 1:60-2:11, 3:11-28, 6:49-7:6, Figs. 1-8. Rabu leverages those determinations to “choose a particular mode of operation” for the PMD that can promote driver safety by restricting problematic phone interactions. USAA-1013, 1:53-59, 8:13-10:42, Fig. 5; USAA-1003, ¶70. For example, if the PMD is “docked in a moving vehicle,” an operating mode with relatively few restrictions can be chosen. USAA-1013, 8:13-10:42, Figs. 5, 7, 8; USAA-1003, ¶74. Conversely, “if the PMD determines that [it] is being held,” the PMD can for example “prevent the driver from sending or receiving text messages while driving.” USAA-1013, 12:26-43.

Rabu’s PMD is mounted using an “automobile dock.” USAA-1013, 3:11-45, Figs. 1, 2. Figures 1-3 (below) show PMD 100 “coupled to dock 200” and positioned “at an angle 302...” *Id.*, 3:46-50. This “orientation” angle is leveraged to confirm whether the PMD is coupled to dock 200, and to “switch to an associated mode of operation.” USAA-1013, 3:29-4:4, 8:13-24, Figs. 2, 7, 3:46-4:4; USAA-1003, ¶71.

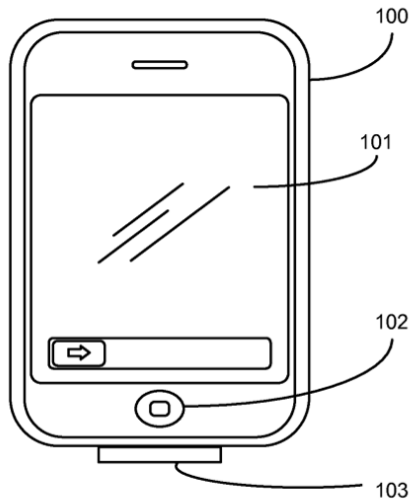


FIG. 1

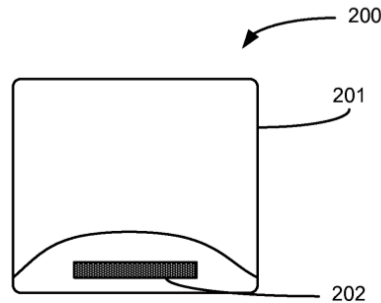


FIG. 2

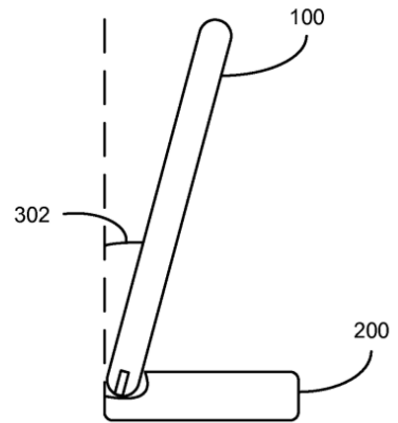
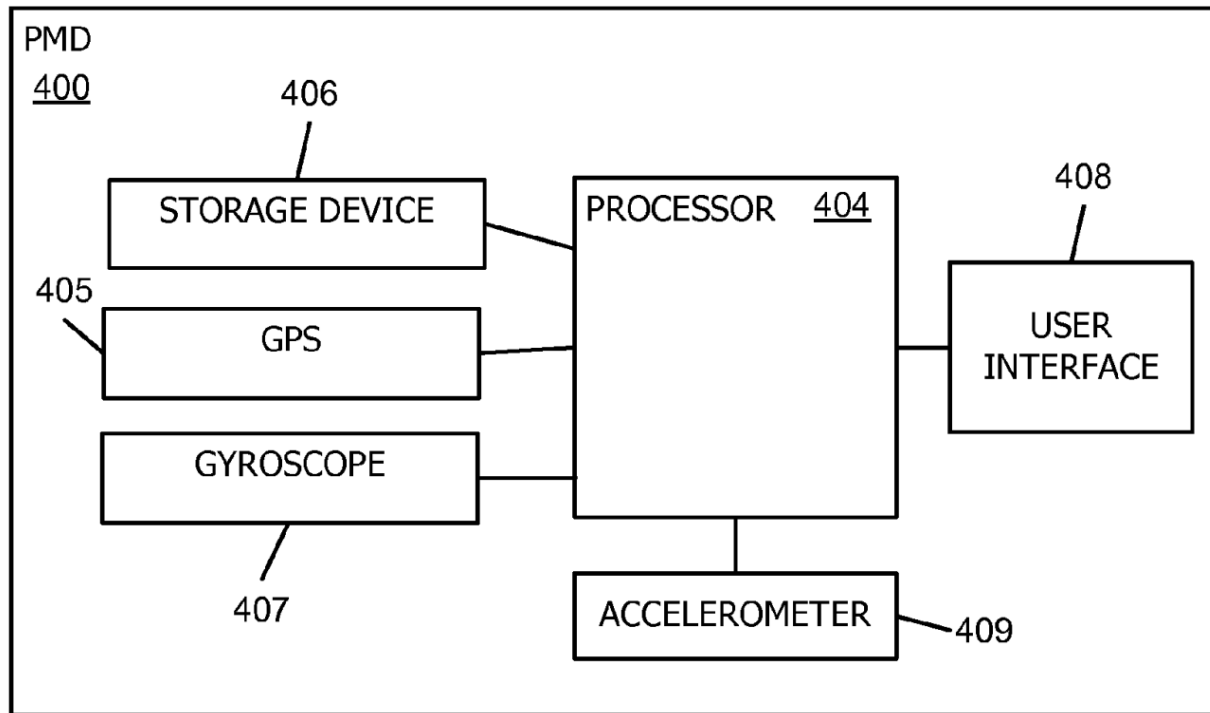


FIG. 3

USAA-1013, Fig. 1

Figure 4 (below) shows PMD 400 with processor 404, user interface 408, accelerometer 409, (GPS) device 405, and storage device 406. USAA-1013, 4:15-20. Processor 404 uses accelerometer 409 to determine the PMD's motion status and orientation angle. USAA-1013, 3:1-28, 4:21-40, Figs. 1, 4; USAA-1003, ¶¶72-73.



USAA-1013, Fig. 4

Rabu uses, e.g., the PMD's accelerometer to make status determinations for the PMD (e.g., held by user versus docked in moving vehicle) and adjust PMD operating mode based on determined status, per Figures 7 and 8 (below). USAA-1013, 8:13-10:42. For example, Rabu describes disabling texting if the PMD is "being held by the driver," rather than docked in the moving vehicle. USAA-1013, 12:26-43; USAA-1003, ¶74.

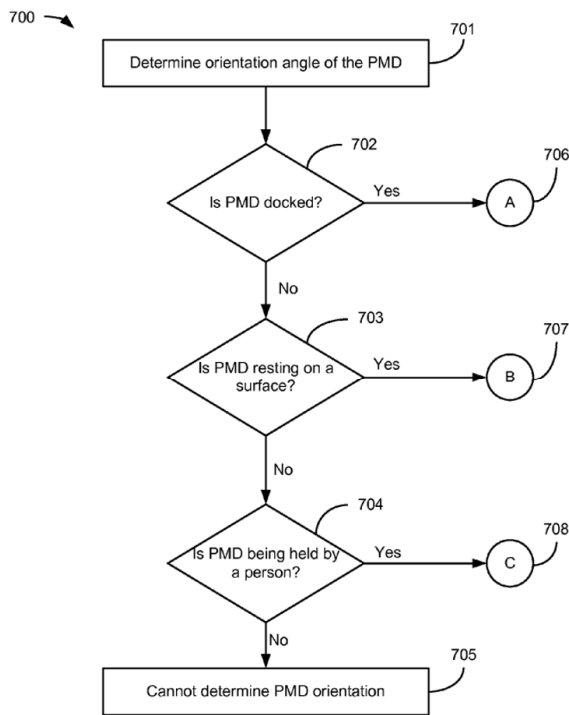


FIG. 7

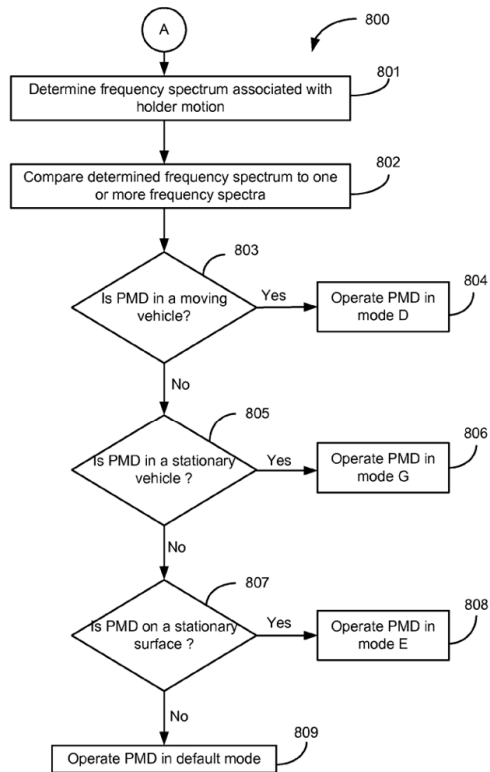


FIG. 8

USAA-1013, Figs. 7, 8

(c) *Curry-Rabu*

A person of ordinary skill in the art (“POSITA”)² would have found obvious integration of Rabu’s dock status sensing and associated mode-shifting capabilities into Curry’s phone, thereby enhancing the Curry’s phone’s ability to promote safe driving. USAA-1003, ¶100. As explained below, the result is a device with added functionality (“Curry-Rabu phone”), capable of defining and determining different types of driving periods based on user inputs and sensor data (including one in which the phone is docked within a moving vehicle, and another in which the

² USAA-1003, ¶¶14-15 (defining a POSITA)

phone is undocked within a moving vehicle), and of appropriately restricting phone use and/or adjusting user driving scores depending on a type of driving period determined. *Id.*

For example, the Curry-Rabu phone would leverage orientation and motion data from its accelerometer to determine both vehicle motion and phone docking status upon a user accepting a phone call while driving, or manually switching from a stationary to driving activity mode through interactions with the phone's user interface. USAA-1003, ¶101; USAA-1013, 3:1-10, 4:21-33, 8:13-10:42, 15:7-22, Figs. 1, 4-5, 7-8. Consistent with both Curry and Rabu, the Curry-Rabu phone would appropriately restrict phone interactions depending on the determined status (e.g., preventing the user from texting while the phone is handheld). USAA-1005, 16:30-17:7, Figs. 3, 6; USAA-1013, 8:13-10:42, Fig. 5; USAA-1003, ¶101.

In greater detail, Curry's client 110 determines phone 106's operating mode and, based on phone sensor data, derives driving behavior information used to generate a user driving safety score. USAA-1005, Abstract, 3:1-4:6, 7:5-22, 8:29-12:18, 13:27-14:26, 17:1-18:4, Figs. 1, 3, 6. The derived driving behavior information may reveal whether/how the user interacts with the phone while driving, and whether the user engages in other risky behaviors such as speeding. *Id.*; USAA-1003, ¶101.

Curry describes two modes: (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. USAA-1005, 9:15-10:14, 12:20-15:22, Figs. 3, 4. Phone 106 switches between these operating modes, for instance, based on an “activity mode” (e.g., “remaining substantially still” or “driving”) that can be activated by the phone’s user and/or in response to sensor data. USAA-1005, 12:20-13:4, 15:18-22; USAA-1003, ¶102. User inputs can, for example, “change[] the activity mode...from stop to driving,” and “the system uses acceleration data...to determine the change...and then further estimate the motion type before or after the change.” USAA-1005, 12:20-26, 15:18-22, Fig. 3. “Access to...calling, texting, and...applications” can be restricted, and “driver safety data can be communicated,” “based on the activity mode....” USAA-1005, 16:30-17:7, Figs. 3, 6.

Curry further 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 phone usage context when generating a user driving score. USAA-1005, 2:3-2:28, 15:8-16:33. One embodiment contemplates an all-or-nothing approach to phone activity restrictions when phone 106 is in a monitoring operating mode; elsewhere Curry recognizes that it can be better to correlate different driving contexts with different phone restrictions. USAA-1003,

¶103; USAA-1005, 2:3-3:28, 15:8-16:33. Curry’s suggestion of a nuanced approach to phone restrictions and to driver scoring that takes into account phone usage context would have motivated a POSITA to seek related practical solutions for implementation. USAA-1005, Abstract, 2:3-3:28, 15:8-16:33; USAA-1003, ¶104.

The POSITA would have found relevant solutions within Rabu, and would have expected success in incorporating Rabu’s solutions within Curry. USAA-1003, ¶105. For example, Rabu describes leveraging a “generally conventional” accelerometer like Curry’s to determine a phone’s orientation angle and motion status, for purposes of discerning phone usage context, and changing the phone’s operating mode to appropriately account for that context. USAA-1013, 3:1-10, 4:21-33, Figs. 1, 4; USAA-1003, ¶105. For instance, as shown in Rabu’s Fig. 5 (below), Rabu describes switching operating modes based on determining that the phone is “docked in a moving vehicle” (as opposed to being “handheld while located in a moving vehicle”). USAA-1013, 8:13-10:42, Figs. 5, 7, 8; USAA-1003, ¶¶105.

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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

USAA-1013, Fig. 5

Similar to Curry, each of Rabu's defined modes of operation include appropriate levels of phone use restrictions. USAA-1013, 1:36-2:14, 5:53-7:6, 12:26-38, Fig. 5. For example, if the phone "is being held by the driver," the processor can prevent texting while driving. USAA-1013, 12:38-43. Conversely, if the phone is docked within a moving vehicle, a POSITA would have found it obvious to change the phone's operating mode to one involving relatively fewer restrictions. USAA-1003, ¶106-107; USAA-1013, 3:1-10, 4:21-33, 6:39-43, Figs. 1, 4.

In another example, consistent with Curry's description of allowing drivers to "talk[] while driving through headsets," a POSITA would have found it obvious to, upon receipt of user inputs, leverage motion and orientation data from the same accelerometer already present in Curry's phone 106 to determine that a driver may

utilize a docked phone's speaker mode while driving. USAA-1003, ¶107; USAA-1005, 14:14-17; USAA-1013, 6:39-43 ("if mode D is selected, the PMD can automatically enable the speaker phone feature for all telephone calls made or received using the PMD"), Fig. 5.

Indeed, the combined disclosures of Curry and Rabu would have amply motivated a POSITA to supplement Curry's teachings of determining the start of a driving period based on user inputs (e.g., initiating a motion estimation process based on a user's interactions with the phone's user interface when accepting a phone call, or when manually changing between activity modes) and sensor data to include, e.g., using accelerometer motion and orientation data to differentiate between defined driving periods in which phone 106 is hand-held, and those in which phone 106 is instead docked. USAA-1003, ¶108; USAA-1005, 14:14-17; USAA-1013, 5:61-6:21, 6:39-43, 8:1-4; Figs. 3-4, 5-8.

The POSITA would have found obvious that enhancing Curry's system based on Rabu would introduce multiple additional advantages (USAA-1003, ¶109), including:

1. increased user tolerance for Curry's monitoring mode, based on more user-friendly levels of restrictions enabled upon a determination that Curry's phone is docked within a vehicle, relative to those present when Curry's phone is undocked (USAA-1003,

- ¶110; 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 for the user, passengers, and others (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 of user driving behaviors based on data obtained from sensors within a docked phone relative to an undocked phone (USAA-1003, ¶112; 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 whether the user violated permissions by using the phone in a hand-held mode, or instead used the phone only while docked (USAA-1003, ¶113; 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 those more nuanced driving scores in, for example, determining insurance premiums (USAA-1003, ¶113; 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).

These among other advantages would have amply motivated a POSITA to integrate Rabu's teachings into Curry in a manner enabling Curry's phone 106 both to determine, based on user inputs and sensor data, a start of a driving period during which phone 106 is docked within a moving vehicle, and to make corresponding adjustments to phone 106's operating modes, determinations of user driving behaviors, and generation of user driving scores. USAA-1003, ¶114; USAA-1005, 9:15-10:14, 12:20-15:22, 16:30-17:7, Figs. 3, 4, 6; USAA-1013, 24:8-3:10.

Moreover, configuring Curry's systems to leverage Rabu's teachings would have required only routine programming knowledge well within the skill of a POSITA prior to the earliest effective filing date. USAA-1003, ¶115. 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. *KSR v. Teleflex*, 550 U.S. 398, 417 (2007); USAA-1003, ¶115.

