

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Andrew William Wright
U.S. Patent No.: 12,236,728 Attorney Docket No.: 36137-0034IP1
Issue Date: February 25, 2025
Appl. Serial No.: 18/676,284
Filing Date: May 28, 2024
Title: METHOD AND SYSTEM FOR LOGGING VEHICLE
BEHAVIOUR

Mail Stop Patent Board

Patent Trial and Appeal Board
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

PETITION FOR *INTER PARTES* REVIEW OF
UNITED STATES PATENT NO. 12,236,728

TABLE OF CONTENTS

I.	REQUIREMENTS	2
A.	Standing	2
B.	Challenge and Relief Requested.....	3
C.	Claim Construction	3
II.	THE '728 PATENT	4
A.	Specification	4
B.	Prosecution History.....	4
III.	UNPATENTABILITY	5
A.	[GROUND 1] – Callopy-Curry-Thompson Renders Claims 1-4 Obvious 5	
1.	Proposed Combination	5
2.	Claims 1-4	18
B.	[GROUND 2] – Callopy-Curry-Thompson-Warren Renders Claim 5 Obvious	47
1.	Proposed Combination	47
2.	Claim 5	52
C.	[GROUND 3] – Callopy-Curry-Thompson-Katayama Makes Claims 6- 28 Obvious	53
1.	Proposed Combination	53
2.	Claims 6-28	62
IV.	DISCRETIONARY DENIAL	77
A.	§325(d).....	77
V.	CONCLUSION AND FEES	80
VI.	MANDATORY NOTICES UNDER 37 C.F.R § 42.8(a)(1).....	80
A.	Real Party-In-Interest Under 37 C.F.R. § 42.8(b)(1).....	80
B.	Related Matters Under 37 C.F.R. § 42.8(b)(2).....	80
C.	Lead And Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3).....	81
D.	Service Information	82

EXHIBITS

USAA-1001	U.S. Patent No. 12,236,728 to Wright (“the ’728 patent”)
USAA-1002	Excerpts from the Prosecution History of the ’728 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 2010/062899 (“Callopy”)
USAA-1006	International Publication No. WO 2010/042545 to Curry et. al (“Curry”)
USAA-1007	Thompson et al., “Using Smartphones and Wireless Mobile Sensor Networks to Detect Car Accidents and Provide Situational Awareness to Emergency Responders,” <i>Mobilware</i> 2010, LNICST 48, pp. 29–42, 2010 (“Thompson”)
USAA-1008	U.S. Pat. Publication No. 2006/0053038 to Warren et al. (“Warren”)
USAA-1009	European Pat. App. Pub. No. EP 1,914,691 to Katayama et al. (“Katayama”)
USAA-1010	U.S. Pat. No. 8,682,399 to Rabu (“Rabu”)
USAA-1011-1020	RESERVED
USAA-1021	U.S. Pat. App. Pub. No. 2002/0105423 to Rast (“Rast”)
USAA-1022	U.S. Pat. App. Pub. No. 2009/0192705 to Golding (“Golding”)
USAA-1023	Internet Archive of iPhone User Guide

USAA-1024	Internet Archive of iPhone 3G Technical Specification
USAA-1025	Internet Archive of iPhone User Guide for iPhone and iPhone 3G
USAA-1026	Internet Archive of Instruction Sheet for iPhone 3G
USAA-1027	Zhao, Yilin, “Vehicle Location and Navigation Systems,” Artech House, Boston (1997) (“Zhao1997”)
USAA-1028	Conover, Gerald D, “ITS Technology in Automotive—Who's on First?” SAE International (2006): 1-11 (“Conover2006”)
USAA-1029	Skog, Isaac, et. al, “A versatile PC-based platform for inertial navigation,” Proceedings of the 7th Nordic Signal Processing Symposium-NORSIG 2006. IEEE, 2006 (“Skog2006”)
USAA-1030	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-1031	Work, D. B. & Bayen, A. M. B., “Impacts of the mobile internet on transportation cyberphysical systems: traffic monitoring using smartphones,” National Workshop for Research on High-Confidence Transportation Cyber-Physical Systems: Automotive, Aviation, & Rail. 2008 (“Work2008”)
USAA-1032	Flinchbaugh, B., “Smart Camera Systems Technology Roadmap,” Real-Time Vision for Human-Computer Interaction (2005), 285-297 (“Flinchbaugh2005”)
USAA-1033	LeBlanc, David J., “Road departure crash warning system field operational test: methodology and results,” Vol. 1: Technical Report, University of Michigan, Ann Arbor, Transportation Research Institute, 2006 (“LeBlanc2006”)

- USAA-1034 Reddy, Sasank et al., “Determining transportation mode on mobile phones,” 2008 12th IEEE international symposium on wearable computers. IEEE, 2008 (“Reddy2008”)
- USAA-1035 Zhao, Yilin, “Standardization of mobile phone positioning for 3G systems,” IEEE Communications magazine 40.7 (2002): 108-116 (“Zhao2002B”)
- USAA-1036 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-1037 Schott, Christian, et al., “CMOS single-chip electronic compass with microcontroller,” IEEE Journal of Solid-State Circuits 42.12 (2007): 2923-2933 (“Schott2007”)
- USAA-1038 Liutkauskas, V. et al., “Location based services,” Elektronika ir elektrotechnika 52.3 (2004) (“Liutkauskas2004”)
- USAA-1039 Ealey, Lance & Luis Troyano-Bermúdez, “Are automobiles the next commodity?” The McKinsey Quarterly 4 (1996): 62 (“Ealey1996”)
- USAA-1040 Zhao, Yilin, “Efficient and reliable data transmission for cellular-and-GPS-based mayday systems,” Proceedings of Conference on Intelligent Transportation Systems, IEEE, 1998 (“Zhao1998B”)
- USAA-1041 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”)
- USAA-1042 De Fabritiis, Corrado et al., “Traffic estimation and prediction based on real time floating car data,” 2008 11th international

IEEE conference on intelligent transportation systems, IEEE, 2008 (“DeFabritiis2008”)

- USAA-1043 Schäfer, Ralf-Peter, et al., “A traffic information system by means of real-time floating-car data” (2002) (“Schäfer2002”)
- USAA-1044 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”)
- USAA-1045 Leduc, Guillaume, “Road traffic data: Collection methods and applications,” Working Papers on Energy, Transport and Climate Change 1.55 (2008): 1-55 (“Leduc2008”)
- USAA-1046 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-1047 RESERVED
- USAA-1048 Excerpts of The New Oxford American Dictionary, Second Edition (2005)
- USAA-1049 Lee, Suzanne et al., “A Comprehensive Examination of Naturalistic Lane-Changes,” DOT HS 809 702, National Highway Traffic Safety Administration (March 2004) (USAA-1049)
- USAA-1050 Turner, S. & Holdener D., “Probe Vehicle Sample Sizes for Real-Time Information: The Houston Experience,” IEEE (1995)
- USAA-1051 Order in *Auto Telematics Ltd. v. United Services Automobile Association*, Case No. 2025-1209 (Fed. Cir. Mar. 4, 2025)

LISTING OF CHALLENGED CLAIMS

Claim	Identifier	Claim Language
1	[1.1]	A data-logging system configured to monitor how safely a vehicle is being driven by a driver throughout a driving period and to log, during the driving period, driving information representing movement of the vehicle whilst the vehicle is being driven by the driver, the data-logging system comprising:
	[1.2]	a remote data-logging server;
	[1.3]	a mobile telecommunications device including a user interface, a processor, a memory, and a sensor set comprising at least an accelerometer and a positioning module; and
	[1.4]	an application comprising computer-executable instructions downloaded onto the memory, wherein the computer-executable instructions, when executed by the processor, cause the mobile telecommunications device to:
	[1.5]	process, using the processor, raw sensor data representing at least acceleration of the vehicle and position of the vehicle from the sensor set to generate derived driving information representing how safely the vehicle is being driven by the driver throughout the driving period,
	[1.6]	wherein the driving period is defined by a duration of a vehicle journey, and the derived driving information includes a driving score, and
	[1.7]	wherein the processing of the raw sensor data, by the processor, includes determining a driving incident occurring within the driving period by comparing the raw sensor data against at least one predetermined threshold value and detecting the driving incident when the raw sensor data exceeds the at least one predetermined threshold, the driving incident including at least one of harsh braking, harsh acceleration, harsh swerving or a vehicle accident;

Claim	Identifier	Claim Language
	[1.8]	generate the derived driving information without data from vehicle sensors throughout the driving period in which the mobile telecommunications device is within the vehicle and the vehicle is being driven by the driver; and
	[1.9]	transmit at least some of the derived driving information including the driving incident to the remote data-logging server,
	[1.10]	wherein the remote data-logging server is configured to log the at least some of the derived driving information received from the mobile telecommunications device
	[1.11]	[the data-logging server] comprises: a database for storing a plurality of accounts, at least one of the plurality of accounts having a unique identifier, and the database being configured to store the selection of the derived driving information transmitted from the mobile telecommunications device to the at least one account, the derived driving information being associated by the unique identifier to the vehicle and the driver; and
	[1.12]	a communications interface configured to communicate with the mobile telecommunications device and receive therefrom:
	[1.13]	the unique identifier for association of the mobile telecommunications device with the at least one of the plurality of accounts; and
	[1.14]	the at least some of the derived driving information transmitted from the mobile telecommunications device to be logged to the at least one of the plurality of accounts.
2	[2.1]	The data-logging system of claim 1, wherein execution of the computer-executable instructions by the processor further causes the mobile telecommunications device to: store the raw sensor data relating to the driving incident; and