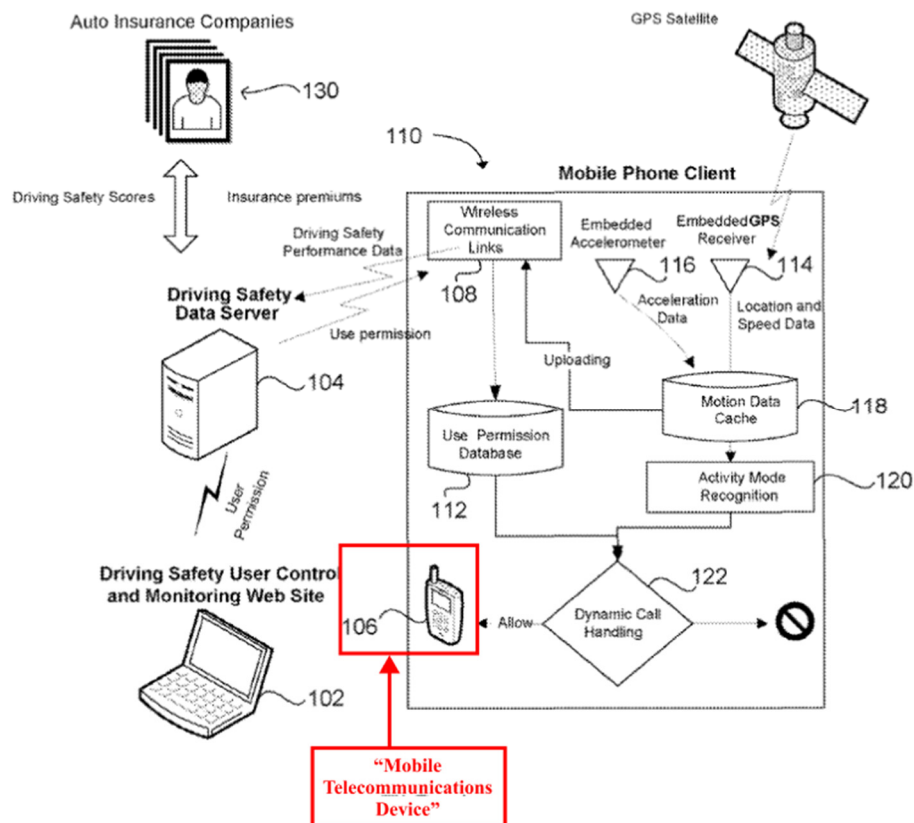
Furthermore, the elements of the resulting combination would each perform functions they had been known to perform prior to the combination—phone 106 would perform the same functions to adjust operating mode based on user inputs and sensor data, to derive driving information, and to generate user scores but, as

taught by Rabu, would leverage both orientation and motion data from its included accelerometer when performing those functions. USAA-1003, ¶116. Accordingly, a POSITA would have naturally expected success when incorporating Rabu's teachings into Curry. *Id.*

2. Claim 1

[1.1]

If the preamble is limiting, Curry-Rabu (§III.A.1(c)) renders it obvious. Curry-Rabu includes an enhanced phone (“*mobile telecommunications device*”) “that may be used...in a vehicle”; for example, an “iPhone 3G smart phone[.]” USAA-1005, Abstract, 2:22-27, 7:5-29, 8:21-27, Fig. 1; USAA-1003, ¶117.



USAA-1005, Fig. 1 (annotated)

The exemplary Apple iPhone 3G included user interfaces enabling interaction with downloaded applications (e.g., “Maps” application). USAA-1003, ¶118; USAA-1005, Abstract, 2:1-27, 3:1-4:28, 10:15-12:18, Fig. 1; USAA-1013, 3:11-28, 4:15-20, Figs. 1, 4; USAA-1078, 21-64; USAA-1079, 1-4, 6-8; USAA-1080, 20, 16-35, 87-92; USAA-1081, 1-5; USAA-1016, ¶¶[0046]-[0063], FIG. 3.



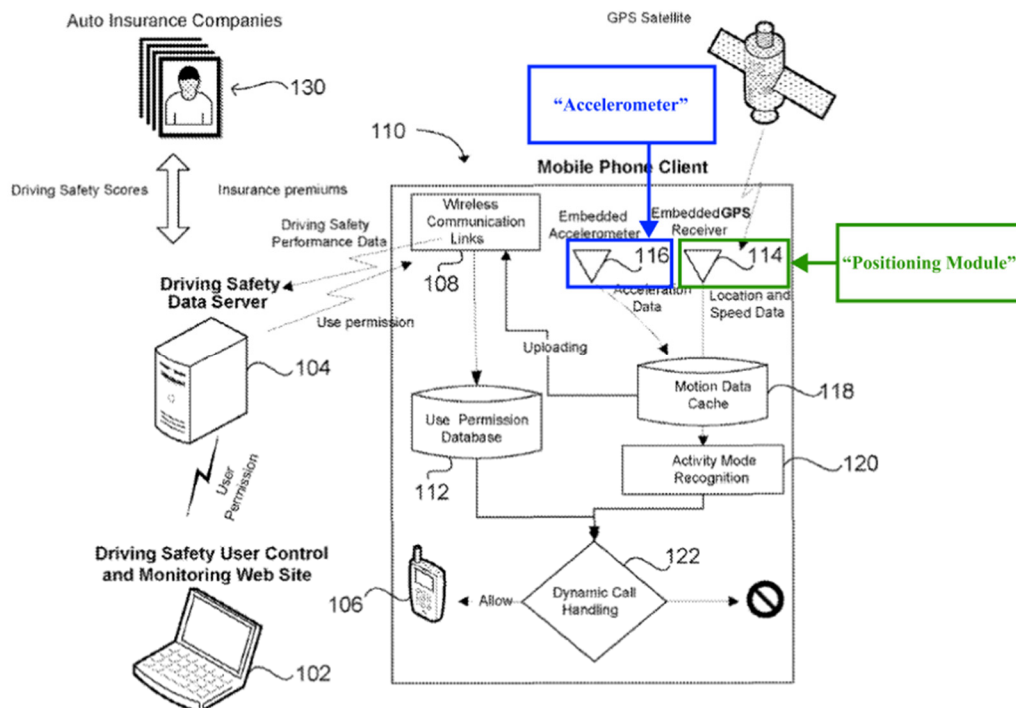
USAA-1080, 38 (left), 90 (right)

The Curry-Rabu phone includes client 110 (downloaded from server 104), which enables determination of whether an associated vehicle is being driven. USAA-1005, 8:20-9:33. Client 110 additionally enables Curry-Rabu phone to process “raw data” from a driving period to derive driving information associated with a user’s driving behavior (“*log driving activity associated with a vehicle*”), and to use the derived information to generate a “driving safety score” for the user.

USAA-1005, Abstract, 7:5-8:2, 8:29-10:26, 13:27-33, Fig. 1. This process involves logging driving activity. USAA-1005, Abstract, 2:1-27, 3:1-4:6, 4:7-11, 7:5-22, 9:31-33, Fig. 1; USAA-1003, ¶119.

[1.2]

Curry-Rabu phone features embedded sensors (“*sensor set*”), including accelerometer 116 (“*accelerometer*”) and GPS receiver 114 (“*positioning module*”). USAA-1005, 3:2-15, 2:23-27, 7:24-8:2, 8:30-9:3, 10:16-26, 11:15-25, Fig. 1; USAA-1079, 2-3; USAA-1080, 87, 88, 108; USAA-1013, 3:11-28, 4:15-58, Figs. 1, 4.



Curry, Fig. 1 (annotated)

Data from sensors and driving information derived from that data is used, for

example, to “monitor driving safety performance,” to “prevent unsafe driving behaviors,” and to “generate driving score[s].” USAA-1005, 7:5-8:2; USAA-1003, ¶120.

[1.3]

Curry-Rabu phone features a “graphical *user interface*” (USAA-1005, 7:20-27, 8:5-18, 20:15-17) configured to display data (*id.*, 21:23-25) and to enable user interactions. Curry describes various examples of UI-enabled user interactions including receiving a phone call while driving, and manually switching activity modes. USAA-1005, 7:5-27, 8:5-27, 9:5-26, 10:15-26, 12:20-26, 15:7-22, 20:23-25; USAA-1003, ¶¶121-23; *supra* [1.1]; (§III.A.1(c)).

[1.4]

The Curry-Rabu phone’s processes may be “implemented in software for execution by various types of processors.” USAA-1005, 6:3-10. For example, “[a] user can download...required software...to the mobile phone [] to set up the client unit [110],” and “client 110 can record location, speed and acceleration data from [embedded] sensors...to a local motion data cache 118 for further processing.” USAA-1005, 3:24-26, 8:20-27. Based on data stored in a “local” cache within the phone “for further processing,” and other references to “mobile computing,” a POSITA would have considered the existence of a processor within the same phone to have been implicitly disclosed, and if not, obvious. USAA-1005, 8:20-

27, Fig. 1; USAA-1015, 237-250. USAA-1003, ¶¶124-25; USAA-1005, 2:22-27, 6:3-10; USAA-1015, 4; USAA-1079, 2-8; USAA-1013, 3:11-28, 4:15-20, 5:3-14, Figs. 1, 4; USAA-1016, ¶¶[0046]-[0063], FIG. 3.

[1.5]

Curry describes “memory devices” (“*memory*”) that store sensor data, derived information, and “executable code.” USAA-1003, ¶126-29; USAA-1005, 6:11-20. A POSITA would therefore have found obvious that Curry-Rabu phone would have included memory devices for storing data; for example, driving behavior information derived from sensor data. USAA-1003, ¶126-29; USAA-1005, 6:5-22, 7:29-8:28, 12:20-15:6, Fig. 3.

[1.6]

As explained in §III.A.1(c), a POSITA would have configured Curry-Rabu phone to determine, based on user inputs and orientation and motion data from accelerometer 116, 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. USAA-1003, ¶133; USAA-1005, Abstract, 1:3-2:28, 9:15-10:14, 12:20-15:33, 16:30-17:7, Figs. 1, 3, 4, 6; USAA-1013, 3:1-10, 4:21-33, 8:13-10:42, Figs. 1, 4-5, 7-8. Curry-Rabu thereby meets each of the requirements imposed by [1.6] (discussed in §I.C) in multiple ways. As explained below, the limitation is first met by a configuration of the Curry-Rabu 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). Curry-Rabu also meets this limitation through other configurations where user inputs and sensor data is not concurrently used, since no such mandate exists within this limitation. USAA-1003, ¶133.

Curry describes multiple embodiments in which a phone determines a start of a driving period during which 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; in each instance, 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. USAA-1003, ¶134; USAA-1013, 3:1-10, 4:21-33, 8:13-10:42, 15:7-22, Figs. 1, 4-5, 7-8.

As shown in Figure 1 (below), 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. USAA-1005, 6:5-22, 8:5-11, 7:30-8:33, 15:7-22. Client 110 also processes "raw data" from a driving period to derive driving

behavior information, including whether the phone is unsafely used during the driving period, and whether the user engages in other unsafe behaviors such as speeding. USAA-1005, 6:5-22, 8:5-11, 7:30-8:33, 15:7-22; USAA-1003, ¶135.

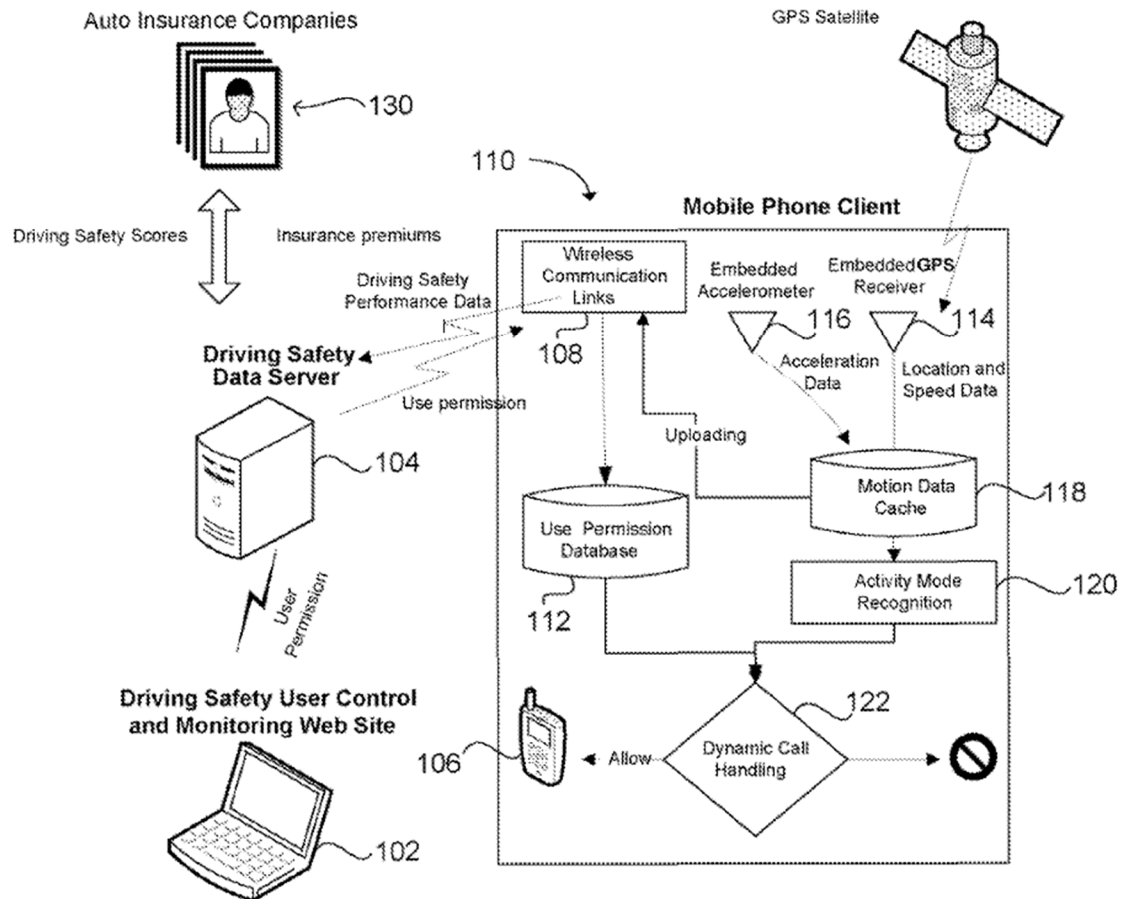
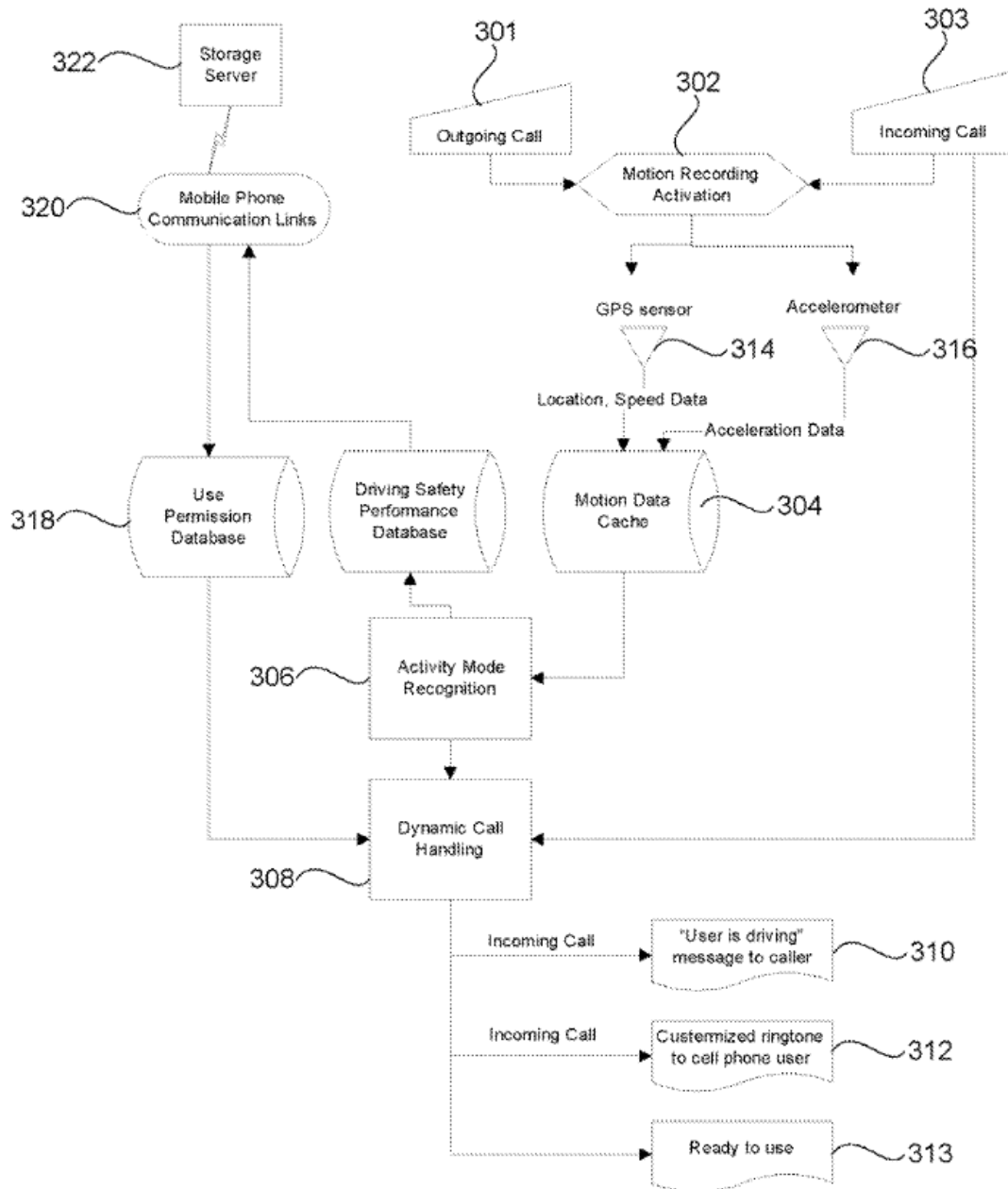


FIG. 1

USAA-1005, Fig. 1

As another example, in connection with Curry's Fig. 3 (below), Curry describes a "driving safety monitoring program on a mobile phone client" that determines, based on user inputs and "recorded time stamped [sensor] data," whether the phone is located within a vehicle that is in use, and that is further configured

both to derive related driving information, and “to allow or disallow users to receive or make a call, text a message...or use...software,” based on that determination. USAA-1005, 12:20-13:26; USAA-1003, ¶136.