Claim	Identifier	Claim Language
	[2.2]	transmit the stored raw sensor data to the remote data-logging server.
3	[3]	The data-logging system of claim 2, wherein execution of the computer-executable instructions by the processor further causes the mobile telecommunications device to store the raw sensor data generated before, during, and after the driving incident that is continuously collected, associated with the driving incident.
4	[4]	The data-logging system of claim 1, wherein execution of the computer-executable instructions by the processor further causes the mobile telecommunications device to register a start of the driving period in response to an initialization input generated automatically in response to the raw sensor data having predetermined values.
5	[5]	The data logging system of claim 1, wherein the remote data-logging server is further configured to process the derived driving information logged to the at least one of the plurality of accounts over a plurality of driving periods, including the driving period, to generate an aggregated driving score used to determine a risk profile for at least one of the vehicle and the driver.
6	[6.1]	The data logging system of claim 1, wherein the driving period comprises a plurality of portions of time throughout the driving period, and
	[6.2]	the execution of the computer executable instructions by the processor further causes the processor to select a portion of time related to the driving incident from the plurality of portions of time for transmission to the remote logging server and to reduce the amount of data transmitted by transmitting raw sensor data relating to the selected portion of time to the remote data logging server.
7	[7]	The data-logging system of claim 6, wherein the driving incident, determined by the processor, is defined by a marked variation in a change of the raw sensor data over at least a portion of the plurality of portions of time

Claim	Identifier	Claim Language
		during the driving period indicative of a difference in a state of motion of the vehicle occurring over the at least a portion of the plurality of portions.
8	[8]	The data-logging system of claim 7, wherein execution of the computer-executable instructions by the processor further causes the mobile telecommunications device to select, prior to transmitting the derived driving information, the raw sensor data relating to the driving incident.
9	[9]	The data-logging system of claim 8, wherein, to select the raw sensor data relating to the driving incident, execution of the computer-executable instructions by the processor further cause the mobile telecommunications device to select the raw sensor data generated before, during, and after the driving incident.
10	[10]	The data-logging system of claim 9, wherein execution of the computer-executable instructions by the processor further causes the mobile telecommunications device to transmit the selected raw sensor data to the remote data-logging server.
11	[11]	The data-logging system of claim 7, wherein the at least a portion of the plurality of portions comprises a five-minute time period.
12	[12]	The data logging system of claim 6, wherein the remote-logging server is configured to store the raw data relating to the selected portion of time related to the driving incident to the at least one account.
13	[13.1]	A data-logging system configured to monitor how safely a vehicle is being driven by a driver throughout a driving period and to log driving information representing movement of the vehicle whilst the vehicle is being driven by the driver during the driving period, the data-logging system comprising:
	[13.2]	a remote data-logging server;

Claim	Identifier	Claim Language
	[13.3]	a mobile telecommunications device including a user interface, a processor, a memory, and a sensor set comprising at least an accelerometer and a positioning module; and
	[13.4]	an application comprising computer-executable instructions downloaded onto the memory, wherein the computer-executable instructions, when executed by the processor, cause the mobile telecommunications device to:
	[13.5]	process, using the processor, raw sensor data from the sensor set representing at least acceleration of the vehicle and position of the vehicle, to generate derived driving information representing how safely the vehicle is being driven by the driver throughout the driving period,
	[13.6]	wherein the driving period is defined by a duration of a vehicle journey comprising a plurality of portions of time, and
	[13.7]	wherein processing of the raw sensor data, by the processor, includes determining a driving incident occurring within the driving period by comparing the raw sensor data against at least one predetermined threshold value and detecting the driving incident when the raw sensor data exceeds the at least one predetermined threshold, the driving incident including at least one of harsh breaking, harsh acceleration, harsh swerving or a vehicle accident;
	[13.8]	generate the derived driving information without data from vehicle sensors during throughout the driving period in which the mobile telecommunications device is within the vehicle and the vehicle is being driven by the driver; and
	[13.9]	transmit at least some of the derived driving information including the driving incident to the remote data-logging server;

Claim	Identifier	Claim Language
	[13.10]	wherein the remote data-logging server is configured to log at least some of the derived driving information, including the driving incident, received from the mobile telecommunications device and
	[13.11]	[the remote data-logging server] comprises: a database for storing a plurality of accounts, at least one of the plurality of accounts having a unique identifier, and the database being configured to store the selection of the derived driving information, associated by the unique identifier to the vehicle and the driver, to the at least one account; and
	[13.12]	a communications interface configured to communicate with the mobile telecommunications device, and receive therefrom:
	[13.13]	the unique identifier for association of the mobile telecommunications device with the at least one of the plurality of accounts; and
	[13.14]	the derived driving information transmitted from the mobile telecommunications device to be logged to the at least one of the plurality of accounts, and
	[13.15]	wherein the remote data-logging server is further configured to process the derived driving information logged to the at least one of the plurality of accounts to determine a risk profile for at least one of the vehicle and driver.
14	[14]	The data-logging system of claim 13, wherein the at least one driving incident is defined by an occurrence of the sensor data exceeding a predetermined value during the driving period.
15	[15.1]	The data-logging system of claim 14, wherein execution of the computer-executable instructions by the processor further causes the mobile telecommunications device to: store the raw sensor data relating to the at least one driving incident; and

Claim	Identifier	Claim Language
	[15.2]	transmit the stored raw sensor data to the remote data-logging server.
16	[16]	The data-logging system of claim 15, wherein execution of the computer-executable instructions by the processor further causes the mobile telecommunications device to store the raw sensor data generated before, during, and after the at least one driving incident.
17	[17]	The data-logging system of claim 13, wherein execution of the computer-executable instructions by the processor further causes the mobile telecommunications device to determine the at least one driving incident as a marked variation in a change of the raw sensor data over at least a portion of the plurality of portions of time during the driving period indicative of a difference in a state of motion of the vehicle occurring over the at least a portion of the plurality of portions.
18	[18]	The data-logging system of claim 17, wherein execution of the computer-executable instructions by the processor further causes the mobile telecommunications device to select, prior to transmitting the selection of the derived driving information, the raw sensor data relating to the at least one driving incident.
19	[19]	The data-logging system of claim 18, wherein to select the raw sensor data relating to the at least one driving incident, execution of the computer-executable instructions by the processor further causes the mobile telecommunications device to select the raw sensor data generated before, during, and after the at least one driving incident.
20	[20]	The data-logging system of claim 19, wherein execution of the computer-executable instructions by the processor further causes the mobile telecommunications device to transmit the selected raw sensor data to the remote data-logging server.
21	[21]	The data-logging system of claim 13, wherein the sensor set further comprises an image sensor.

Claim	Identifier	Claim Language
22	[22]	The data-logging system of claim 13, wherein the driving information further comprises one or more of velocity, direction of travel, an indication of exceeding a velocity limit, or data representing jerky steering.
23	[23]	The data-logging system of claim 13, wherein execution of the computer-executable instructions by the processor further causes the mobile telecommunications device to register the start of the driving period in response to an initialization input generated automatically in response to the raw sensor data having predetermined values.
24	[24.1]	A data-logging system configured to monitor how safely a vehicle is being driven by a driver throughout a driving period and to log driving information representing movement of the vehicle whilst the vehicle is being driven by the driver during the driving period, the data-logging system comprising:
	[24.2]	a remote data-logging server;
	[24.3]	a mobile telecommunications device including a user interface, a processor, a memory, and a sensor set comprising at least an accelerometer and a positioning module;
	[24.4]	an application comprising computer-executable instructions downloaded onto the memory, wherein the computer-executable instructions, when executed by the processor, cause the mobile telecommunications device to:
	[24.5]	process, using the processor, raw sensor data from the sensor set representing at least acceleration of the vehicle and position of the vehicle, to generate derived driving information representing how safely the vehicle is being driven by the driver during throughout the driving period,
	[24.6]	wherein the driving period is defined by a duration of a vehicle journey comprising a plurality of portions of time, and

Claim	Identifier	Claim Language
	[24.7]	wherein the driving information includes at least one driving incident, the at least one driving incident being determined by the processor establishing by an occurrence of the raw sensor data exceeding a predetermined value during the driving period, the driving incident including at least one of harsh braking, harsh acceleration, harsh swerving, or a vehicle accident;
	[24.8]	generate the derived driving information without data from vehicle sensors during throughout the driving period in which the mobile telecommunications device is within the vehicle and the vehicle is being driven by the driver;
	[24.9]	store the raw sensor data relating to the at least one driving incident; and
	[24.10]	transmit at least some of the derived driving information, including the at least one driving incident, and the stored raw sensor data corresponding to the at least one driving incident;
	[24.11]	wherein the remote data-logging server is configured to log the derived driving information and the raw sensor data received from the mobile telecommunications device and
	[24.12]	[the data-logging server] comprises: a database for storing a plurality of accounts, at least one of the plurality of accounts having a unique identifier and the database being configured to store the at least some selection of the derived driving information associated by the unique identifier to the vehicle and the driver, and the raw sensor data, to the at least one of the plurality of accounts;
	[24.13]	a communications interface configured to communicate with the mobile telecommunications device, and receive therefrom:

Claim	Identifier	Claim Language
	[24.14]	the unique identifier for association of the mobile telecommunications device with the at least one of the plurality of accounts; and
	[24.15]	the at least some the derived driving information and the raw sensor data to be logged to the at least one of the plurality of accounts,
	[24.16]	wherein the remote data-logging server is further configured to process the derived driving information and the raw sensor data logged to the at least one of the plurality of accounts to determine a risk profile for at least one of the vehicle and driver.
25	[25.1]	A mobile telecommunications device configured to log driving information associated with how safely a vehicle is being driven, the mobile telecommunications device comprising:
	[25.2]	a sensor set comprising at least an accelerometer and a positioning module;
	[25.3]	a processor;
	[25.4]	a memory; and
	[25.5]	an application comprising computer-executable instructions downloaded onto the memory, wherein the computer-executable instructions, when executed by the processor, cause the mobile telecommunications device to:
	[25.6]	determine, based on the raw sensor data from the sensor set, a start of a driving period at which the mobile telecommunications device is within the vehicle and the vehicle is in use,
	[25.7]	wherein the driving period is defined by a duration from a start to an end of a vehicle journey and the duration is comprised of a plurality of portions of time;
	[25.8]	process, using the processor, the raw sensor data from the sensor set representing at least acceleration of the vehicle and position of the vehicle throughout the

Claim	Identifier	Claim Language
		driving period to derive driving information associated with how safely the vehicle is driven by the driver, the driving information representing movement of the vehicle whilst the vehicle is being driven by the driver throughout the driving period,
	[25.9]	wherein the processing of the raw sensor data, by the processor, includes determining a driving incident occurring within the driving period by comparing the raw sensor data against at least one predetermined threshold value, and detecting the driving incident when the raw sensor data exceeds the at least one predetermined threshold, the driving incident including at least one of harsh braking, harsh acceleration, harsh swerving or a vehicle accident;
	[25.10]	wherein the driving information is derived without data from vehicle sensors throughout the driving period and wherein the selection is determined by identifying a portion of the plurality of portions of time;
	[25.11]	transmit at least some of the derived driving information including the driving incident to a remote data-logging server; and
	[25.12]	wherein the mobile telecommunications device is controlled by a downloaded application to register the start of the driving period in response to an initialization input generated automatically in response to the sensor data having a predetermined start value.
26	[26]	The mobile telecommunications device of claim 25, wherein execution of the computer-executable instructions by the processor further causes the mobile telecommunications device to detect the end of the driving period in response to an ending input generated automatically in response to the raw sensor data having a predetermined end value.
27	[27.1]	The mobile telecommunications device of claim 25, wherein the driving period comprises a plurality of portions of time throughout the driving period, and

Claim	Identifier	Claim Language
	[27.2]	the execution of the computer executable instructions by the processor further causes the processor to select a portion of time related to the driving incident from the plurality of portions of time for transmission to the remote logging server and to reduce the amount of data transmitted by transmitting raw sensor data relating to the selected portion of time to the remote data logging server.
28	[28]	The mobile telecommunications device of claim 25, wherein execution of the computer-executable instructions by the processor further causes the mobile telecommunications device to determine the at least one driving incident as a marked variation in a change of the raw sensor data over at least a portion of the plurality of portions of time during the driving period indicative of a difference in a state of motion of the vehicle occurring over the at least a portion of the plurality of portions.

United Services Automobile Association (“Petitioner,” “USAA”) petitions for *Inter Partes* Review (“IPR”) of claims 1-28 (“Challenged Claims”) of U.S. Patent No. 12,236,728 (“the ’728 patent”).

The Challenged Claims represent efforts by Patent Owner, Auto Telematics (“AT”), to distinguish prior art that the Board already found sufficient to satisfy similar claim features of four related patents. *See, e.g.*, IPR2023-00518, Pap. 30 (PTAB Sep. 17, 2024); IPR2023-00768, Pap. 28 (PTAB Nov. 5, 2024); IPR2023-00857, Pap. 29 (PTAB Nov. 25, 2024); IPR2023-00911, Pap. 28 (PTAB Nov. 25, 2024). In its Final Written Decisions (FWDs), Board not only found *all claims* unpatentable, but reached this finding upon consideration of each of the five prior art references applied in this petition (Callopy, Curry, Thompson, Warren, Katayama). The rationales of these FWDs are thus applicable to various features recited in the Challenged Claims. While AT appealed only the FWD in IPR2023-00518, that appeal has been dismissed by the Federal Circuit. *See* USAA-1051. The FWDs therefore stand without any pending appeal.

As to new claim features, AT’s drafting efforts with regards to the ’728 patent are also unsuccessful. As explained in §III, *infra*, the Challenged Claims include language for the ***driving period***¹ element that appear to track AT’s

¹ Reference to claim language is bolded and italicized throughout.

positions in prior IPRs. In IPR2023-00518, AT unsuccessfully argued that the phrase “driving period” required “the entire period in which the vehicle is being driven.” Pap. 18, 34. Despite using different language, the Challenge Claims are similar to the claims at-issue in IPR2023-00518 in that they do not “go further to expressly dictate that the driving period encompasses the entire time a vehicle is in use.” Pap. 30, 10. Indeed, to the extent the claims identify any defining attribute for the *driving period*, it is with respect to a *duration of a vehicle journey*. See [1.6], *infra*. But, as discussed below, there is no express requirement regarding timing restrictions associated with either the “duration” or the “vehicle journey.” Declaration testimony from Dr. William Michalson² (USAA-1003) further demonstrates that a person of ordinary skill in the art (POSITA)³ would not have interpreted the claim language to limit claim scope to the entire period of driving. USAA-1003, ¶¶61-77; see USAA-1048, 4, 6, 7.

I. REQUIREMENTS

A. Standing

USAA certifies that the '728 patent is available for IPR. USAA is not

² Dr. Michalson is a professor in Robotics Engineering at the Worcester Polytechnic Institute.

³ See USAA-1003, ¶¶14-15 (defining “POSITA”).

barred or estopped from requesting this review challenging the Challenged Claims on the grounds identified below.

B. Challenge and Relief Requested

USAA requests IPR and cancellation of the Challenged Claims on the grounds below.

Ground	Claim(s)	35 U.S.C. § 103
1	1-4	§103: Callopy, Curry, Thompson
2	5	§103: Callopy, Curry, Thompson, Warren
3	6-28	§103: Callopy, Curry, Thompson, Katayama

The '728 patent was filed 5/28/2024, 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 the alleged date. USAA-1003, ¶¶16-19. The applied references are prior art:

Reference	Date(s)	Basis
Callopy	3/6/2010	§102(e)
Curry	4/15/2010	§102(a)
Thompson	July 2010	§102(a)
Warren	3/9/2006	§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-1003, ¶¶61-77.

II. THE '728 PATENT

A. Specification

The '728 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 event such as an accident,” “modify driver behavior,” or “determine insurance premiums.” *Id.*, 1:27-35; USAA-1003, ¶¶45-48. These techniques were conventional by the Critical Date. *See* USAA-1003, ¶¶20-44 (technology overview). Even the '728 patent acknowledges that “data logging devices that can be retrofitted to road conditions” are “known in the art.” *Id.*, 1:51-60.

B. Prosecution History

During prosecution, the Examiner rejected the claims over U.S. Pub. No.

2010/0131304 (“Collopy”).⁴ USAA-1002, 231-63. This petition addresses claim features using new prior art combinations of references that were not included in a ground of rejection during original prosecution. USAA-1003, ¶¶50-57.