USAA-1005, Fig. 3

As another example, in connection with Curry's Fig. 4 (below), Curry describes determining the start of a driving period based on a combination of user inputs received in relation to a call or text and motion data from the phone's sensor set. USAA-1005, 15:7-22. "Right after an incoming phone [call] or text message is received or an outgoing phone call is made" (i.e., right after receipt of user inputs), "the GPS sensor and accelerometer...start to record a motion time series... to determine the type of the current activity," so as to allow identification of "risky behaviors of" talking or texting while driving and adjustment of driving score. USAA-1005, 15:7-22; USAA-1003, ¶137.

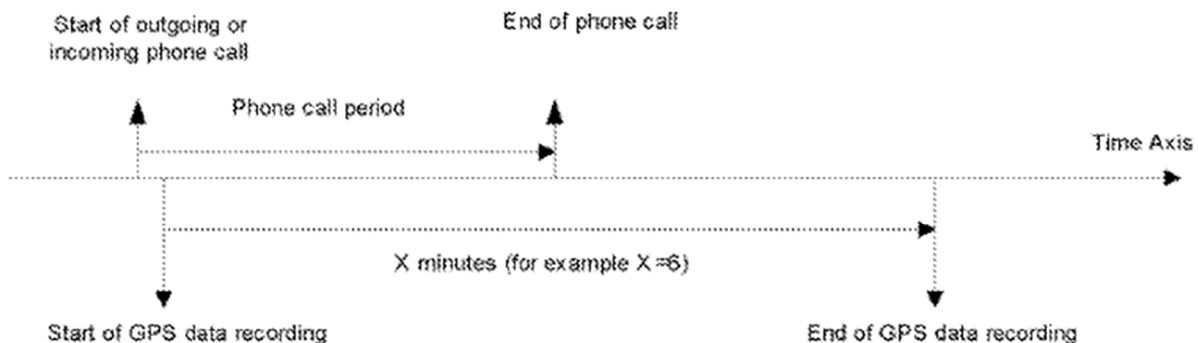


FIG. 4

USAA-1005, Fig. 4

As explained in §III.A.1(c), the POSITA would have found obvious that extending these and other teachings of Curry to further leverage orientation data from the phone's embedded accelerometer to determine a start of a driving period during which the phone is removably attached to the moving vehicle via a docking station,

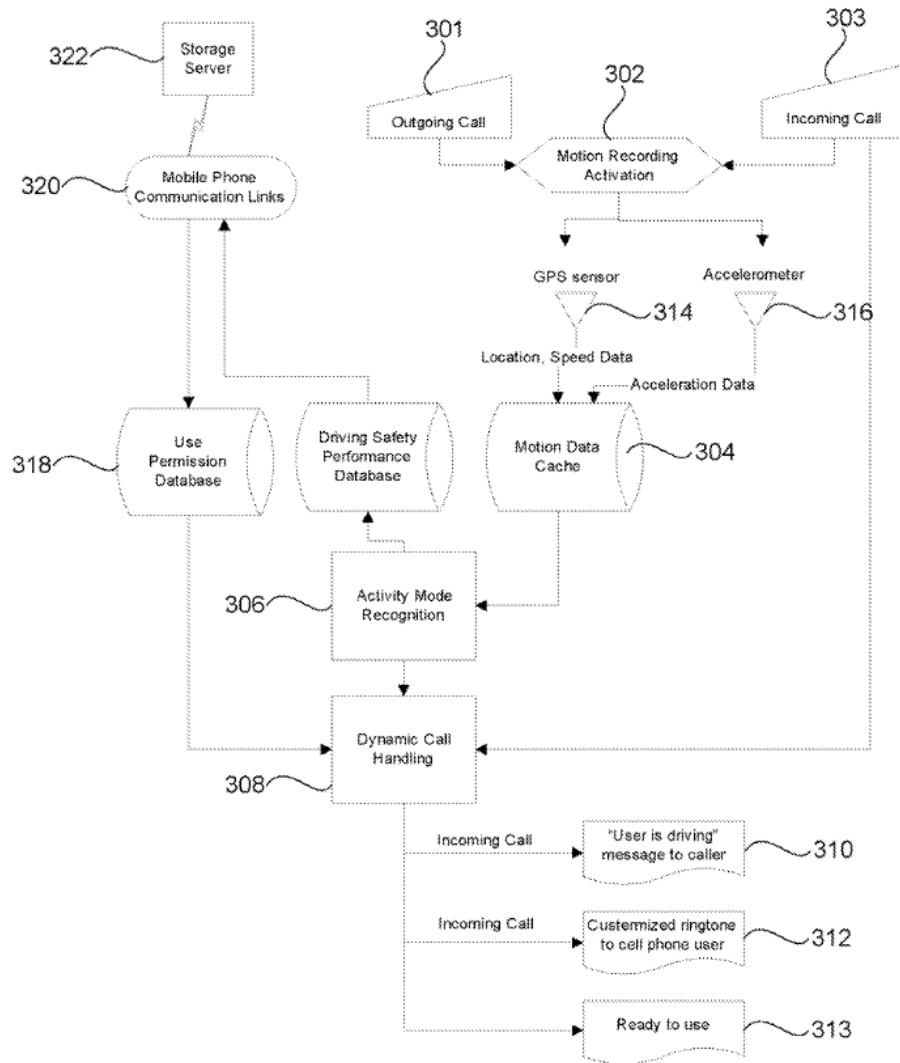
would enable the phone to differentiate instances in which the phone is hand-held during the period from those in which the phone is instead removably attached. USAA-1003, ¶138; USAA-1005, 15:14-17; USAA-1013, 1:36-52, 6:49-7:6. As noted, that capacity for differentiation would in turn have enabled the enhanced Curry-Rabu phone to make corresponding adjustments to phone access restrictions associated with the phone's operating modes, to determinations of user driving behaviors, and to generation of user driving scores, with multiple additional advantages flowing therefrom. USAA-1003, ¶138; USAA-1005, 9:15-10:14, 12:20-15:22, 16:30-17:7, Figs. 3, 4, 6; USAA-1013, 5:61-6:21, 6:39-43, 8:1-4; Figs. 3, 4, 5-8.

Accordingly, the POSITA would have configured the Curry-Rabu phone to determine a start of a driving period during which the phone is docked (“*removably attached to the vehicle*”) while the vehicle is being driven (“*vehicle is in use*”). USAA-1003, ¶¶134-38; USAA-1005, Abstract, 2:3-3:28, 10:15-11:14, 13:20-16:33, 17:30-18:7, Figs. 1, 3, 4, 6; USAA-1013, 3:1-10, 4:21-33, 8:13-10:42, Figs. 1, 4-5, 7-8. Further, as explained above, Curry-Rabu makes that determination based on concurrent use of a user's interactions with the Curry-Rabu phone (“*the inputs received by the user interface*”) and both motion and orientation data from the embedded accelerometer (“*sensor data from the device's sensor set*”). USAA-1003, ¶139.

[1.7]

As explained above, the Curry-Rabu phone processes sensor data (e.g., motion and orientation data) recorded by its embedded sensors (e.g., accelerometer 116) (“*sensor data*”) during the driving period to derive “driving behavior” information, e.g., “talking...or texting...while driving” and “speeding, abnormal acceleration, abnormal deceleration, and taking sharp turns” (“*driving information associated with how the vehicle is driven*”). USAA-1003, ¶¶140-142; USAA-1005, 7:13-29, 8:21-27, 8:30-9:33, 10:15-26, 11:3-17.

With Fig. 3 (below), Curry explains that “[e]ach motion measurement” is associated “with a timestamp” and stored “in a local motion data cache 304 for each pre-specified sampling interval.” USAA-1005, 12:27-31. An “activity mode recognition module 306” uses the “recorded time stamped data to estimate the type of activity” (e.g., “driving, walking, running or remaining substantially still”) “*in real-time*,” both “to allow or disallow users to receive or make a call, text...or use...software programs,” and to derive driving information that is stored in local memory. USAA-1005, 12:20-13:26, Fig. 3; USAA-1003, ¶143.



USAA-1005, Fig. 3

A POSITA would have found obvious processing sensor data during the driving period to derive “possible violations of mobile phone use or unsafe driving behavior[.]” USAA-1005, 7:5-22, 8:29-10:12, 13:20-16:6, Figs. 1, 3; USAA-1015, 233-250; USAA-1003, ¶144. Further, Curry describes various means of processing sensor data, reinforcing the obviousness of sensor data being processed to derive driving information. USAA-1005, 11:3-14, 13:20-14:26, Fig. 3; USAA-

1003, ¶145.

[1.8]³

Curry-Rabu phone stores information derived from processed sensor data (“*selection of driving information*”) to memory (e.g., motion data cache 118, local memory) (“*memory*”) prior to transmission (e.g., to driving safety data server 104). USAA-1003, ¶146; USAA-1005, 7:5-22, 8:29-10:12, 13:20-16:6, Figs. 1, 3; USAA-1015, 233-250. From Curry, a POSITA would have found it obvious to store all or a subset of the derived driving information in the memory of the Curry-Rabu phone, and thus, to store a selection of the driving information to the memory. USAA-1003, ¶146. Notably, the plain meaning of a “selection of the driving information” is not limited to a selection of a subset of the same, but instead is broad enough to encompass selection of some or all of that information.

Still, to the extent that this limitation is narrowly interpreted to require a selection of less than all for storage, a POSITA would have found obvious to store in the Curry-Rabu phone a subset of (i.e., selection of) the recorded sensor data since,

³ The “selection” of driving information is improper inferential claiming, and therefore non-limiting, since such selection is not one of the operations recited to be performed by the “mobile telecommunications device.” *Ex Parte Sullivan*, Appeal No. 2002-1924 (PTAB June 20, 2016).

e.g., Curry explains that “motion data cache can be compared with the user permission data to enable a driver safety statistic to be calculated,” indicating that specific aspects of recorded sensor data are more useful for storage and transmission to safety data server 104 (e.g., motion data indicating possible use violations, unsafe driving behavior). USAA-1003, ¶146. USAA-1005, 3:24-4:6, 7:5-22, 8:29-10:12, 13:20-16:6, Fig. 1; USAA-1015, 233-250. A POSITA would have also recognized a variety of entities to which recorded data is relevant (e.g., “user's parents,” “guardian, “insurance company”) and thereby found obvious to implement Curry-Rabu to store specific aspects of recorded sensor data unique to a particular entity. USAA-1005, 4:8-11; USAA-1003, ¶146.

A POSITA would have also found obvious that data stored in local memory (e.g., database 324) includes “a selection of the driving information,” at least insofar as Curry describes driving information as being 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. USAA-1003, ¶148; USAA-1005, 11:3-14, 13:29-14:26, Fig. 3; USAA-1003, ¶¶147-148. Each stored activity estimation result includes a selection of driving information for the corresponding interval. USAA-1005, 12:29-13:4; USAA-1005, Abstract, 2:1-27, 3:24-4:6, 4:7-11, 7:5-22, 8:29-10:12, 13:20-16:6, Figs. 1, 3.

[1.9]

As discussed for [1.7], Curry-Rabu phone processes sensor data during a driving period to derive driving information. USAA-1003, ¶149; USAA-1005, 7:5-22, 8:29-10:12, 13:20-16:6, Fig. 1. Curry also describes “a driving safety monitoring program on a mobile phone client” including an “activity mode recognition module 306” that processes “recorded time stamped” data from the mobile phone’s sensor set during a determined driving period to derive driving information. USAA-1005, 13:20-14:26; USAA-1003, ¶150.

A POSITA would have found it obvious to configure a Curry-Rabu 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. USAA-1003, ¶151; USAA-1005, Abstract, 2:1-27, 3:24-4:11, 7:5-22, 8:29-10:12, 13:20-16:6, Figs. 1, 3. In those disclosures, Curry never once describes or suggests leveraging the vehicle’s sensors. USAA-1003, ¶151; USAA-1005, Abstract, 2:1-27, 3:24-4:11, 7:5-22, 8:29-10:12, 13:20-16:6, Figs. 1, 3. To this point, a POSITA would have understood and found obvious from Curry that vehicle sensor data is not necessary to derive driving information as Curry instead discloses leveraging sensors, processors, and memory found in the Curry-Rabu phone to derive the driving information. USAA-1005, 11:15-25; USAA-1013, 1:36-2:14; USAA-1003, ¶152. This remains

true even if a POSITA were to consider Curry's disclosure to be open-ended given other disclosures relating to other types of data distinct from the recorded sensor data. *Compare* USAA-1005, 15:24-32 *with* USAA-1005, 8:29-10:12, 13:20-14:26, Figs. 1, 3; USAA-1003, ¶153.

[1.10]

Client 110, which Curry contemplates downloading from server 104 (“***downloaded application***”), enables the phone to process sensor data from a driving period to derive information associated with a user's driving behavior. USAA-1005, 7:5-29, 9:5-11, 8:21-9:33. Derived driving behavior information is stored in the Curry-Rabu phone, and client 110 processes the stored information to determine a mode within which the mobile phone should operate. *Id.*, Abstract, 3:1-3:6, 7:5-22, 8:29-12:18, 13:3-19, 13:27-14:26, 16:13-18, 17:1-18:4, Figs. 1, 3, 4, 6. A POSITA would have also found it obvious to configure the client 110 to “***control***” the Curry-Rabu phone by, for example, configuring an accelerometer to record sensor data. USAA-1003, ¶154.