III. UNPATENTABILITY

A. [GROUND 1] – Callopy-Curry-Thompson Renders Claims 1-4 Obvious

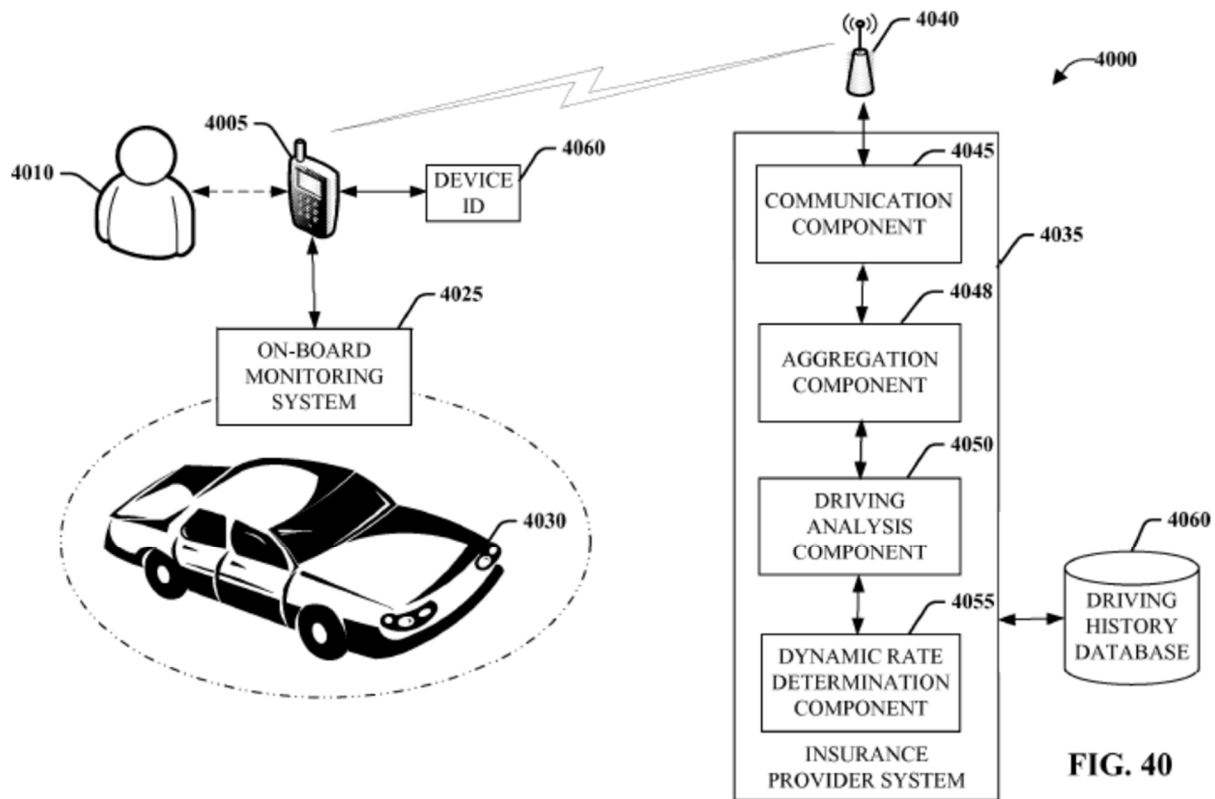
1. Proposed Combination

a) Callopy

Callopy describes providing dynamic insurance rate determinations to a driver based on collected driving data. USAA-1005, Abstract, [0017]-[0018], [0314]-[0316], FIGS. 40-42. It explains that “data can be gathered while a vehicle is in operation” using sensors (GPS, accelerometer) in a mobile device. *Id.*, [0165], [0321]-[0323]. Insurance offers based on the gathered information can be presented to the driver through an interface. *Id.*, [0024], [0314]-[0316], [0165]; USAA-1003, ¶78.

⁴ As explained in §IV.A, *infra*, the grounds based on Callopy (USAA-1004) do not involve the same or substantially same art or arguments previously presented during original prosecution. Collopy and Callopy do not have the same disclosures, and this Petition applies references that were not applied by the examiner in any rejection of the claims.

Figure 40 shows “a system for real-time monitoring of a driver to facilitate determination of insurance rates(s).” USAA-1005, [0085], [0307]. The system 4000 includes a mobile device 4005 (with GPS 4110 and accelerometer 4120), on-board monitoring system 4025, and a vehicle 4030, where mobile device 4005 wirelessly communicates with insurance provider system 4035. *Id.*, [0307], [0323]-[0324]; USAA-1003, ¶79.



USAA-1005, FIG. 40

The mobile device 4005 “monitors and gathers information regarding driver 4010’s driving skills, habits, etc. and forwards the information to the insurance provider 4035” and wirelessly communicates with an “insurance provider system

4035 via a transceiver 4040 and a communication component 4045.” USAA-1005, [0307]. Further, the Callopy system allows for driver identification and authentication using a “unique identifier,” which is associated with mobile device 4005 and stored in system 4035’s database. *Id.*, [0334], FIG. 42; USAA-1003, ¶80.

b) 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-1006, Abstract, 2:1-27,⁵ 3:24-4:11, 7:5-22, Fig. 1. USAA-1003, ¶81.

Curry’s Figure 1 (below) shows an exemplary system including a driving safety data server 104 in wireless communication with a “mobile phone” 106, which “can include any type of electronic mobile computing device that may be used while traveling in a vehicle.” USAA-1006, 7:23-26; *see id.*, 8:21-27. A client application 110, which can be downloaded “from the server 104 to the mobile phone 106,” enables phone 106 to monitor vehicle movement (e.g., evaluating “location, speed, and acceleration data” from an embedded “GPS sensor

⁵ Citations refer to PDF pages of USAA-1006.

114 and accelerometer 116”) and determine whether the vehicle is being driven.

USAA-1006, 8:21-9:3. Client 110 also monitors phone usage (e.g., texting/calling while driving) and other unsafe driving behaviors (e.g., “speeding, abnormal acceleration, abnormal deceleration, and taking sharp turns”). USAA-1006, 3:24-4:6; *id.*, 7:5-22, 8:30-9:33; USAA-1003, ¶82.

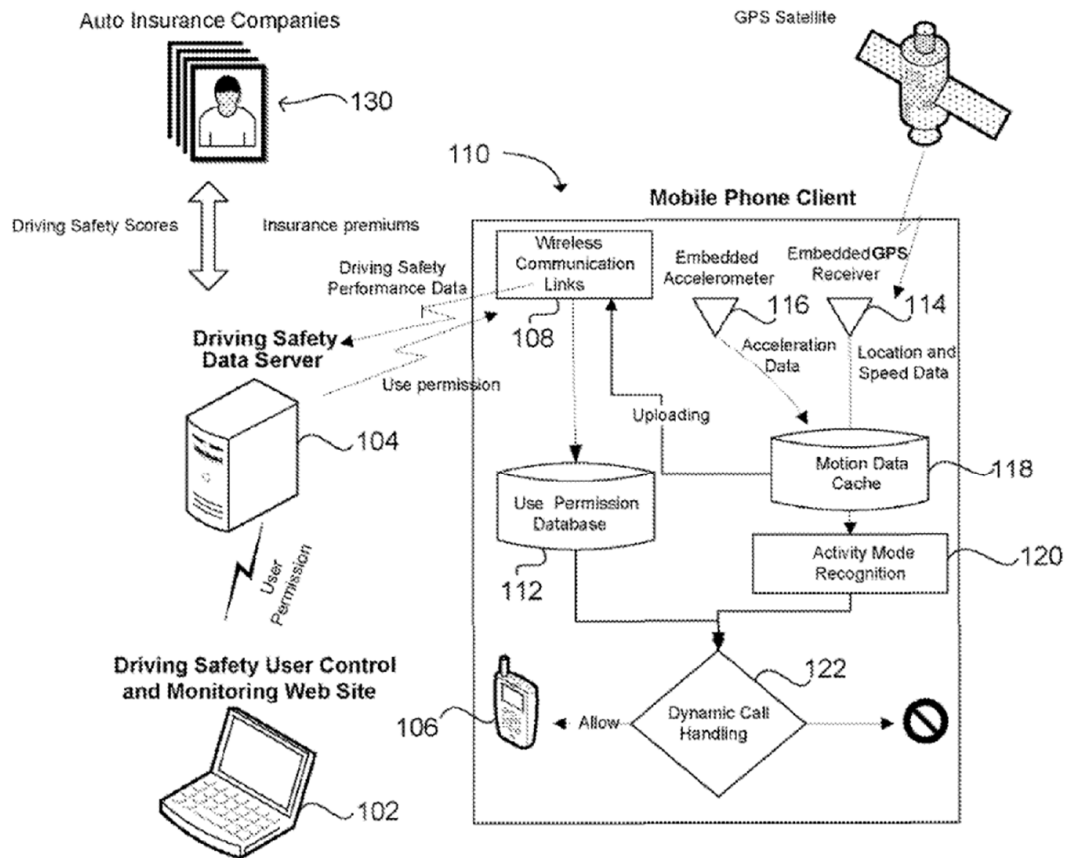


FIG. 1

USAA-1006, Fig. 1

Raw data and resolved driving behavior information are stored in the phone (e.g., “motion data cache 118,” “local 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.” USAA-1006, Abstract, 3:2-4:6, 13:3-14:26, 17:1-18:3, Figs. 1, 3, 6. USAA-1003, ¶83.

c) Thompson

Thompson2010 offers techniques focused on smartphone-based accident detection applications. It describes how smartphones “can capture the streams of data provided by their accelerometers, compasses, and GPS sensors to provide a portable ‘black box’ that detects traffic accidents and records data related to accident events, such as the g-forces (accelerations experienced by the driver).” USAA-1007, 30; USAA-1003, ¶84. Figure 2 shows a smartphone-based accident detection system.