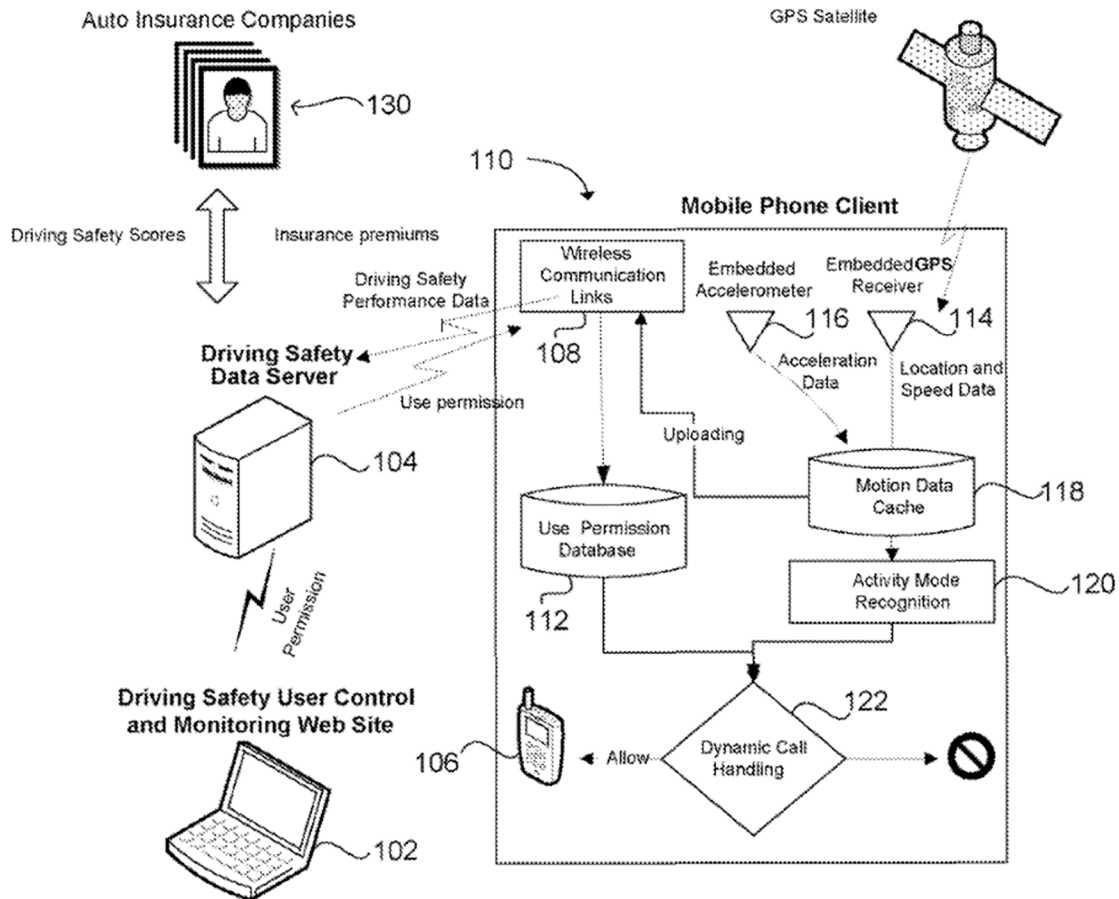


FIG. 1

USAA-1005, Fig. 1

Also, in view of various embodiments of Curry, a POSITA would have found it obvious to configure the Curry-Rabu phone to detect predetermined events and to execute responsive actions, and to perform these operations on an application residing on (and downloaded to) the phone. USAA-1003, ¶155. In some embodiments, the Curry-Rabu phone detects an incoming phone call or text message while a user is driving a vehicle (“*predetermined event*”), and in response, starts to estimate activity from a motion time series (“*predetermined*”).

action”). USAA-1005, 16:7-22. As another example, sensor data collected by the phone is used to identify unsafe driving behaviors (“*predetermined event*”) and, in response, transmit driver safety information to server 104 (“*predetermined action*”) and/or adjust phone restrictions in real-time (“*predetermined action*”). USAA-1005, 11:15-25, 12:20-13:26, Fig. 3. Additionally, the phone determines that a context associated with driver safety information indicates that a driver is talking or texting while driving (“*predetermined event*”) and, in response, adjusts a safety score for the driver based on the detected activity (“*predetermined action*”). *Id.*, 11:3-14.

3. Claims 2, 5, 9, 11-13

[2]

As discussed for [1.1] and [1.5], data collected by embedded sensors of the Curry-Rabu phone is stored in motion data cache 118 (“*storing driving information associated with that event to the memory*”). This stored data is evaluated to identify events, such as the existence of unsafe driving behaviors (detect an “*event*”), and driving safety data is *associated with that event*. In some embodiments, the phone initiates the start of recording data for storage in motion data cache 118 in response to detecting an incoming phone call or text message while a user is driving a vehicle (“*predetermined event*”). USAA-1005, 16:7-22; *id.*, 3:24-6:6, 8:30-9:3; USAA-1003, ¶156.

[5.1]

In some instances, the Curry-Rabu phone determines that driver safety information indicates a potential unsafe driving behavior (e.g., receiving a phone call while driving) (“*event*”), and in response, transmits the driver safety information to server 104 (“*communicating to a remote system that an event has been detected*”). USAA-1005, 8:21-9:3, 9:23-28, 11:15-25, 16:7-22; USAA-1003, ¶157.

[5.2]

A POSITA would have found it obvious to implement Curry such that the Curry-Rabu phone receives a request from server 104 to transmit monitored information (“*request to transmit to the remote system selected portions of the driving information associated with the detected event*”). USAA-1003, ¶158; USAA-1005, 3:2-15. Further, “[c]ommunication protocols between a mobile device and a server were well known by the Critical Date” and “[t]he specific configuration of these communication protocols was also an obvious design choice by the Critical Date because systems that enabled various types of communication between these devices were also well known by the Critical Date.” USAA-1003, ¶158 (citing USAA-1041, 11). A POSITA would have also found it obvious to configure server 104 to request portions of the data recorded by the phone (“*selected portions of the driving information*”) that are relevant to further analysis by server 104. USAA-1041, 11(citing USAA-1005, 9:23-28).

[9]

As discussed for [1.7] and [1.10], data collected by embedded sensors of Curry-Rabu phone is processed during a monitoring period to determine whether a vehicle is being driven safely, i.e., driver safety information (“***process the driving information***”). USAA-1005, 3:24-4:11, 7:5-22, 9:31-10:12. The driver safety information includes a safety score (“***driving score associated with a particular driver***”). The safety score is calculated based on “perform[ing] a statistical analysis on collected raw driving data.” *Id.*, 7:5-22. Examples of safety score calculation including factoring “unsafe behaviors of talking-while-driving and texting-while-driving,” which are “associated with different point penalties.” *Id.*, 13:3-19. Further, the safety scores can be used in different applications, such as “by consumers and insurance agencies to determine insurance premiums for related drivers” or “by parents to prevent their teenage drivers from operating a motorized vehicle while...performing [] unsafe driving actions” and “to proactively control the use of mobile devices while [] commercial vehicle drivers are operating vehicles[.]” *Id.*, 7:5-22; USAA-1003, ¶¶160-61.

[11]

As discussed for [1.10], Curry-Rabu phone can determine that a driver is talking or texting while driving (“***detect occurrence of a predetermined event***”).

USAA-1005, 11:15-25. In response, Curry-Rabu phone uploads driver safety information stored in motion data cache 118 to server 104 via wireless connection 108 for additional processing (“*transmitting driving information via a wireless telecommunication module of the mobile telecommunication device to a remote system*”). USAA-1005, 7:5-22, 8:21-27, 9:23-28; USAA-1003, ¶162.

[12]

A POSITA would have found obvious that the Curry-Rabu phone includes a device battery (“*power supply*”) given non-limiting disclosure of a phone encompassing “any type of electronic mobile computing device that may be used while traveling in a vehicle.” USAA-1003, ¶163; USAA-1005, 7:23-29. Curry also references the Apple iPhone 3G smartphone, which includes a battery. USAA-1005, 2:22-27; USAA-1003, ¶163 (citing USAA-1079, 2; USAA-1080, 33-35).

[13]

The Curry-Rabu phone encompasses “any type of electronic mobile computing device that may be used while traveling in a vehicle,” including “cell phones, smart phones.” USAA-1003, ¶164; USAA-1005, 2:22-27, 7:23-29.

B. [GROUND 1B] – Curry-Rabu-Balachandran Renders Claims 3 and 4 Obvious

1. Proposed Combination

(a) *Balachandran*

Balachandran is focused on “enabling emergency call initiations in response

to the detection of a vehicle accident.” USAA-1007, Abstract. This involves an activation signal being transmitted between vehicle sensors that detect an accident and a cellular telephone used for an emergency call. *Id.*, 1:34-47. Balachandran further contemplates activation of “a timer for delaying initiation of an outgoing call to an emergency number, such as 911.” *Id.* Upon expiration, the cellphone “initiates an emergency call setup to the mobile switching center servicing the telephone unit.” *Id.*, 1:48-67. The cellphone can provide “[a]n audio or visual indication [that] notifies the passengers of activation of [a] timer 35 and ceases with expiration or cutoff of the timer.” *Id.*, 2:46-63; USAA-1003, ¶75.

(b) *Curry-Rabu-Balachandran*

Curry provides broad motivation towards “programs and initiatives to reduce traffic-related fatalities and injuries.” *Id.*, 2:9-21. It further expresses a concern for “motorized vehicle accidents and deaths[,]” which it addresses by proposing techniques that “reduce potentially catastrophic accidents for which [a] company may be responsible.” *Id.*, 11:26-12:2. A POSITA would have understood that this motivation would have benefited from unwanted accidents and deaths, including through programs and initiatives. USAA-1003, ¶165-166.

With this insight, a POSITA would have looked to incorporate emergency response techniques well-known by the Critical Date into Curry-Rabu. USAA-1003, ¶167. Balachandran is one example where an emergency call is initiated by

a cellphone in response to detection of a vehicle accident. USAA-1006, Abstract.

This would have motivated a POSITA configure the Curry-Rabu phone to perform Balachandran's emergency response technique to prevent casualties resulting from a vehicle accident. USAA-1003, ¶167.

The Curry-Rabu-Balachandran phone would have solicited emergency responses in scenarios where a vehicle accident occurs even though sensor data recorded by the phone indicates safe driving behaviors (e.g., not texting or calling while driving). *Id.* Further, because Curry contemplates data sharing with external systems (e.g., server 104, insurance company 130), a POSITA would have found it obvious to configure the phone to incorporate the Balachandran emergency response techniques as an implementation detail. USAA-1005, 9:23-10:12; USAA-1003, ¶168 (citing USAA-1021, USAA-1022, USAA-1023).

2. Claims 3, 4

[3.1]

Balachandran describes sensors configured to detect an accident (“*event [that] has been detected*”). USAA-1007, 2:16-27, 4:5-21. Upon detecting an accident, cellphone initiates an emergency call after a timeout period. *Id.*, Abstract, 2:64-3:6. The cellphone provides “[a]n audio or visual indication [that] notifies the passengers of activation of [a] timer 35 and ceases with expiration or cutoff of the timer.” *Id.*, 2:46-63. The cellphone also “provides an audible

indication” of “initiat[ing] [an] emergency call setup[.]” *Id.* Notifications relating to timer 35, such as audio or visual output, are used to indicate an accident has been detected (“***providing feedback to a user***”). USAA-1003, ¶169. A POSITA would have also found obvious that in some instances an accident is detected (and an audible or visual notification of the detected accident is provided) in response to the phone identifying an unsafe driving behavior (“***occurrence of a predetermined event***”). *Id.*, ¶170 (citing USAA-1005, 9:23-28).

[3.2]

Balachandran’s emergency response technique involves a cellphone providing interface 45 through which “[a]n individual may cancel initiation of an emergency call...if no emergency assistance is required.” USAA-1007, 2:16-27, 4:5-21. The cellphone “checks for a user abort command discontinuing the call setup procedure.” *Id.*, 4:22-31. A POSITA would have found it obvious to implement interface 45 as a graphical user interface since Balachandran teaches that the cellphone is capable of providing a “***visual indication*** [that] notifies the passengers of activation of timer” relating to an emergency call. USAA-1003, ¶171; USAA-1007, 2:46-63. Indeed, the Curry-Rabu-Balachandran phone would have received a user abort command relating to an emergency call (“***receive a user interaction to...deny whether the detected event has actually occurred following said feedback***”).

[4.1]

As discussed for [3.1], the Curry-Rabu-Balachandran phone would have provided an audio or visual indication that an accident has been detected.

Balachandran describes that the indication “notifies the passengers of activation of the timer 35 and ceases with expiration or cutoff of the timer.” USAA-1007, 2:46-63. Thus, the Curry-Rabu-Balachandran phone would have notified a user that an emergency call has been scheduled (“*further action [that] has been scheduled*”) after a time period specified by a timer (the action “*will be taken with a predetermined period*”). USAA-1003, ¶172.

[4.2]

As discussed for [3.2], the Curry-Rabu-Balachandran phone would have received a user abort command relating to an emergency call. USAA-1006, 2:64-3:6, 4:22-31. Thus, Curry-Rabu-Balachandran phone would have been configured to receive a user abort command (“*user interaction...to deny whether the further action should be taken*”) relating to an emergency call to be initiated after a time period specified by a timer (the action “*will be taken with a predetermined period*”). USAA-1003, ¶173.

C. [GROUND 1C] – Curry-Rabu-Katayama Renders Claims 6-8 Obvious

1. Proposed Combination

(a) Katayama

Katayama is focused on 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[.]” USAA-1024, [0001]. The driving recorder can “prevent an accident by making [an] after-the-fact analysis on an ordinary driving or collect an objective evidence of a cause of the accident when the accident occurs.” *Id.*, [0002]; USAA-1003, ¶76.

The recorder (e.g., recorder 1 in Figure 4 below) detects an accident based on multiple data sources, including acceleration data, position data, speed data, brake data, and door open/close data. USAA-1024, [0013]; USAA-1003, ¶77.

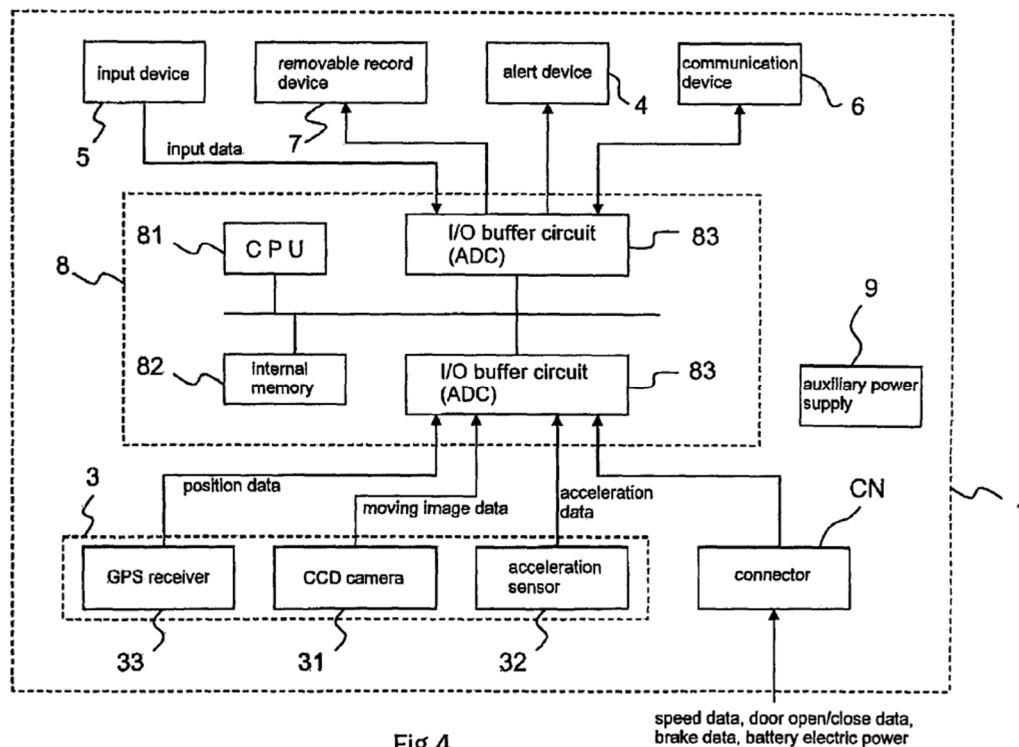


Fig.4

USAA-1024, Fig. 4

Recorder 1 includes information processing device 8 with internal memory

82 for storing programs executed by CPU 81. *Id.*, [0034], [0044]. Information processing device 8 includes data receiving section 801, temporary storage section 802, situation data storage selection 803, data administration section 804, and judgement criterion parameter storage section 805. USAA-1024, [0044]. Data receiving section 801 “receives [] situation data as being data concerning the behavior, the surrounding situation or the link of the motor vehicle V at a constant sampling time one after another in a chronological order and writes the situation data...in the temporary data storage section 802[.]” *Id.* 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.*, [0046]; USAA-1003, USAA-1003, ¶¶78-79.

(b) *Curry-Rabu-Katayama*

Curry’s phone includes motion data cache to “record data from the GPS receiver and accelerometer.” USAA-1005, 3:2-15, 3:24-4:6. Recorded data is used for “further processing[]” and motion data cache is “used to store raw data for an extended period of time to provide sufficient information for a user activity mode recognition program 120.” *Id.*, 7:30-8:3. However, Curry does not address storage constraints or specific storage configurations of motion data cache. USAA-1005,

3:2-15, 3:24-4:6. Such configurations represent implementation details that would have been obvious to incorporate into Curry's disclosure. USAA-1003, ¶174 (citing USAA-1045).