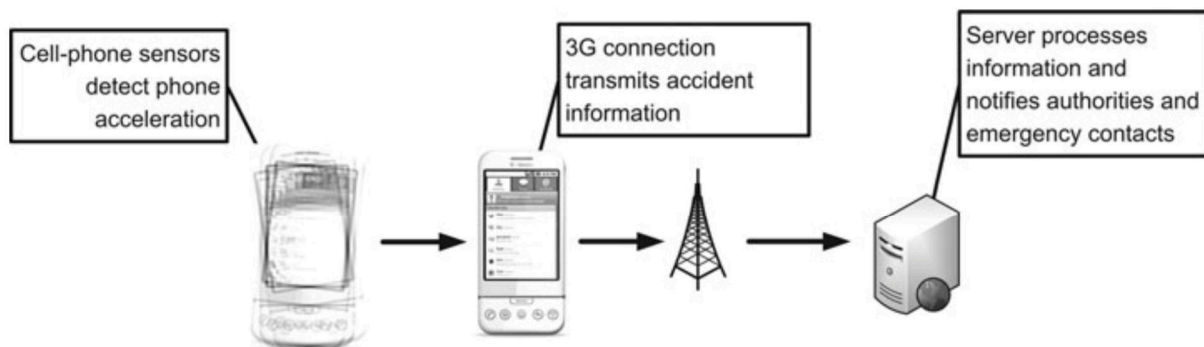


Fig. 2. Smartphone-Based Accident Detection System

USAA-1007, Fig. 2

Thompson’s system employs a client-server architecture in which “sensors

built into a smartphone detect a major acceleration event indicative of an accident and utilize the built-in 3G data connection to transmit that information to a central server.” USAA-1007, 30. The server “then processes the information and notifies the authorities as well as any emergency contacts.” *Id.* This client-server architecture (“WreckWatch”) is a “mobile client/server application [] developed to automatically detect car accidents.” USAA-1007, 30; USAA-1003, ¶85.

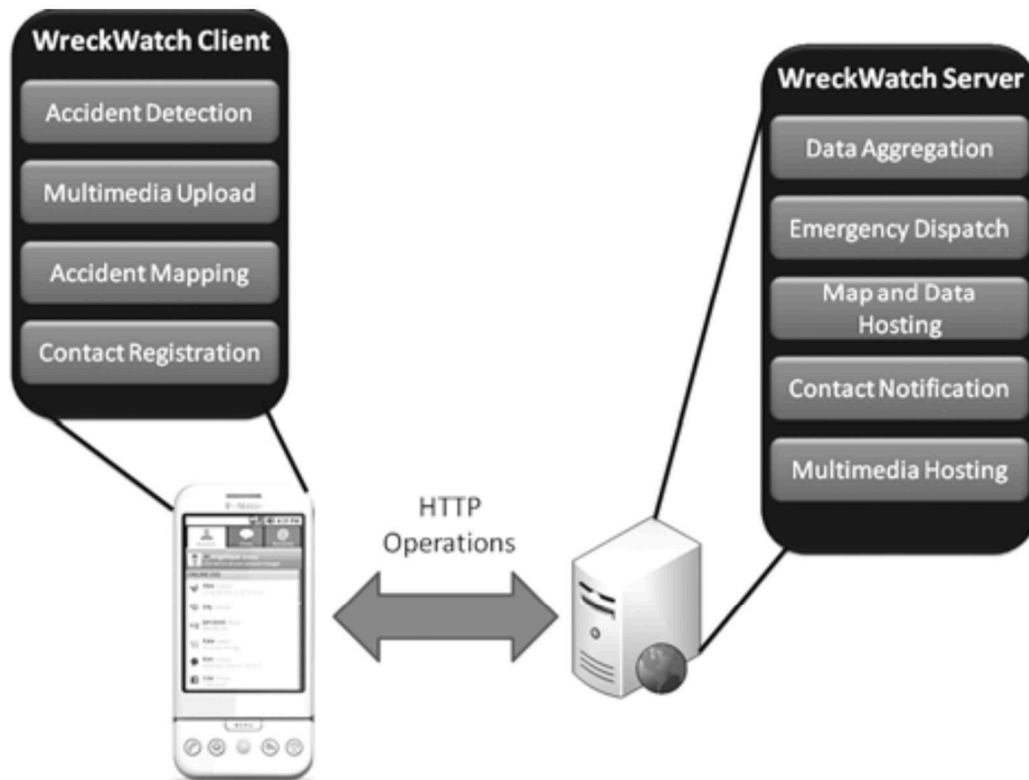


Fig. 3. WreckWatch Architecture Diagram

USAA-1007, Fig. 3

d) Callopy-Curry

As discussed (§III.A.1.a), Callopy describes a system for dynamic insurance

adjustment based on real-time data gathered using a mobile device in a vehicle.

USAA-1005, Abstract, [0017]-[0018], [0165], [0321]-[0323], FIGS. 40-42. To determine “an appropriate insurance rate[,]” a mobile device 4005 (with GPS and accelerometer) is used to capture, process, and communicate driving-related data to insurance provider system 4035. USAA-1005, [0306]-[0357], FIGS. 40-42. While Callopy broadly describes its system as using “various analytical methods” to “facilitate determination of an appropriate insurance rate,” it otherwise does not provide specific implementation detail on how the rate is calculated. *Id.*, [0307]; *id.*, [0004]. Without such detail, a POSITA seeking to implement Callopy’s teachings would have been motivated to seek well-known insurance rate calculation techniques for further guidance. USAA-1003, ¶100.

As noted in §III.A.1.b, Curry describes well-known insurance rate calculation techniques through use of scoring to reflect risk factor assessment of driving-related information captured by mobile device sensors. USAA-1006, 10:2-12, 11:15-25, 13:27-14:4. Curry explains that a “cost of the insurance premium for the user can be reduced or increased based on the safety score of the user,” which can further be used to “encourag[e] the vehicle operator to operate the vehicle within acceptable parameters.” *Id.*, 10:2-12. A POSITA would have been motivated to incorporate these features into the Callopy system to predictably enhance Callopy’s insurance rate calculation techniques. USAA-1003, ¶101.

Given the overlap in functionality between Callopy and Curry, a POSITA would have found the incorporation of Curry's teachings into the Callopy system obvious. *Id.*

To combine the teachings of Callopy and Curry, a POSITA would have incorporated functionality associated with client 110 running on Curry's mobile phone 106 (e.g., monitoring involving the calculation and use of driver safety statistics, activity mode recognition and monitoring) into the pre-existing mobile device 4005 within the Callopy system. USAA-1003, ¶102. As noted in §III.A.1.b, client 110 provides functionality relating to modules (e.g., activity mode recognition module, driving safety evaluation module) that evaluate recorded sensor data in calculating values for safety scores (e.g., driver safety statistic). USAA-1006, 3:24-4:6, 9:31-33, 11:3-14, 12:3-18, Figs. 1, 3. Callopy similarly teaches sensor data evaluation capabilities within its mobile phone 4005 in assessing "driving skills, habits, etc." USAA-1005, [0307]. A POSITA would have therefore perceived the incorporation of Curry's client 110 and its associated module functionality into Callopy's mobile device 4005 a natural modification that is consistent with the disclosures of each reference. USAA-1005, [0307]; USAA-1003, ¶102. The Callopy-Curry phone thereby provides the combined functionality of Callopy's local application 4180 and Curry's client 110. *Id.*

Implementation of the Callopy-Curry phone aligns with standard insurance

evaluation methods and encourages the adoption of Curry's scoring method within Callopy's system. Use of the Callopy-Curry phone also enhances the sensor-based driving evaluation described in Callopy by leveraging the capabilities of Curry's mobile device 106, which is capable of log data and processing safety statistics in determining a driver risk profile for insurance purposes. USAA-1006, 3:24-4:6, 9:31-33, 11:3-14, 12:3-18, Figs. 1, 3. Curry further supports the combination through a broader motivation towards "programs and initiatives to reduce traffic-related fatalities and injuries." USAA-1006, 2:9-21; USAA-1003, ¶103.

The modification discussed above would have also been obvious for several reasons. First, a POSITA would have recognized that Callopy's system (which collects and transmits driving data for risk assessment) and Curry's system (which processes sensor data to compute a driving score for insurance purposes) can be predictably combined to evaluate and log driver risk. USAA-1005, [0307]; USAA-1006, 7:5-22. Callopy already describes storing historical driving data and analyzing risk factors, and Curry states that a driving score is calculated from acceleration and speed data to determine risk. *Id.* Both references focus on insurance-based driver evaluation, their combination would involve nothing more than applying known techniques for their intended purpose. USAA-1003, ¶104.

Additionally, Curry's scoring technique reflects a predictable solution to Callopy's desire to assess driver risk for insurance purposes. *Id.*, ¶105. A

POSITA would have recognized that incorporation of Curry's safety score calculation into Callopy's system provides an enhanced and quantifiable risk assessment that follows a finite number of identified, predictable solutions to improve driver risk profiling. *Id.*, ¶106. The predictability is further supported by each reference expressly teaching a mobile device capable of collecting acceleration and speed data. USAA-1005, [0308]; USAA-1006, 3:24-4:6.

Further, configuring Callopy's systems to leverage Curry's teachings would have required only routine programming knowledge well within the skill of a POSITA prior to the earliest effective filing date. *Id.*, ¶106. 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 sensors and monitoring software and third party insurance providers determining appropriate insurance premiums – in a similar way, and combining prior art elements according to known methods to yield the predictable results described above. *KSR*, 550 U.S. at 417.

The elements of the combination would also each perform functions they had been known to perform prior to the combination—mobile device 4005 (modified to incorporate functionality of Curry's client 110 and associated modules) would perform the same functions as taught in Callopy in capturing driving-related data for determining insurance premiums. USAA-1003, ¶107. A

POSITA would have therefore had more than a reasonable expectation of success when incorporating Curry's teachings into Callopy. *Id.*, ¶¶108-10.

e) Callopy-Curry-Thompson

As discussed in §III.A.1.d, while Callopy and Curry generally contemplate driving-related risk assessment, they do not specifically focus on detecting an emergency or actions performed in response to a detected emergency. USAA-1005, [0307]-[0310], [0314]-[0324]; USAA-1006, 4:16-28, 10:16-26, cl. 9. And yet, Curry provides a broader motivation towards "programs and initiatives to reduce traffic-related fatalities and injuries." USAA-1006, 2:9-21. And, due to concerns for motorized vehicle accidents and deaths, a POSITA would have understood that accident detection techniques advance Curry's overall motivation to reduce vehicular casualties. USAA-1003, ¶¶111-13. This would have motivated a POSITA to seek well-known accident detection techniques to supplement the risk assessment capabilities of Callopy-Curry. *Id.*

As discussed in §III.A.1.c, Thompson describes techniques for evaluating sensor data collected by a smartphone (e.g., acceleration data) to detect a vehicle accident. USAA-1007, 30, Fig. 2. Like Curry and Callopy, Thompson's smartphone similarly has the same sets of sensors (e.g., accelerometer, GPS sensor), making the accident detection capabilities based on sensor data of a smartphone pertinent to Callopy-Curry. USAA-1007, 2, 8-10. Because the

sensors used for accident detection within Thompson are already available in the mobile devices described in Callopy and Curry, a POSITA would have been motivated to incorporate Thompson's accident detection capabilities into the Callopy-Curry phone discussed above in §III.A.1.d with minimal or no changes to its hardware. USAA-1003, ¶114.

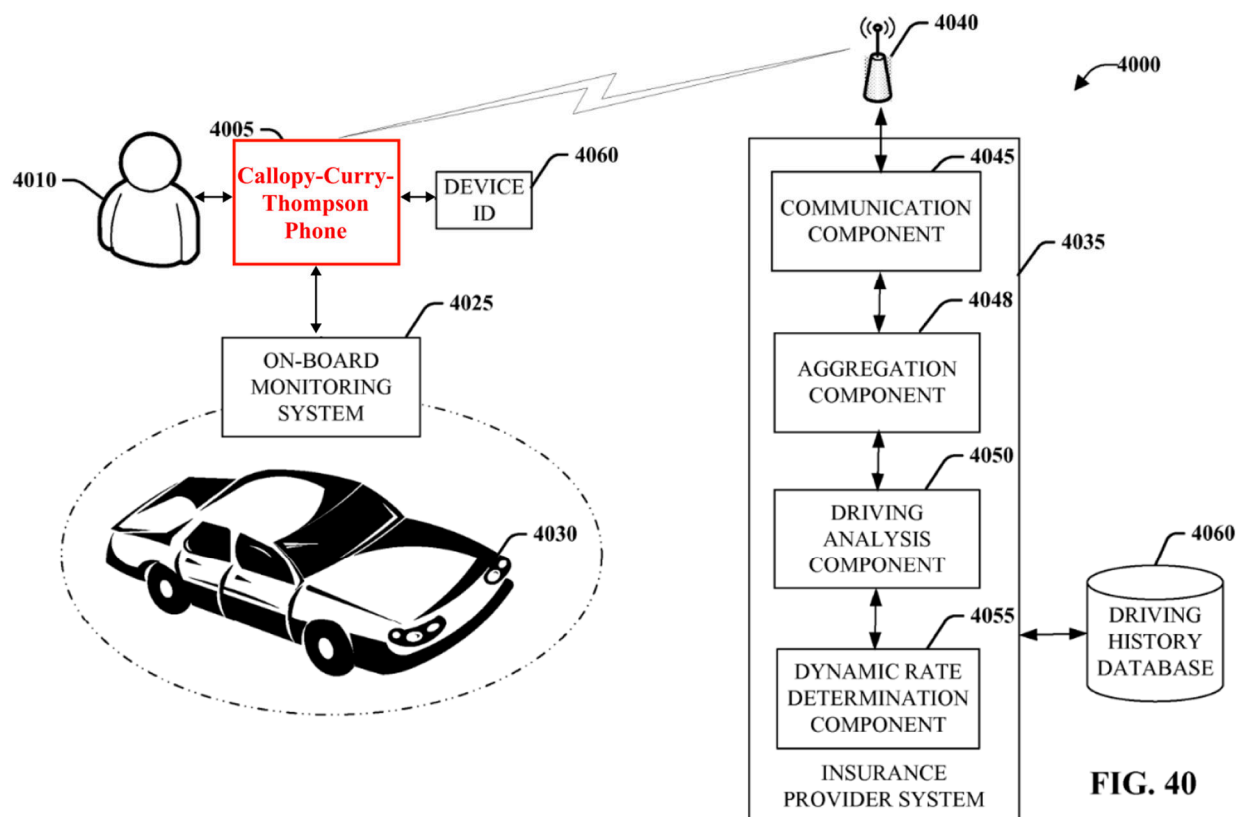
To incorporate Thompson's teachings into the Callopy-Curry system, a POSITA would have further modified the Callopy-Curry phone to include accident detection functionality provided by Thompson's WreckWatch application. The Callopy-Curry-Thompson phone ("CCT phone") thereby includes an application with the combined functionality of Callopy's local application 4180, Curry's client 110, and Thompson's WreckWatch application. The combined functionality provided by the CCT phone advances Callopy and Curry's overall motivations to reduce casualties resulting from vehicular accidents. USAA-1003, ¶115. The functionality also allows Curry's motion recording technique to achieve advantages that Thompson describes for smartphone-based accident detection, including "reduc[ing] overall traffic congestion and increas[ing] the preparedness of emergency responders." USAA-1007, Abstract.

As combined, the CCT phone provides each of the monitoring functionality described in Callopy, Curry, and Thompson, including recording sensor data relating to driving, calculating driving safety statistics, and detecting driving-

related incidents (e.g., accident events, abnormal acceleration, abnormal braking).

See USAA-1005, [0307]-[0310], [0314]-[0324]; USAA-1006, Abstract, 2:1-27, 3:1-4:28, 7:5-29, 8:21-27, 10:15-12:18, Figs. 1, 3; USAA-1003, ¶116.

Further, to support Thompson's accident detection capabilities, insurance provider system 4035 incorporates functionality associated with Thompson's WreckWatch server (e.g., data aggregation, communication conduit to emergency responders). USAA-1003, ¶117; USAA-1007, 6-7. An example of the Callopy-Curry-Thompson system incorporating the CCT phone is shown in the annotated version of Callopy's Figure 40 below:



Callopy-Curry-Thompson

Finally, a POSITA would have perceived configuring the Callopy-Curry phone to incorporate Thompson's accident detection capabilities as an implementation detail. USAA-1006, 9:23-10:12; USAA-1007, 30, 33-34. The modifications to Callopy-Curry based on Thompson's teachings would have involved use of a known technique (Thompson's accident detection techniques) to improve similar types of mobile devices (mobile devices with accelerometers and GPS sensors, as described in Callopy and Curry). USAA-1003, ¶118.

Further, Thompson's accident detection techniques involve use of sensors already present in Callopy's mobile device 4005 and Curry's mobile phone 106 such that implementation of the CCT phone may be achieved without any changes to its underlying hardware. USAA-1003, ¶119. Implementation of Callopy-Curry-Thompson thereby involves combining prior art elements according to known methods to yield the predictable results described above. *KSR*, 550 U.S. at 417. A POSITA would have therefore had more than a reasonable expectation of success when incorporating Thompson's teachings into Callopy-Curry. USAA-1003, ¶¶120-23.