A POSITA would have recognized that motion data cache has a finite storage capacity and, as a result, would have looked to well-known data handling techniques to address storage constraints. USAA-1003, ¶175. In performing this search, a POSITA would have discovered Katayama, which describes a storage device with multiple storage sections (sections 802, 803). USAA-1024, [0044]-[0046]. Katayama also addresses storage constraints of storage device and offers techniques to address them, for example by using "judgment criterion parameters" to determine whether stored data should be transferred to situation data recording section 803. *Id.*, [0046].

Katayama thereby informs a POSITA that not only does storage constraints of mobile devices necessitate different types of storage, but these constraints can be resolved by transferring data to permit data preservation. USAA-1003, ¶176. This would have motivated a configuration in which Curry's local motion cache implements Katayama's storage technique. *Id.* This would have improved Curry as it would "eliminat[ed] accumulation of useless data" (as taught in Katayama). USAA-1024, [0053]; *see* USAA-1003, ¶177 (citing USAA-1042).

2. Claims 6-8

[6.1]

In Katayama, a recording device includes information processing device 8 (“*memory*”) with situation data recording section 803 (“*long term memory for persistently storing driving information*”) and temporary data storage section 802 (“*short term memory for transiently storing driving information*”). USAA-1024, [0044]-[0046], Fig. 5. A POSITA would have found it obvious to configure motion data cache of the Curry-Rabu phone to include Katayama’s situation data recording section 803 and temporary data storage section 802, which would have addressed storage constraints and improved storage capabilities by removing the need to accumulate useless data. USAA-1005, 8:30-9:3, 3:2-15, 3:24-4:6; USAA-1024, [0044]-[0046], [0053]; USAA-1003, ¶178.

[6.2]

A POSITA would have found obvious that temporary data storage section 802 (“*short term memory*”) obtains situation data more frequently (“*higher update rate*”) than situation data recording section 803 (“*long term memory*”). USAA-1024, [0044]-[0046], Fig. 5. Katayama teaches that situation data is transferred to situation data storage section 803 “[o]nly in a case that the content meets the predetermined condition[.]” *Id.*, [0046]. Further, “[i]f a capacity of the temporary data storage section 802 runs out, old data is sequentially erased and new situation data is written in the temporary data storage section 802.” *Id.*, [0045]. In scenarios

where situation data is periodically recorded but no accident is detected, old data stored in temporary data storage section 802 is more frequently erased relative to situation data being transferred to situation data storage section 803. USAA-1003, ¶179.

[6.3]

Katayama teaches “receiv[ing] the situation data...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[.]” *Id.*, [0045]. Thus, Katayama teaches that temporary data storage section 802 records situation data (“*write driving information to the short term memory*”) at a constant sampling rate (“*predetermined update rate*”) and while a vehicle is monitored according to a chronological order (“*predetermined sequence*”). USAA-1024, [0044]-[0046], Fig. 5; USAA-1003, ¶180.

[6.4]

Katayama describes overwriting previously collected situation data stored in temporary data storage section 802 (“*overwrite the driving information previously written to the short term memory*”) with new situation data collected according to a constant sampling rate (“*in accordance with the predetermined sequence*”). USAA-1024, [0044]-[0046], Fig. 5. Specifically, Katayama teaches “[i]f a capacity of the temporary data storage section 802 runs out, old data is sequentially

erased and new situation data is written in the temporary data storage section 802.”

Id., [0045]; USAA-1003, ¶181.

[7.1]

The Curry-Rabu-Katayama phone would have detected an accident (“***detect occurrence of a predetermined event***”) based on acceleration data and GPS data.

USAA-1024, [0009], [0013], [0019]; USAA-1003, ¶182.

[7.2]

Katayama describes transferring situation data (“***data***”) from temporary data storage section 802 (“***short term memory***”) to situation data recording section 803 (“***long term memory***”) in response to satisfaction of predetermined conditions associated with accident detection. USAA-1024, [0046]. The conditions can relate to acceleration data, such as “whether or not the acceleration (deceleration) exceeds a predetermined judgement criterion,” or “whether or not the acceleration continues for more than or equal to a certain period[.]” *Id.*, [0048]. In some circumstances, situation data is transferred from temporary data storage section 802 to situation data recording section 803 “***in response to***” the accident being detected. USAA-1003, ¶183.

[8.1]

Katayama describes a set of vehicle sensors (“***external device***”) configured to sense data related to “the behavior, surrounding situation, and operating condition or the like of [a] motor vehicle V” (“***external driving information associated***

with a condition of the vehicle”). USAA-1024, [0034], [0064]. The Curry-Rabu-Katayama phone would have obtained data from vehicle sensors, which would have improved the accuracy of monitoring for unsafe driving behaviors. USAA-1003, ¶184.

[8.2]

As discussed for [8.1], Katayama describes the data used for accident detection includes position data, speed data, brake data, and door open/close data (“*at least a portion of the external driving information*”). Since this data is collected by external vehicle sensors to detect accidents, the Curry-Rabu-Katayama phone would have received at least a portion of the data collected by external vehicle sensors (“*external device*”). USAA-1003, ¶185.

D. [GROUND 1D] – Curry-Rabu-Tamir Renders Claim 10 Obvious

1. Proposed Combination

(a) *Tamir*

Tamir is focused on a traffic information system that evaluates driver behavior in a vehicle. USAA-1006, Abstract. In Tamir’s data collection technique, “samples are collected at a dynamically adjusted rate,” by determining a sampling rate “according to the location of the driving[.]” *Id.*, 9:10-20. This involves “accumulating more samples at areas where there are many accidents or near intersec-

tions.” *Id.* The sampling rate can also be adjusted according to “the driving behavior of the vehicle[.]” *Id.*, 20:52-21:11; USAA-1003, ¶80.

(b) *Curry-Rabu-Tamir*

. A POSITA would have looked to well-known data collection techniques in implementing Curry’s teachings relating collecting sensor data (e.g., accelerometer data, position data). USAA-1003, ¶186; USAA-1005, 13:27-33.

In doing so, a POSITA would have been aware of well-known data collection techniques in vehicle monitoring systems with variable data sampling rates. USAA-1003, ¶187. Tamir discloses one example in which a sampling rate is adjusted based on conditions associated with data collection (e.g., location of driving, driving behavior). USAA-1006, 9:10-20, 20:52-21:11. A POSITA would have recognized that incorporating Tamir’s data collection technique into Curry-Rabu would have improved motion recording process by, for example, allowing “lower power consumption and less wear and tear of” a phone, as taught in Tamir. USAA-1006, 20:52-21:2; USAA-1003, ¶187 (citing USAA-1017, 5:61-6:9, 9:3-7; USAA-1018, [0019]; USAA-1019, 5:1-3).

2. Claim 10

[10]

The Curry-Rabu-Tamir phone would have used Tamir’s data collection technique to improve Curry’s motion recording process using variable sampling rates.

USAA-1006, 9:10-20, 20:52-21:11. Tamir describes that “the sampling rate is adjusted according to the driving pattern of vehicle 15” and that “when it is determined that the driver is driving relatively daringly, a higher sampling rate is used.” *Id.*, 20:52-21:2. Tamir also contemplates adjusting data collection “at special occasions, such as when an accident is possible.” *Id.* A POSITA would have found it obvious that in scenarios in which the phone detects an unsafe driving behavior (“*an event*”), a higher sampling rate is used for data collection relative to other scenarios (“*driving information captured at a higher sampling rate than when an event is not detected*”). USAA-1003, ¶188. Further, in some embodiments, the phone initiates the start of recording data for storage in motion data cache 118 in response to detecting an incoming phone call or text message while a user is driving a vehicle (“*predetermined event*”). USAA-1005, 16:7-22; *id.*, 3:24-6:6, 8:30-9:3.

**E. [GROUND 2A] – Forstall-Rabu-Langle2009 Renders
Claims 1, 2, 12, 13 Obvious**

1. Proposed Combination

(a) *Forstall*

Forstall describes using a mobile device with embedded sensors for vehicle navigation. USAA-1028, [0004]. The mobile device provides “the ability to provide directions from a point of origin to a destination” and “display[s] a current po-

sition on a map as well as deliver navigation instructions based on the current position to route a user to a desired destination.” *Id.*; USAA-1003, ¶¶81-82.

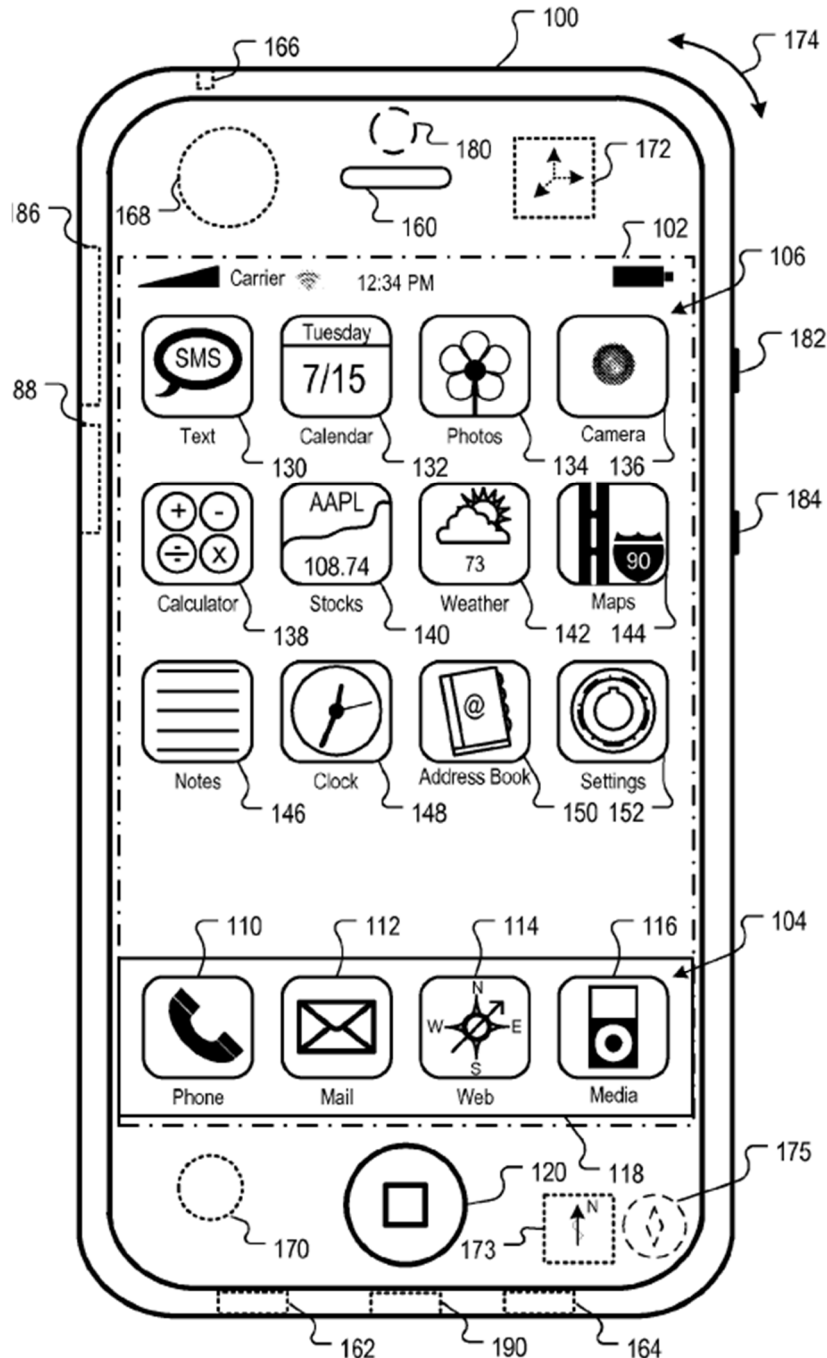


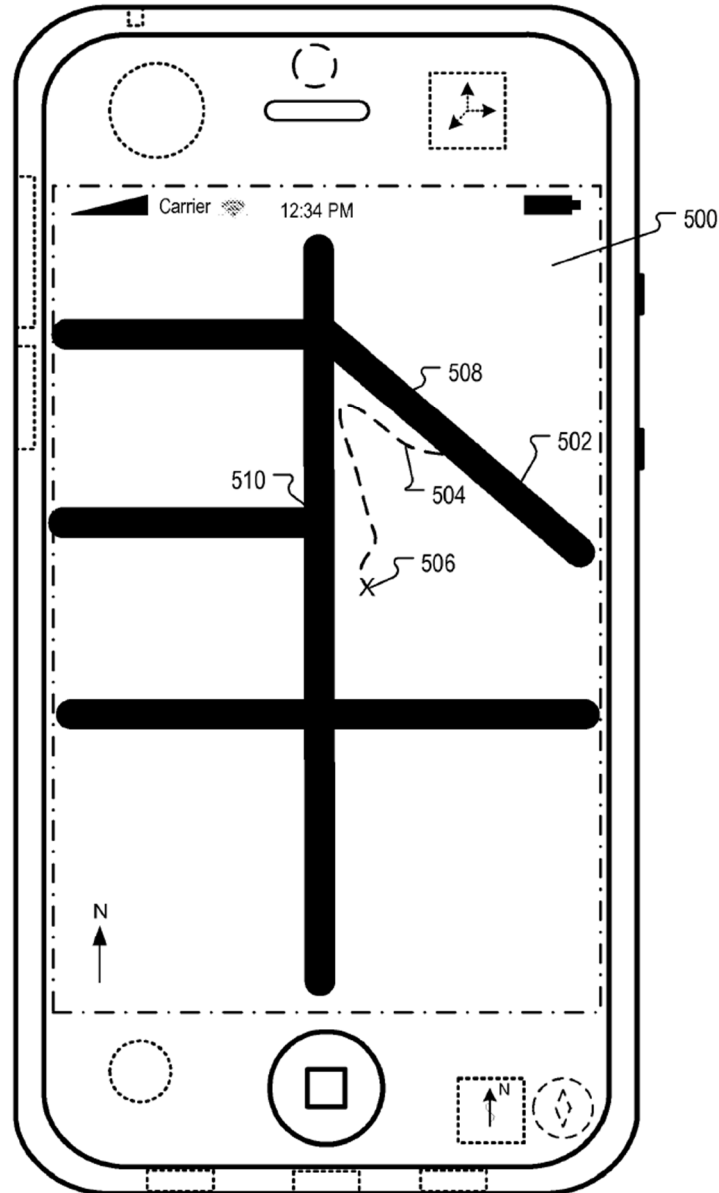
FIG. 1

USAA-1028, Fig. 1

Device 100 can be implemented as a “cellular telephone” and “smartphone,” among others. USAA-1028, [0024]. The embedded sensors used to “detect motion movement” include proximity sensor 168, ambient light sensor 170, accelerometer 172, compass 173, and gyroscope 175. *Id.*, [0036]; USAA-1003, ¶83.

Device 100 runs a navigation application that “provide[s] navigation information, e.g., map information, location information, route information, and other information.” USAA-1028, [0042]. A user accesses the navigation application by interacting with an object presented on a graphic interface. USAA-1028, [0030]-[0033]. In Figure 1, a user device “invoke[s] a map functionality, e.g., by pressing the maps object 144[.]” *Id.*, [0042]; USAA-1003, ¶84.

The navigation application provides graphical interfaces relating to vehicle navigation. Figure 5 (below) shows an exemplary map display 500 “shows a number of streets and a point of origin 'O' 502[.]” and paths “measured by the device 100 from the origin 502 to a destination” (dashed line 504, solid line 508). USAA-1028, [0072]; USAA-1003, ¶85.



USAA-1028, Fig. 5d

Device 100 can use “dead reckoning” to “measure the movement of device 100 from a point of origin or known location (a ‘fix’) to determine the device’s location relative to the fix.” USAA-1028, [0062]. In this mode, “an accelerometer reading” is used to “determine how the device [100] is positioned relative to the

earth's gravity," which enables detection of "which direction is down relative to the positioning of the device." *Id.*, [0070]; USAA-1003, ¶87.

Device 100 can also be set to different modes to adjust the use of dead reckoning functions (e.g., using accelerometer measurements for location measurement). When set to a "vehicle mode," "dead reckoning functions are active" and a "default dead reckoning mode" is used where "sudden accelerations in a positive or negative direction along the axis of the earth's gravity are given a reduced importance[.]" USAA-1028, [0064]. Another mode is "walking mode," where "a walking mode of dead reckoning position measurement" is used for location measurement, e.g., using data collected by "a footwear impact sensor" and "detecting walking motions" such as "periodic accelerations indicative of steps being taken by a user." USAA-1028, [0065], [0071]; USAA-1003, ¶¶88-89.