2. Claims 1-4

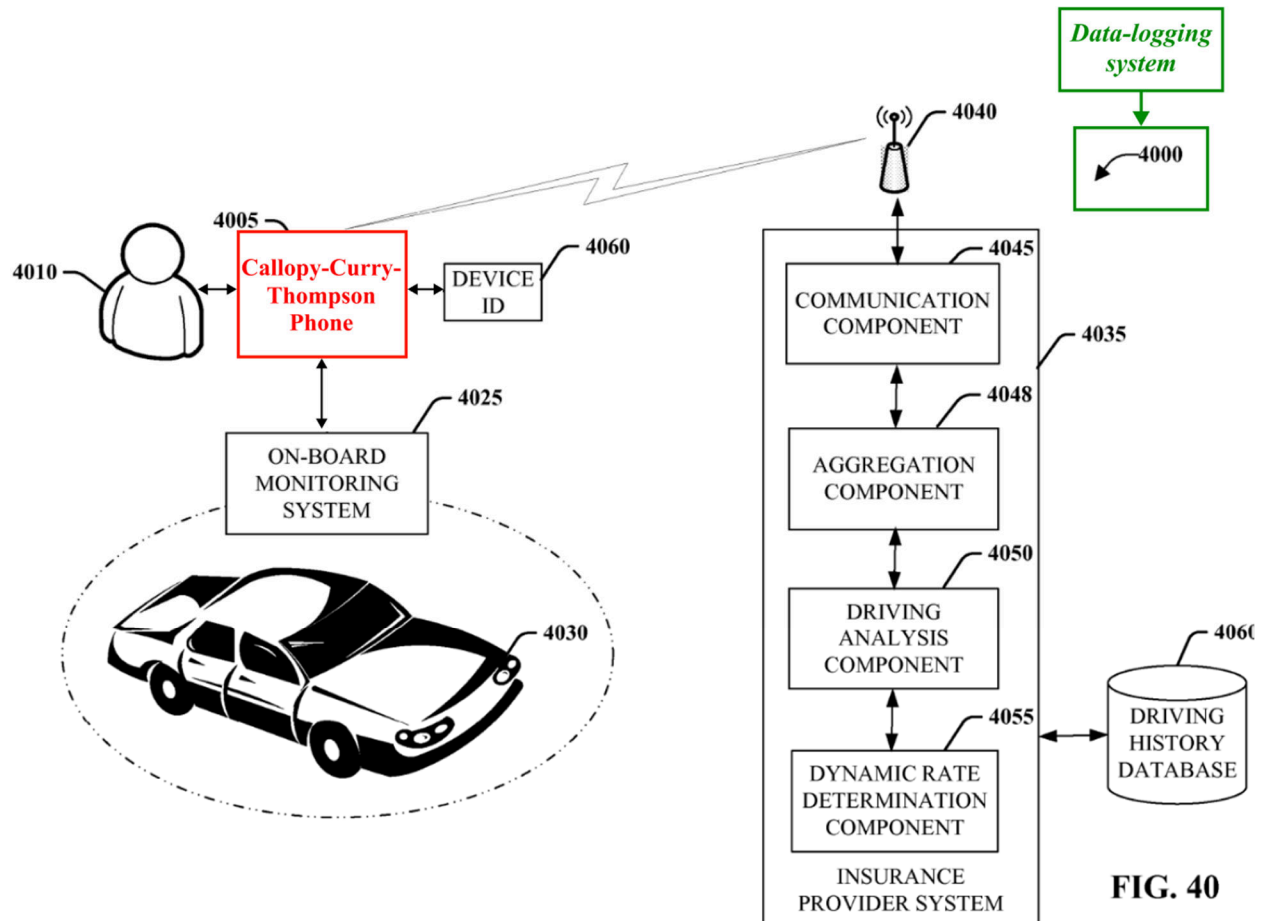
a) Claim 1

[1.1]

To the extent that the preamble is limiting, Callopy-Curry-Thompson renders it obvious. The combination includes functionality of Callopy's "system

4000” (*data-logging system*), such as real-time monitoring of driving activity data associated with the CCT phone and an insurance provider system 4035. USAA-1005, [0307]. The insurance provider system 4035 communicates with the CCT phone using wireless communications (as taught in Callopy). *Id.*; USAA-1003, ¶124.

Callopy teaches examples of various analytical methods to facilitate determining a driver’s safety profile, which involves monitoring how safely the vehicle is being driven. *See, e.g.*, USAA-1005, [0004], [0307], [0308]. The collected driving information includes real-time data that is continuously transmitted and logged during the driving period. *Id.* Curry further reinforces the concept of monitoring vehicle movement by teaching a system that records acceleration, deceleration, and location information to assess driving safety. USAA-1006, 3:24-4:6; USAA-1003, ¶125.



USAA-1005, FIG. 40 (annotated)

As discussed for [1.5], *infra*, Callopy-Curry-Thompson provides a phone capable of deriving various types of **driving information**. For instance, Callopy describes “monitor[ing] and gather[ing] information regarding driver 4010’s driving skills, habits, etc.” USAA-1005, [0307]; *id.*, [0320]. Curry similarly describes “driving behavior” information, such as “talking...or texting...while driving” (USAA-1006, 7:5-29) and “speeding, abnormal acceleration, abnormal deceleration, and taking sharp turns” (*id.*, 3:24-4:6). Finally, Thompson describes “detect[ing] accidents by polling smartphone system sensors, such as the GPS

receiver and accelerometers” using a smartphone software client. USAA-1007, 5.

This functionality is provided during a time period when a vehicle is being driven (*driving period*). *Id.*; USAA-1003, ¶¶126-28.

Finally, the claim language is without any requirement for the *driving period* to be defined by an entire time period of driving. *See* USAA-1003, ¶70 (citing USAA-1048, 6). Rather, to the extent the claims identify any defining attribute for the *driving period*, it is with respect to a *duration of a vehicle journey*. *See* [1.6], *infra*. Claim 1 also lacks language regarding the start or end of the *driving period* or a specific type of duration. As such, under plain meaning, the *driving period* of claim 1 encompasses a time period representing a *vehicle journey* whether the start of the *driving period* is at the start of driving or at some later time point during driving. USAA-1003, ¶129.

Indeed, AT advanced a similar interpretation in related proceedings with respect to claim language reciting a “start of a driving period.” *See, e.g.*, IPR2023-00518, Pap. 18, 7-18. In its Final Decision, the Panel found that a related patent with the same specification as the ’728 patent “teaches there are **several ways** to register the start of a driving period,” including “an example of the start of a driving period that initiates ‘once a velocity greater than 20 kilometers per hour is detected.’” Pap., 30, 11-12 (citing specification at 19:4-6).

Here, claim 1 does not recite a determination relating to a “start” of a driving

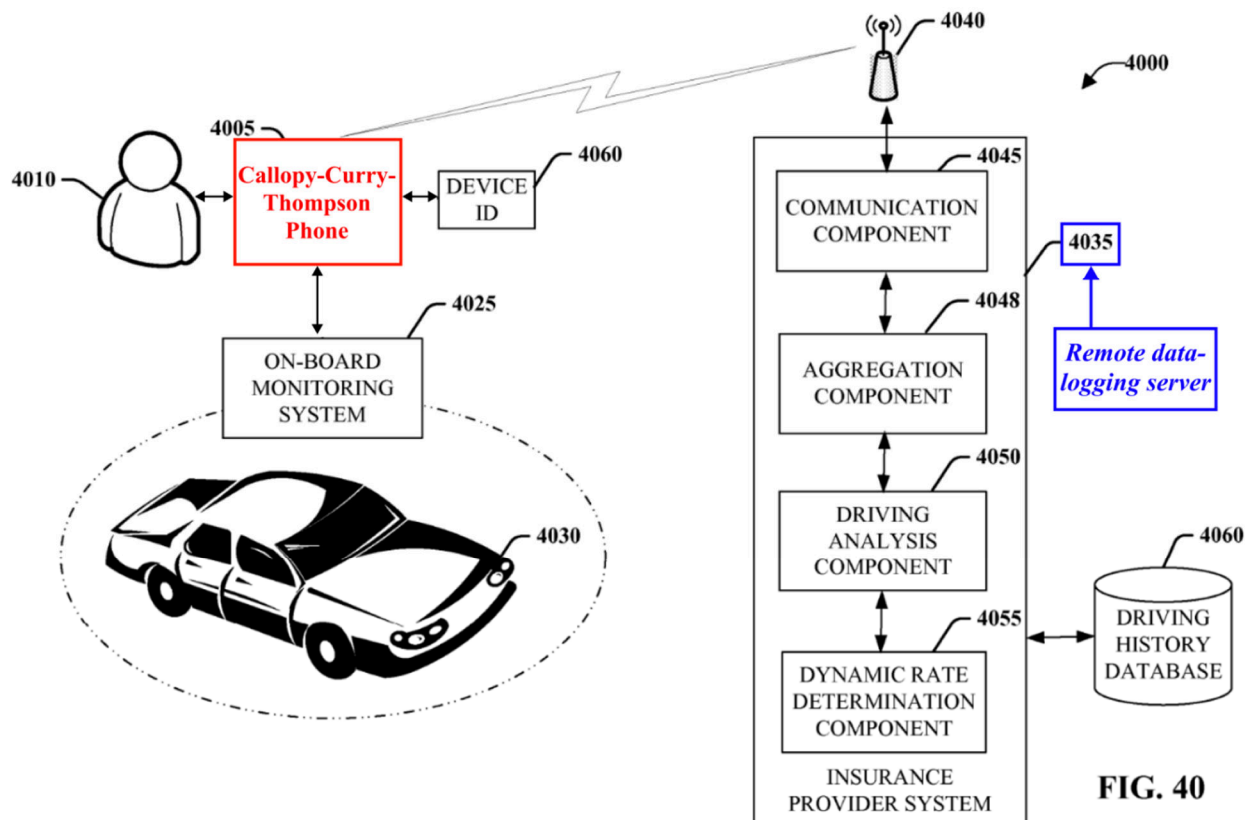
period. Unlike the claim language at-issue in IPR2023-00518, claim 1 (and claims 13 and 24) merely limit the *driving period* to be *a duration of a vehicle journey* without any language reflecting the timing restrictions associated with either the “duration” or the “vehicle journey.” Thus, as the Board found in IPR2023-00518, “a POSITA would understand the recited ‘driving period’ may start after the vehicle is in operation, rather than the entire driving time.” *Id.*, 13. The Board also declined to adopt AT’s assertion that “the Specification discloses processing for the *entire* time period.” *Id.* Instead, the Board established that the intrinsic record demonstrated that “the start of a driving period for mobile telecommunications device 17 may occur after the vehicle is already in use or operation.” *Id.* (citing Specification, 18:40-19:43, 16:48-18:32, 20:23-51).