(b) *Langle2009*

Langle2009 is focused on using mobile devices to "aid in safe driving practices and detection of emergencies." USAA-1029, 1. Langle2009's technique uses a "Google phone" ("T-Mobile G1") to "classify safe versus unsafe driving[]" using sensor data collected by the phone, such as "[braking] distance, acceleration, and deceleration[.]" *Id.*; USAA-1003, ¶91.

Mobile phones include "embedded accelerometers" that are "used for risk

level detection while riding in a vehicle.” USAA-1029, 1. Further, “[p]rogramming with accelerometers on the Android platform is straightforward and supports three axes[,]” and thus, “[u]sing accelerometer measurements, it should be possible to classify driving habits as safe or unsafe.” *Id.* The technique “look[s] at the two horizontal axes to determine the safety level of the driver. *Id.*; USAA-1003, ¶92. Driving behaviors are evaluated to identify unsafe driving activity, such as braking and lane changing. USAA-1029, 1; USAA-1004, ¶93-94.

(c) *Forstall-Rabu-Langle2009*

(i) Forstall-Rabu

A POSITA would have been motivated to seek practical solutions relating to Forstall’s vehicle mode detection since its disclosure lacks implementation details relating to detecting a vehicle mode absent some explicit user indication. USAA-1003, ¶¶189-90; USAA-1028, Abstract, [0064]-[0071].

Those solutions are found within Rabu. USAA-1003, ¶191. Like Forstall, Rabu is focused on mode detection by a mobile device, and further teaches how mode detection improves the use of a mobile device for monitoring when used in a vehicle. The mobile device leverages a “generally conventional” accelerometer (also in Forstall’s device) to determine its orientation angle and motion status, which is used to determine if it has been docked within a moving vehicle, which enables a change in the operational mode (as opposed, for example, to being hand-

held). USAA-1013, 3:1-10, 4:21-33, 8:13-10:42, Figs. 1, 4.

A POSITA would have found obvious that determining that a mobile device is docked in a moving vehicle provides a basis for changing the operational mode to “vehicle mode,” which then enables position measurement using a “default dead reckoning mode.” USAA-1003, ¶192; USAA-1028, [0064], [0070]; USAA-1013, 3:1-10, 4:21-33, Figs. 1, 4. For example, a POSITA would have found it obvious to leverage motion and orientation data from accelerometer 172 to detect whether device should operating in “vehicle mode.” USAA-1003, ¶193; USAA-1028, [0070].

Forstall and Rabu would have also motivated a POSITA to supplement the detection of a “vehicle mode” on Forstall’s device based on user input. USAA-1028, [0064]. Forstall teaches a “navigation settings screen 400” through which a user can access a “user selectable touch-sensitive display button 402” to “toggle dead reckoning functions on or off.” *Id.*; USAA-1003, ¶194. The POSITA would have found obvious that enabling the device to automatically detect a “vehicle mode” using a docked/undocked status would introduce multiple additional advantages. *See id.*, ¶195-200.

(ii) Forstall-Rabu-Langle2009

As discussed in §III.E.1(a), Forstall describes using a navigation application running on mobile device for vehicle navigation. USAA-1028, [0004], [0030]-

[0033], [0042], [0072]. Mobile-based navigation systems were known to increase the risk of accidents since they typically involve mounting a mobile device to a vehicle dashboard so that a user may view navigation information while driving.

USAA-1003, ¶201 (citing USAA-1031, [0002]); USAA-1005, 1:3-8. This safety risk would have motivated a POSITA to venture beyond Forstall’s disclosure to well-known vehicle monitoring systems specifically concerned with safety. *Id.*

USAA-1003, ¶202 (citing USAA-1032, 323; USAA-1024, [0004]-[0008]).

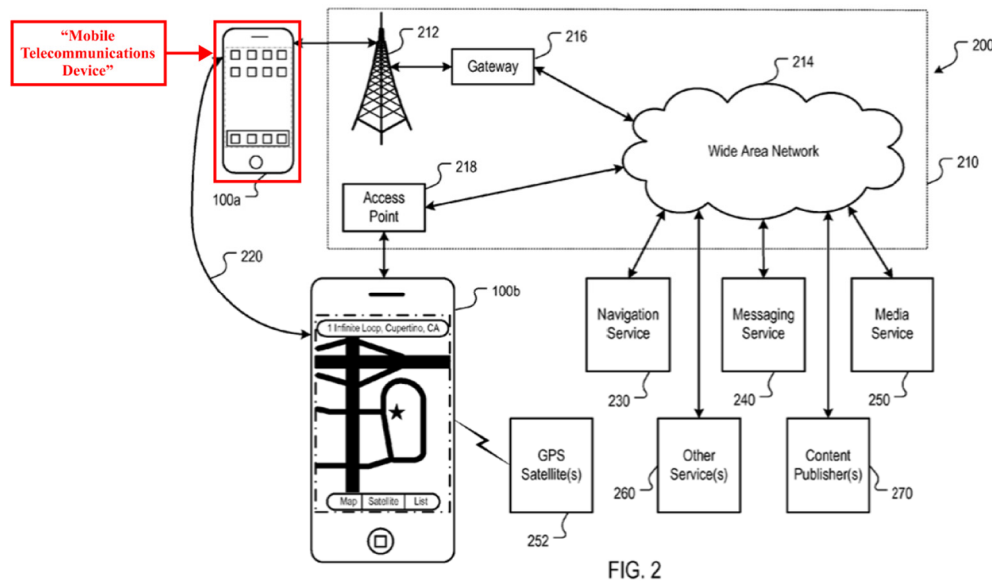
In conducting this search, a POSITA would have discovered Langle2009—a reference describing a technique to predict accident-related risks. USAA-1029, 1; USAA-1003, ¶203. Like Forstall, Langle2009’s technique utilizes embedded sensors of mobile phones, including accelerometer data and position data. *Id.*

Langle2009 teaches “mobile phones may be used to aid in safe driving practices and detection of emergencies[,]” and thus, the sensors used for improving safety are already present in Forstall’s device. USAA-1029, 1; USAA-1003, ¶203. A POSITA would have had a reasonable expectation of success in incorporating Langle2009’s safety techniques into Forstall’s mobile device since Langle2009 recognizes that “[p]rogramming with accelerometers...is straightforward and supports three axes.” USAA-1003, ¶204 (citing USAA-1032, 323-24; USAA-1031, [0014]-[0018]); USAA-1077, 3-12.

2. Claim 1

[1.1]

If the preamble is limiting, Forstall-Rabu-Langle2009 (§III.E.1(d)) renders it obvious. The Forstall-Rabu-Langle2009 device (“*mobile telecommunications device*”) can be “a cellular telephone” or “smartphone.” USAA-1028, [0024], Fig. 1⁴; USAA-1003, ¶205.



Forstall, Fig. 2 (annotated)

The device provides “adaptive mobile device navigation” where “a device position is stored in memory,” “sensor data is received from a motion sensor measuring movement of the device,” and “sensor data is compared to map data corresponding to the device location.” USAA-1028, [0006]. The Forstall-Rabu-Langle2009 device therefore logs vehicle movement (“*driving activity associated with a*

⁴ All emphasis has been added.

vehicle”). *Id.*, [0065]-[0071]; USAA-1003, ¶206.

[1.2]

The Forstall-Rabu-Langle2009 device includes at least one integrated sensor (“*sensor set*”) including accelerometer 172 (“*accelerometer*”) and compass 173 and/or gyroscope 175 (“*positioning module*”) to “measure movements of the device.” USAA-1028, [0061]; USAA-1003, ¶207.

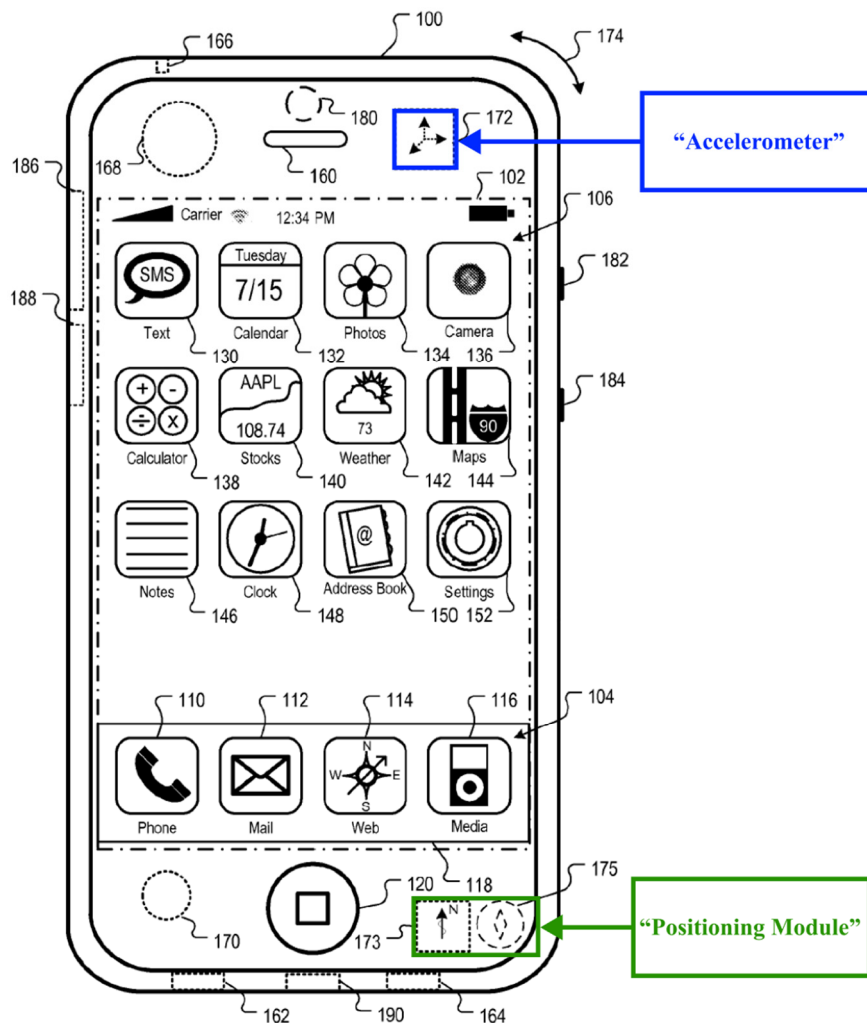


FIG. 1

Forstall, Fig. 1 (annotated)

Data from device's sensors is used to measure movement from "a point of origin or a known location[.]" USAA-1028, [0062]. The Forstall-Rabu-Langle2009 device would have processed sensor data related to movement to identify unsafe driving behaviors (e.g., unsafe acceleration, unsafe braking). USAA-1029, 1; USAA-1030, [0020]; USAA-1003, ¶208.

[1.3]

The Forstall-Rabu-Langle2009 device runs a navigation application that, for example, displays map display 500 ("*user interface*") with a path "from [an] origin 502 to a destination 510[.]" *Id.*, [0072], [0027]; USAA-1003, ¶209.

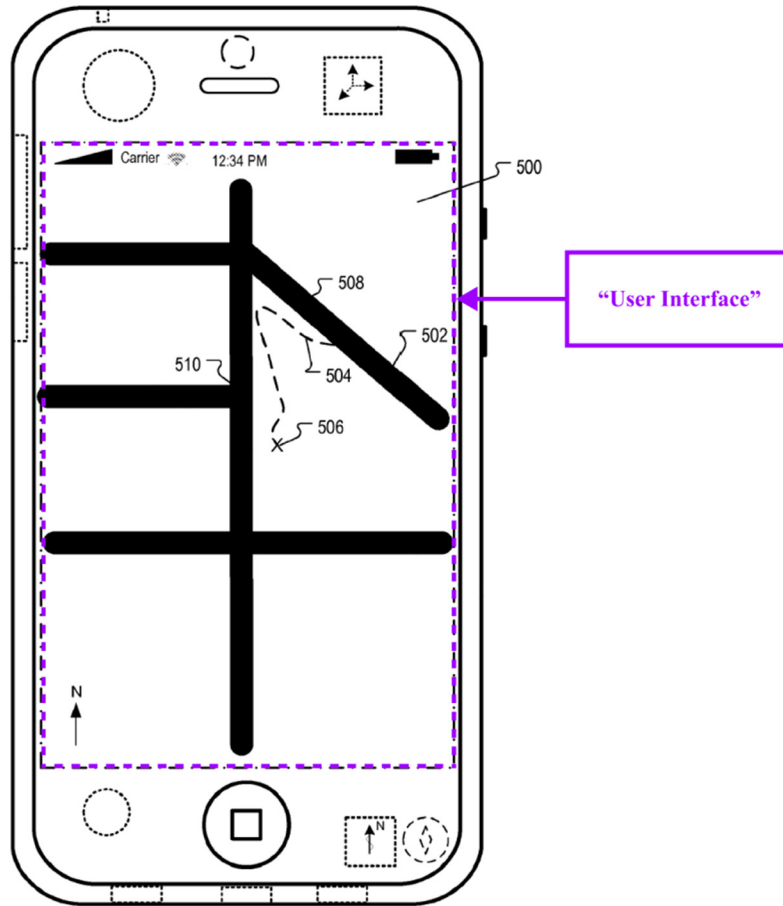


FIG. 5

USAA-1028, Fig. 5 (annotated)

[1.4]

The Forstall-Rabu-Langle2009 device includes “one or more processors” (“*processor*”) for interpreting sensor data “received from one or all of the accelerometer 172, compass 173, and/or gyroscope 175.” USAA-1028, [0074]. The one or more processors “[u]se an on board clock” to “interpret the sensor data as movement of the device 100[,]” and “determine velocity, and position[,]” and/or a direction of travel. *Id.*; USAA-1003, ¶210.

[1.5]

Forstall-Rabu-Langle2009 device includes memory (“*memory*”) for storing information relating to “adaptive mobile device navigation,” such as “device position.” USAA-1028, [0006]. For example, “memory 350” includes “high-speed random access memory and/or non-volatile memory.” *Id.*, [0055]; USAA-1003, ¶211.

Memory 350 stores instructions providing device functionality, including “graphic user interface processing,” “sensor-related processing and functions,” “phone-related processes and functions,” among others. USAA-1028, [0056]. A POSITA would have found obvious to configure memory 350 to store raw sensor data (accelerometer data, position data) and data generated from evaluating the raw sensor data (e.g., unsafe driving behaviors). USAA-1003, ¶212.

[1.6]

The Forstall-Rabu-Langle2009 device runs a navigation application to “provide directions from a point of origin to a destination” and “display[] a current position on a map as well as deliver navigation instructions based on the current position to route a user to a desired destination.” USAA-1028, [0004]. As discussed below, Forstall-Rabu-Langle2009 meets each of the requirements imposed by [1.6] of the configuration of a “mobile telecommunications device” to determine a “start of a driving period” identified in §I.C. USAA-1003, ¶213.

The start of a navigation period (“*start of a driving period*”) is determined based on a user’s interaction with map display 500 (“*inputs received by the user interface*”), for example, when a user specifies a “desired destination” (destination 506) for the map display 500 to “provide directions from a point of origin to [the] destination[.]” USAA-1028, [0004], [0072]; USAA-1003, ¶214. A user also interacts with objects displayed on a top-level interface graphical of the device to access the user interfaces specifically provided by the navigation application (e.g., map display 500). USAA-1028, [0042].

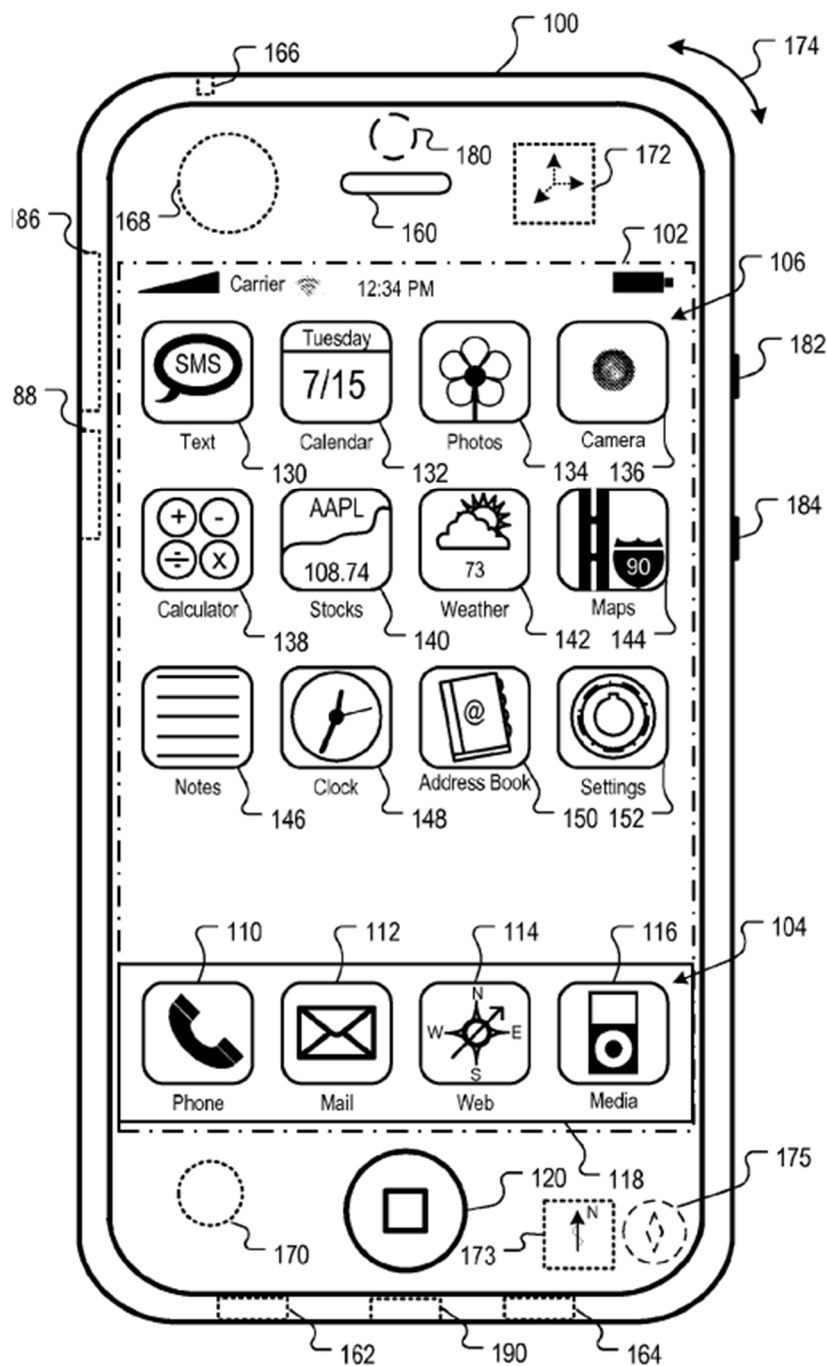
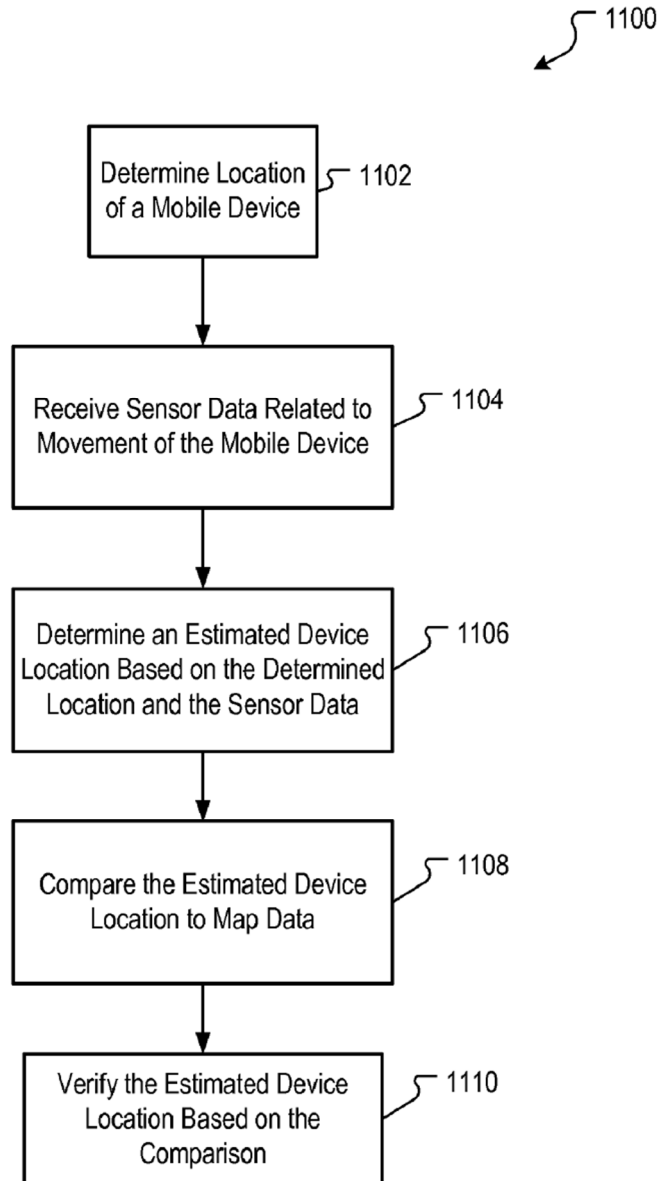


FIG. 1

USAA-1028, Fig. 1

The start of a navigation period (“*start of a driving period*”) is determined based on data collected by integrated sensors (“*sensor data from the device’s sensor set*”), e.g., when the device determines an estimated device location to set for the “point of origin” (origin 502). USAA-1028, [0072], [0082]. In Figure 11 (below), the estimated device location is determined based on sensor data received from “accelerometer 172, compass 173, gyroscope 175,” and by, for example, “performing dead reckoning calculations using the received sensor data to measure movements of the mobile device from the determined location.” *Id.*, [0073], [0082]. USAA-1003, ¶215.



USAA-1028, Fig. 11

In the example above, the start of the navigation period (“*start of a driving period*”) is based on the user’s interaction with map display 500 (“*inputs received by the user interface*”) and sensor data used to estimate device location in identifying an origin to be used for route guidance (“*sensor data from the device’s sensor*”).

set”). USAA-1003, ¶216; USAA-1028, [0004], [0042], [0072], [0073], [0082], [0083].

Moreover, Forstall-Rabu would have provided a device “mounted in a vehicle” using an “automobile dock” or “vehicle holder,” and thus, be “***removably attached to the vehicle***” prior to and/or during a navigation period where a vehicle is traveling along a navigation path (“***the vehicle is in use***”). USAA-1013, 3:11-45, Figs. 1, 2; USAA-1003, ¶217. As discussed in §III.E.1(d)(i), this would have improved the transitioning of operational modes (walking mode, vehicle mode) by detecting a “dock status” indicating attachment to “automobile dock” or “vehicle holder” (as taught in Rabu). USAA-1003, ¶217; USAA-1028, [0064], [0065], [0068], [0070], [0071]; USAA-1013, 3:1-10, 4:21-33, 8:13-10:42, Figs. 1, 4, 5, 7, 8.

[1.7]

As discussed for [1.2], the Forstall-Rabu-Langle2009 device collects sensor data related to device movement from integrated sensors (“***sensor data from the sensor set***”) while a navigation application monitors vehicle movement (“***during the driving period***”). USAA-1028, [0036], [0045], [0061]. Langle2009 describes evaluating (“***processing***”) sensor data (e.g., accelerometer measurements) to identify driving safety data indicating safe and unsafe driving behaviors (“***driving information associated with how the vehicle is driven***”). USAA-1029, 1-3; Figs. 2,

4; USAA-1003, ¶218.

[1.8]

As discussed for [1.2], a memory of Forstall-Rabu-Langle2009 device (e.g., memory 350) stores driving safety data (“***store a selection of the driving information to the memory***”). USAA-1003, ¶¶219-20; USAA-1029, 507; USAA-1028, [0055], [0056].

[1.9]⁵

As discussed for [1.7], driving safety data (“***driving information***”) is determined based on evaluating sensor data collected by integrated sensors (accelerometer 172, compass 173, gyroscope 175). USAA-1028, [0036], [0045], [0061].

Driving safety data is derived “***without data from vehicle sensors***” since Forstall and Langle2009 each teach data collection and processing techniques using only data from smartphone sensors. *Id.*, [0006], [0007], [0061]; USAA-1029, 1-2; USAA-1003, ¶221 (citing USAA-1031, [0010]).

[1.10]

The navigation application is downloaded by the Forstall-Rabu-Langle2009 device (“***downloaded application***”). USAA-1028, [0033], [0042], Fig. 5; USAA-1003, ¶222. As discussed in §III.E.1(a), the navigation application monitors location information such that the device is “***controlled***” by the navigation application

⁵ See footnote 4.

while a user accesses map data. *Id.*, [0030]-[0033], [0042]; USAA-1003, ¶222.

The Forstall-Rabu-Langle2009 device detects driving behaviors which involves “*detect[ing] occurrence of a predetermined event*” since these behaviors are among a finite number of predetermined classifications described in Langle (e.g., unsafe acceleration, unsafe braking). *Id.*; USAA-1003, ¶223; USAA-1029, 1. A POSITA would have also found it obvious that detection of an unsafe driving behaviors results in initiating access to emergency services (“*take at least one predetermined action*”). USAA-1003, ¶223 (citing USAA-1023, USAA-1046).

3. Claims 2, 12, 13

[2]

As discussed for [1.5] and [1.8], the Forstall-Rabu-Langle2009 device would have stored driving safety data (e.g., unsafe acceleration, unsafe braking) in memory (“*storing driving information...to the memory*”). USAA-1028, [0055], [0056]; USAA-1029, 6. Because stored driving safety data is evaluated to identify an unsafe acceleration (detect occurrence of an “*event*”), the stored driving safety data is “*associated with that event*.” USAA-1003, ¶224. A POSITA would have found it obvious to configure the device to initiate the start of collecting safety data in response to detecting unsafe acceleration and unsafe braking (“*predetermined event*”). USAA-1003, ¶224 (citing USAA-1029, 1).

[12]

A POSITA would have found obvious that the Forstall-Rabu-Langle2009

device includes a battery as a power source (“*utilizes its own power supply*”) since cellphones and smartphones were known by the Critical Date to include batteries.

USAA-1003, ¶225 (citing USAA-1043, 109-13); USAA-1028, [0024], [0040].

[13]

As discussed for [1.1], the Forstall-Rabu-Langle2009 device can be a “smartphone” and “can place and receive phone calls (e.g., using VoIP protocols)[.]” USAA-1028, [0024], [0040]; USAA-1003, ¶226.

F. [GROUND 2B] – Forstall-Rabu-Langle2009-Balachandran Renders Claims 3 and 4 Obvious

1. Proposed Combination

(a) *Forstall-Rabu-Langle2009-Balachandran*

A POSITA would have incorporated Balachandran’s emergency call feature into the Forstall-Rabu-Langle2009 device to prevent casualties resulting from a vehicle accident and advancing Langle2009’s motivation to reduce casualties from vehicular accidents. USAA-1003, ¶¶227-28. This would have enabled the device to provide life-saving capabilities by providing a mechanism for user to seek emergency response service while a user is travel along a navigation route. *Id.* (citing USAA-1029, 1).

2. Claims 3, 4

[3.1]

Balachandran describes sensors that detect an accident (“*event [that] has*

been detected”). USAA-1007, 2:16-27, 4:5-21. Upon detecting an accident, Balachandran’s emergency response technique involves an emergency call activation signal being transmitted to a cellphone, which initiates an emergency call after a timeout period specified by timer 35 has expired. *Id.*, Abstract, 2:46-3:6. Notifications relating to timer 35 are used to indicate an accident has been detected since the timer 35 is specifically used to initiate an emergency call relating to a detected accident. USAA-1003, ¶229. Thus, a POSITA would have found it obvious that the Forstall-Rabu-Langle2009-Balachandran device provides an audio or visual output to indicate that an accident has been detected (“*providing feedback to a user*”). *Id.* Further, in some instances, an accident is detected (and an audible or visual notification of the detected accident is provided) in response to device identifying an unsafe driving behavior (“*occurrence of a predetermined event*”). *Id.*, ¶220 (citing USAA-1029, 1).

[3.2]

A POSITA would have found it obvious to implement Balachandran’s interface 45 as a graphical user interface since Balachandran teaches that the cellphone is capable of providing a “*visual indication* [that] notifies the passengers of activation of timer” relating to an emergency call. USAA-1003, ¶231; USAA-1007, 2:16-63, 4:5-21. Thus, the Forstall-Rabu-Langle2009-Balachandran device would have received a user abort command relating to an emergency call (“*receive*

a user interaction to...deny whether the detected event has actually occurred following said feedback”)

[4.1]

As discussed for [3.1], the Forstall-Rabu-Langle2009-Balachandran device would have provided an audio or visual indication that an accident has been detected. USAA-1007, 2:46-63. Thus, the device would have notified a user that an emergency call has been scheduled (“*further action [that] has been scheduled*”) after a time period specified by a timer (the action “*will be taken with a predetermined period*”). USAA-1003, ¶232.

[4.2]

As discussed for [4.1], the Forstall-Rabu-Langle2009-Balachandran device would have received a user abort command relating to an emergency call. USAA-1006, 2:64-3:6, 4:22-31. Thus, the device would have received a user abort command (“*user interaction...to deny whether the further action should be taken*”) relating to an emergency call to be initiated (the action “*will be taken with a predetermined period*”). USAA-1003, ¶233.

G. [GROUND 2C] –Forstall-Rabu-Langle2009-Katayama Renders Claims 6-8 Obvious

1. Proposed Combination

(a) *Forstall-Rabu-Langle2009-Katayama*

Memory of the Forstall-Rabu-Langle2009 device (a mobile device) has a

finite storage capacity. A POSITA would have perceived a need to address storage constraints on the mobile device and looked to well-known data handling techniques. This supports ongoing collection and storage of sensor data in the device without necessitating impediments to data collection when the storage is full. USAA-1003, ¶234; USAA-1024, [0044]-[0046].

Katayama not only recognizes that storage constraints of mobile devices necessitate different types of storage, but further discloses a technique for transferring data to permit data preservation despite the storage constraints. USAA-1003, ¶235. A POSITA would have configured the device's memory in a similar fashion and thereby enable the memory to take advantage of Katayama's storage technique. *Id.* This configuration would have also improved the existing combination as it would have leveraged Katayama's storage technique to "eliminat[e] accumulation of useless data" (as taught in Katayama). USAA-1024, [0053].

2. Claims 6-8

[6.1]

Katayama describes a recording device 1 with an information processing device 8 ("**memory**") that includes situation data recording section 803 ("**long term memory for persistently storing driving information**") and temporary data storage section 802 ("**short term memory for transiently storing driving information**").

USAA-1024, [0044]-[0046], Fig. 5. The Forstall-Rabu-Langle2009-Katayama device would have included Katayama's situation data recording section 803 and temporary data storage section 802, thereby improving its storage capabilities by removing the need to accumulate useless data. USAA-1024, [0044]-[0046], [0053]; USAA-1003, ¶236.

[6.2]

In some scenarios, temporary data storage section 802 (“*short term memory*”) obtains situation data more frequently (“*receives...at a higher update rate*”) than situation data recording section 803 (“*long term memory*”). USAA-1024, [0044]-[0046], Fig. 5. Katayama teaches that situation data is transferred to situation data storage section 803 “[o]nly in a case that the content meets the pre-determined condition[.]” *Id.*, [0046]. Further, “[i]f a capacity of the temporary data storage section 802 runs out, old data is sequentially erased and new situation data is written in the temporary data storage section 802.” *Id.*, [0045]. In scenarios where situation data is periodically recorded but no accident is detected, old data stored in temporary data storage section 802 is more frequently erased relative to situation data being transferred to situation data storage section 803. USAA-1003, ¶237.

[6.3]

Katayama teaches that the temporary data storage section 802 records situation data (“*write driving information to the short term memory*”) at a constant sampling rate (“*at a predetermined update rate*”) and while a vehicle is monitored according to a chronological order (“*in a predetermined sequence*”). USAA-1024, [0044]-[0046], Fig. 5. Specifically, Katayama teaches “receiv[ing] the situation data...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[.]” *Id.*, [0045]; USAA-1003, ¶238.

[6.4]

Katayama describes overwriting previously collected situation data stored in temporary data storage section 802 (“*overwrite the driving information previously written to the short term memory*”) with new situation data collected according to a constant sampling rate (“*in accordance with the predetermined sequence*”). USAA-1024, [0044]-[0046], Fig. 5. Specifically, Katayama teaches “[i]f a capacity of the temporary data storage section 802 runs out, old data is sequentially erased and new situation data is written in the temporary data storage section 802.” *Id.*, [0045]; USAA-1003, ¶239.

[7.1]

As discussed for [1.10] (§III.E.2), the Forstall-Rabu-Langle2009-Katayama device would have classified driving behaviors based on sensor data, and detection

of a particular driving behavior represents “*detect occurrence of a predetermined event*.” USAA-1029, 1; USAA-1030, [0051]; USAA-1003, ¶240.

[7.2]

Katayama describes transferring situation data (“*data*”) from temporary data storage section 802 (“*short term memory*”) to situation data recording section 803 (“*long term memory*”) in response to satisfaction of predetermined conditions associated with accident detection. USAA-1024, [0046]. The conditions can relate to acceleration data, such as “whether or not the acceleration (deceleration) exceeds a predetermined judgement criterion,” or “whether or not the acceleration continues for more than or equal to a certain period[.]” *Id.*, [0048]. In circumstances where an accident is detected based on acceleration data that also satisfies a predetermined condition for transfer, the situation data is transferred from temporary data storage section 802 to situation data recording section 803 “*in response to*” the accident being detected. USAA-1003, ¶241.

[8.1]

Katayama describes a set of vehicle sensors (“*external device*”) that sense data related to “the behavior, surrounding situation, and operating condition or the like of [a] motor vehicle V” (“*external driving information associated with a condition of the vehicle*”). USAA-1024, [0034], [0064]. Examples of the vehicle sensors include “automobile speed meter 10 incorporated into the vehicle, the door 11,

the emergency brake 12 and the ignition switch 13.” *Id.*, [0064]. Thus, the Forstall-Rabu-Langle2009-Katayama device would have obtained data from vehicle sensors as this would have improved the accuracy of monitoring for unsafe driving behaviors. USAA-1003, ¶242.

[8.2]

As discussed for [8.1], Katayama describes the data used for accident detection includes “position data indicating a position of the vehicle, speed data indicating a speed of the vehicle, brake data indicating whether or not a brake of the vehicle is activated, door open/close data indicating whether a door is open or closed” (*“at least a portion of the external driving information”*). Given that Katayama teaches using data collected by external vehicle sensors to detect accidents, a POSITA would have found it obvious to configure the Forstall-Rabu-Langle2009-Katayama device would have received at least a portion of the data collected by external vehicle sensors (*“external device”*). USAA-1003, ¶243.

H. [GROUND 2D] – Forstall-Rabu-Langle2009-Warren Renders Claims 5, 9, 11 Obvious

1. Proposed Combination

(a) Warren

Warren describes calculating a “driver score” based on “monitoring vehicle operation[,]” such as “the times the vehicle is operated, the locations the vehicle is operated and the speeds or other characteristics of how the vehicle is operated[.]”

USAA-1030, Abstract. The driver score is “applied to ascertain the risk of insuring a particular driver” and “a tool for defining or adjusting the terms of an insurance policy for an insured driver.” *Id.*; USAA-1003, ¶¶95-96.

The driver score reflects “a risk level associated with insuring a particular driver[,]” (USAA-1030, [0024]) and “an insurance risk and is used to either increase or decrease an insurance premium or otherwise modify the terms of an insurance policy” (*id.*, [0026]). USAA-1003, ¶¶97-98; USAA-1030, [0024]..

(b) *Forstall-Rabu-Langle2009-Warren*

A POSITA would have found obvious from Langle2009’s disclosure that unsafe behaviors are driver-specific, and thereby looked to techniques for improving its use to improve driver safety. USAA-1003, ¶244-45; USAA-1029, 1; USAA-1044, 323. A POSITA would have found it obvious to incorporate well-known evaluation techniques to improve Langle2009’s focus on “classify[ing] driving habits as safe or unsafe.” USAA-1029, 1; USAA-1003, ¶245 (citing USAA-1030, Figs. 1-5).

A POSITA would have found obvious that incorporating Warren’s driver score into the Forstall-Rabu-Langle2009 device would have advanced—Langle2009’s overall motivation to increase the use of mobile devices “as a black box to determine varying levels of risk while riding in a vehicle.” USAA-1029, 1.

A POSITA would have also had a reasonable expectation of success in implementing the combination without invention since each reference—Forstall, Langle2009, Warren contemplates using the same type of data (accelerometer data) to monitoring driving activity. USAA-1003, ¶246 (citing USAA-1028, [0061], [0067]); USAA-1029, 1; USAA-1030, [0020]).

2. Claims 5, 9, 11

[5.1]

Warren’s central system 170 (“*remote system*”) processes data collected and/or generated for a monitored vehicle. USAA-1030, [0021]. The Forstall-Rabu-Langle2009-Warren device would have detected an unsafe acceleration from driving safety data (detect “*event*”) and provided it to central system 170 (“*communicating to a remote system that an event has been detected*”). USAA-1003, ¶247; USAA-1029, 1; USAA-1030, [0022], [0038], [0051].

[5.2]

The Forstall-Rabu-Langle2009-Warren device would have received a request from central system 170 to transmit driving safety data (“*request to transmit to the remote system selected portions of the driving information associated with the detected event*”). USAA-1003, ¶248; USAA-1030, [0022], [0023]. Further, “[c]ommunication protocol between a mobile device and a server were well known by the Critical Date,” the configuration of which were obvious design choices. See USAA-1003, ¶248; §III.A.3 (addressing [5.2]). A POSITA would have also found

it obvious to configure central system 170 to request portions of the collected safety data (“*selected portions of the driving information*”) relevant to further analysis. USAA-1003, ¶249 (citing USAA-1030, [0020], [0023]).

[9]

As discussed in §III.H.1(b), the Forstall-Rabu-Langle2009-Warren device would have determined a driver score based on driving safety data (“*driving score associated with a particular driver*”). USAA-1029; USAA-1030. In Warren, the driver score reflects “a qualitative view of the driving characteristics for a particular vehicle or a combination of a vehicle and driver[,]” such as “a risk level associated with insuring a particular driver[.]” USAA-1029, [0024]. The driver score can be based on “speeds at which the vehicle is operated.” *Id.*, [0014].

Langle2009’s driving safety data relates to risks associated with driving, and thus, the device would have computed the driver score based on processing driving safety information (e.g., unsafe acceleration, unsafe braking) (“*process the driving information to generate a driving score associated with a particular driver*”).

USAA-1003, ¶250; USAA-1029, 1-2; USAA-1030, [0014], [0024]. For example, Warren teaches embodiments where the driver score “include[s] a variety of parameters with various weights applied to the parameters[.]” and a POSITA would

have found it obvious that to determine parameter weights based on identifying unsafe driving behaviors from sensor data (as taught in Langle2009). USAA-1030, [0051].

[11]

As discussed for [5.1], Warren discloses a central system 170 (“**remote system**”) that receives data collected and/or generated for a monitored vehicle. USAA-1030, [0021]. Warren describes monitored data to central system 170 for processing (“**transmitting driving information...to a remote system**”). A vehicle monitor “periodically transmit[s] collected data to the central system 170[,]” using “wireless technology,” such as “FLEX, REFLEX, POCSAG, AMPS, NAMPS, TDMA, CDMA, GSM, GPRS[.]” *Id.*, [0022]. Forstall describes a device that includes “one or more wireless communication subsystems” (“**wireless telecommunications module**”), including “802.11b/g communication device 186, and/or a Bluetooth™ communication device 188.” USAA-1028, [0038]. Thus, the Forstall-Rabu-Langle2009-Warren device would have provided driving safety data to central system 170 using one or more wireless communication subsystems (“**transmitting driving information via a wireless telecommunication module of the mobile telecommunication device**”). USAA-1003, ¶251.

I. [GROUND 2E] – Forstall-Rabu-Langle2009-Tamir Renders Claim 10 Obvious

1. Proposed Combination

(a) *Forstall-Rabu-Langle2009-Tamir*

Incorporating Tamir's data collection technique into the combination would have improved motion recording by, for example, allowing "lower power consumption and less wear and tear of" phone 100. USAA-1006, 9:10-20, 20:52-21:11, 20:52-21:2. Moreover, "dynamic sampling rates were conventional by the Critical Date[.]" USAA-1003, ¶252 (citing USAA-1017, 5:61-6:9, 9:3-7; USAA-1018, [0019]; USAA-1019, 5:1-3).

2. Claim 10

[10]

As discussed in §III.I.1(b), the Forstall-Rabu-Langle2009-Tamir device would have used Tamir's data collection technique to use variable sampling rates and improve Forstall's data recording technique. USAA-1006, 9:10-20, 20:52-21:11. Tamir describes that "the sampling rate is adjusted according to the driving pattern of vehicle 15" and that "when it is determined that the driver is driving relatively daringly, a higher sampling rate is used." *Id.*, 20:52-21:2. Tamir also contemplates adjusting data collection "at special occasions, such as when an accident is possible." *Id.* The Forstall-Rabu-Langle2009-Tamir device would have detected an unsafe driving behavior ("**event**") using a higher sampling rate for data collection relative to other scenarios ("**driving information captured at a higher sampling rate than when an event is not detected**"). USAA-1003, ¶253. The de-

vice would have also initiated the start of collecting safety data in response to detecting unsafe acceleration and unsafe braking (“*predetermined event*”). *Id.* (citing USAA-1029, 1).

IV. PTAB DISCRETION SHOULD NOT PRECLUDE INSTITUTION

Consistent with Congressional intent, the goals of *Fintiv*, and Director Vidal’s interim guidance issued June 21, 2022 (“*Director’s Guidance*”), USAA asks the Board to consider this Petition’s challenges. IPR2020-00019, Pap. 11, 6 (PTAB Mar. 20, 2020) (precedential)(“*Fintiv*”). First, a holistic analysis of the *Fintiv* framework favors institution.⁶

Even were that not the case, the Petition presents compelling challenges premised on Dr. Michalson’s corroborated testimony which, if unrebutted at trial, would plainly lead to the conclusion that the Challenged Claims are unpatentable by a preponderance of the evidence. For at least that additional reason, “the PTAB should not discretionarily deny institution under *Fintiv*.” USAA-1065 (*Director’s*

⁶ Apart from Petitioner’s showing that the *Fintiv* factors favor institution, the *Fintiv* framework should not be followed because it is legally invalid. The framework (1) exceeds the Director’s authority, (2) is arbitrary and capricious, and (3) was adopted without notice-and-comment rulemaking.

Guidance), 3-5; IPR2022-01242 Pap. 23 at 3, 5-6 (PTAB Feb. 27, 2023)(precedential)(“*Commscope*”).

1. Factor 1

Factor 1 is at worst neutral, as neither party has yet requested a stay, and the Board “will not attempt to predict” how a district court might adjudicate a future motion to stay. *Fintiv*, 12; IPR2019-01393, Pap. 24, 7 (June 16, 2020)(“*Sand Revolution*”)(informative); IPR2020-01019, Pap. 12, 14 (PTAB Dec. 1, 2020)(“*Sotera*”)(precedential).

2. Factor 2

USAA been diligent. Telematics filed its complaint on 5/11/2022, and this Petition is being filed two months prior to the statutory bar date. IPR2020-00156, Pap. 10, 9 & n.8 (June 15, 2020) (“*Seven*”); USAA-1004.

Although the District Court—one of the busiest patent courts—has set an estimated March 2024 trial date, “scheduled trial dates are unreliable and often change.” USAA-1065 (*Director’s Guidance*), 8; USAA-1066, 5. Thus, “the proximity to trial should not alone outweigh” other relevant factors. *Id.*, 8.

Based on the 5/11/2022 filing date of the complaint and a median time-to-trial of about 28.3 months (USAA-1067, 37), jury trial can currently be expected to occur in late September 2024. Based on the 18-month IPR schedule and a typical delay in issuance of notice of filing date accorded of less than 1 month, the Board will

likely issue its Final Written Decision (“FWD”) in late September or early October 2024 (i.e., around the same time as the median-expected jury trial). USAA-1065, 9.

For at least these reasons, Factor 2 favors institution. *See* USAA-1065 (*Director’s Guidance*), 8-9.

3. Factor 3

By any objective standard, this petition is being filed at an early stage of the litigation, which “has weighed against exercising the authority to deny institution[.]” *Seven*, 11-12 (quoting *Fintiv*, 11). Indeed, the District Court has yet to expend significant resources on invalidity. *Seven*, 10-13; *Sotera*, 16-17; IPR2020-00820, Pap. 15, 11-13 (Oct. 21, 2020)(“*Snap*”)(precedential).

4. Factor 4

Though Telematics presently alleges infringement of the ’487 patent’s claims 1, 2, 3, 6, 9, 10, 11, 12, and 13, its contentions are preliminary, and thus, USAA it unable to identify the full complement of claims for which Telematicas will ultimately allege infringement. USAA-1075, 6. This Petition, however, challenges all claims of the ’487 patent. Accordingly, a material number of the Challenged Claims are likely be left unaddressed in the Litigation. *Seven*, 21.

Furthermore, to eliminate any doubt as to the absence of meaningful overlap

between the Litigation and IPR, USAA stipulates that upon institution of this Petition, USAA will not seek resolution in the District Court of any ground of invalidity utilizing any of Curry, Rabu, Balachandran, Katayama, Tamir, Forstall, Langle2009, or Warren. USAA-1074. By this stipulation, Factor 4 weighs heavily against denial of institution because, upon institution, there would be *zero overlap* between the prior art relied on in this IPR and the prior art in the parallel proceedings. *See* IPR2021-00972 Pap. 10, 13-16 (Dec. 8 2021)(“*AliveCor*”).

Indeed, the PTAB has found that preventing consideration of IPR references in this manner avoids the concerns over duplication of effort or conflicting decisions expressed by *Fintiv*. For example, in *Facebook*, the Board found that, “[b]ecause neither the references nor the grounds asserted in the Petition...will be raised in the parallel...proceeding, we determine that there is little risk of duplication of effort or conflicting decisions, and this factor weighs against exercising our discretion to deny institution.” IPR2021-00033, Pap. 13, 14 (April 30, 2021).

5. Factor 5

The Litigation involves the same parties. However, with respect to Factor 5, the *Fintiv* decision “says nothing about situations in which the petitioner is the same as, or is related to, the district court defendant.” IPR2020-00122, Pap. 15, 10 (Crumbley, dissenting); *Fintiv*, 13-14. Factor 5 is, at worst, be neutral. *Snap*, 16.

6. Factor 6

Director Vidal has explained that “the PTAB will not deny institution...under *Fintiv*...when a petition presents compelling evidence of unpatentability[.]” USAA-1065 (*Director’s Guidance*), 3-5, 9; *Fintiv*, 14-15.

The merits of this Petition are compelling. Institution would result in a finding of unpatentability and, even assuming that the District Court Litigation is thought relevant (it is not) the strength of the merits alone is enough to outweigh any inefficiencies born of parallel litigation. USAA-1065, 3-5, 9; *Fintiv*, 14-15. Further, institution would *promote* the AIA’s objectives of providing an effective and efficient alternative to district court litigation. Sen. Rep. No. 110-259 (2008); H.R. Rep. No. 112-98, pt. 1, 39-40; *Snap*, 16-19; *Commscope*, 4.

V. CONCLUSION AND FEES

The Challenged Claims are unpatentable. USAA authorizes charge of fees to Deposit Account 06-1050.

VI. MANDATORY NOTICES UNDER 37 C.F.R § 42.8(a)(1)

A. Real Party-In-Interest Under 37 C.F.R. § 42.8(b)(1)

United Services Automobile Association (“USAA”) is the real party-in-interest.

B. Related Matters Under 37 C.F.R. § 42.8(b)(2)

The ’487 Patent is the subject of a civil action, *Auto Telematics Ltd. v. United Services Automobile Association*, 6:22-cv-00474-ADA-DTG, W.D. Tex., filed May 11, 2022. USAA-1004. USAA is not aware of any other disclaimers,

reexamination certificates, or IPR petitions addressing the '487 Patent. USAA is concurrently filing a second petition challenging claims of the '487 patent in IPR2023-00519.

C. Lead And Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3)

USAA provides the following designation of counsel.

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D. Service Information

Please address all correspondence and service to the address listed above.

Petitioner consents to electronic service by email at IPR36137-0025IP1@fr.com

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Respectfully submitted,

Dated March 17, 2023

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CERTIFICATION UNDER 37 CFR § 42.24

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Petition for *Inter Partes* Review totals 13,923 words, which is less than the 14,000 allowed under 37 CFR § 42.24.

Dated March 17, 2023

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR §§ 42.6(e)(4)(i) *et seq.* and 42.105(b), the undersigned certifies that on March 17, 2023, a complete and entire copy of this Petition for *In-ter Partes* Review and all supporting exhibits were provided by Federal Express, to the Patent Owner, by serving the correspondence address of record as follows:

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