Regardless, even if the *driving period* were interpreted to require an entire time period of driving, such a configuration is obvious over Callopy-Curry-Thompson. USAA-1003, ¶¶130-131. Given Callopy’s suggestion that its mobile device 4005 monitors a variety of driver information, a POSITA would have found it advantageous to configure the CCT phone to initiate a recording period (*driving period*) at the start of driving to, for instance, collect additional information about “driving skills, habits, etc.,” each of which is pertinent to insurance calculations. USAA-1005, [0307]. Callopy, Curry, and Thompson each teach mobile devices with accelerometers and GPS sensors, and given the availability of motion

detection capabilities within the CCT phone, a POSITA would have found it obvious to leverage such capabilities to detect, for instance, motion associated with a vehicle being driven. *See, e.g.*, USAA-1005, [0323]; USAA-1003, ¶132.

[1.2]

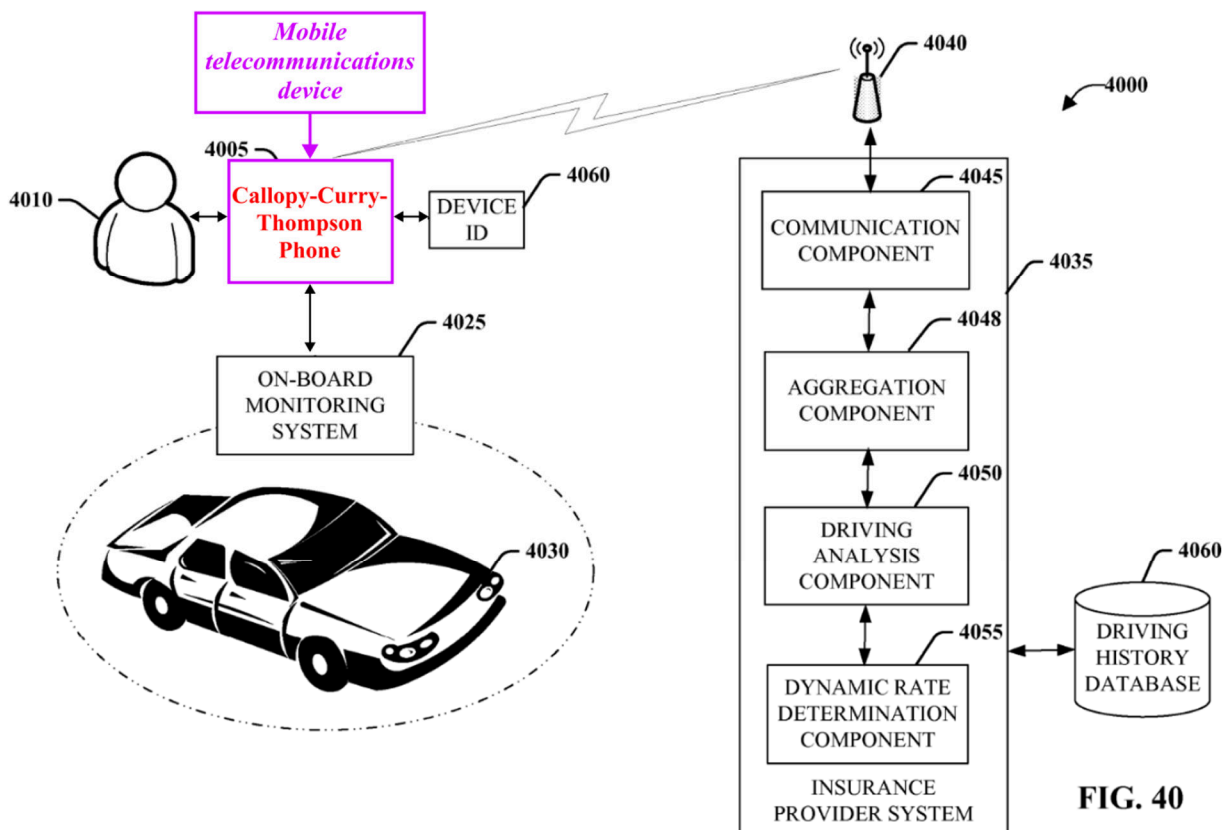
Insurance provider system 4035 (*remote data-logging server*) is configured to communicate with the CCT phone by “employing wireless communications” “via a transceiver 4040 and a communication component 4045.” USAA-1005, [0307]. As discussed for [1.10]-[1.14], *infra*, insurance provider system 4035 includes functionality for the additional limitations recited in claim 1 for the *remote data-logging server*. USAA-1003, ¶133.



USAA-1005, FIG. 40 (annotated)

[1.3]

The CCT phone (*mobile telecommunications device*) includes an application with the combined functionality of Callopy's local application 4180, Curry's client 110, and Thompson's WreckWatch application. *See* §III.A.1.e; USAA-1005, [0307]-[0310], [0314]-[0324]; USAA-1006, Abstract, 2:1-27, 3:1-4:28, 7:5-29, 8:21-27, 10:15-12:18, Figs. 1, 3; USAA-1003, ¶134.



USAA-1005, FIG. 40 (annotated)

This configuration enables determination of whether an associated vehicle is being driven. USAA-1006, 8:20-9:33. The application additionally enables the CCT phone to process “raw data” collected during a driving period to log driving

activity and derive information associated with a user's driving behavior. *Id.*, 8:30-9:3; *see also id.*, Abstract, 3:24-4:6, 11:3-14, Figs. 1, 3, 5; USAA-1003, ¶135.

The CCT phone features a “graphical ***user interface***” (USAA-1006, 8:5-27) configured to display data (*id.*, 21:23-25) and to enable user interactions. Curry also describes various examples of UI-enabled user interactions including receiving a phone call while driving, and manually switching activity modes. *Id.*, 7:5-27, 8:5-27, 9:5-28, 10:15-25, 13:20-26, 16:7-22, 21:23-25. Callopy and Thompson similarly describe mobile devices with user interfaces. *See, e.g.*, USAA-1005, [0346]; USAA-1007, 32-33, Fig. 3. USAA-1003, ¶136.

The CCT phone also includes a ***processor*** because, as described in Callopy, a mobile phone includes any combination of components that allow gathering, processing, transmission, presentation, evaluation determination of insurance rates and any pertinent information...” USAA-1005, [0321]. Curry similarly teaches processes may be “implemented in software for execution by various types of processors.” USAA-1006, 6:3-10; *see id.*, 3:24-26, 8:20-27. Based on Curry's suggestion that 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 CCT phone to have been implicitly disclosed, and if not, obvious. *Id.*, 8:20-27, Fig. 1; USAA-1021, 237-250; USAA-1003, ¶137; *see also* USAA-1006, 2:22-27, 6:3-10; USAA-1007, 29;

USAA-1021, 4; USAA-1024, 2-8; USAA-1022, ¶¶[0046]-[0063], FIG. 3.

Similarly, the CCT phone also includes *memory* because, as described in Callopy, a mobile phone includes “memory buffer 4170” that “allows data to be gathered and stored” in relation to local applications 4180 running on the mobile phone. USAA-1005, [0329]. Curry similarly describes “memory devices” that store sensor data, derived information, and “executable code.” USAA-1006, 6:11-20. A POSITA would therefore have understood and found obvious that the CCT phone includes memory devices for storing data, e.g., raw sensor data and information derived from the raw sensor data. *Id.*, 7:5-22, 8:29-9:28, 13:20-15:6, Fig. 3. *See* USAA-1007, 32-33; USAA-1003, ¶138.

The CCT phone also includes a *sensor set* because, as suggested in Callopy, a mobile phone includes an “accelerometer” (*accelerometer*) and “GPS” (*positioning module*). USAA-1005, [0032]; *see id.*, [0038], [0323]. Curry similarly describes a mobile phone 106 with embedded sensors, including accelerometer 116 and GPS receiver 114. USAA-1006, 2:23-27, 3:2-15, 7:23-8:2, 8:30-9:3, 10:16-26, 11:15-25, Fig. 1; USAA-1024, 2-3; USAA-1025, 87, 88, 108. Thompson similarly describes mobile devices with sensor sets, including an accelerometer and positioning sensors. *See* USAA-1007, Abstract; USAA-1003, ¶139.

[1.4]

The CCT phone includes an application (*application*) with the combined functionality of Callopy's local application 4180, Curry's client 110, and Thompson's WreckWatch application. Consistent with Curry, the application may be downloaded from a server (e.g., Curry's server 104) onto the CCT phone (*downloaded onto the memory*). USAA-1006, 7:5-29, 8:21-9:33, 9:5-11. The application enables the CCT phone to perform various actions, including processing sensor data from a driving period to derive information associated with a user's driving behavior, and processing the stored information to determine a mode within which the phone should operate. The application includes software logic (*computer-executable instructions*) executed by a phone processor (*processor*) to cause the CCT phone to provide such functionality. *Id.*; USAA-1003, ¶140.

[1.5]

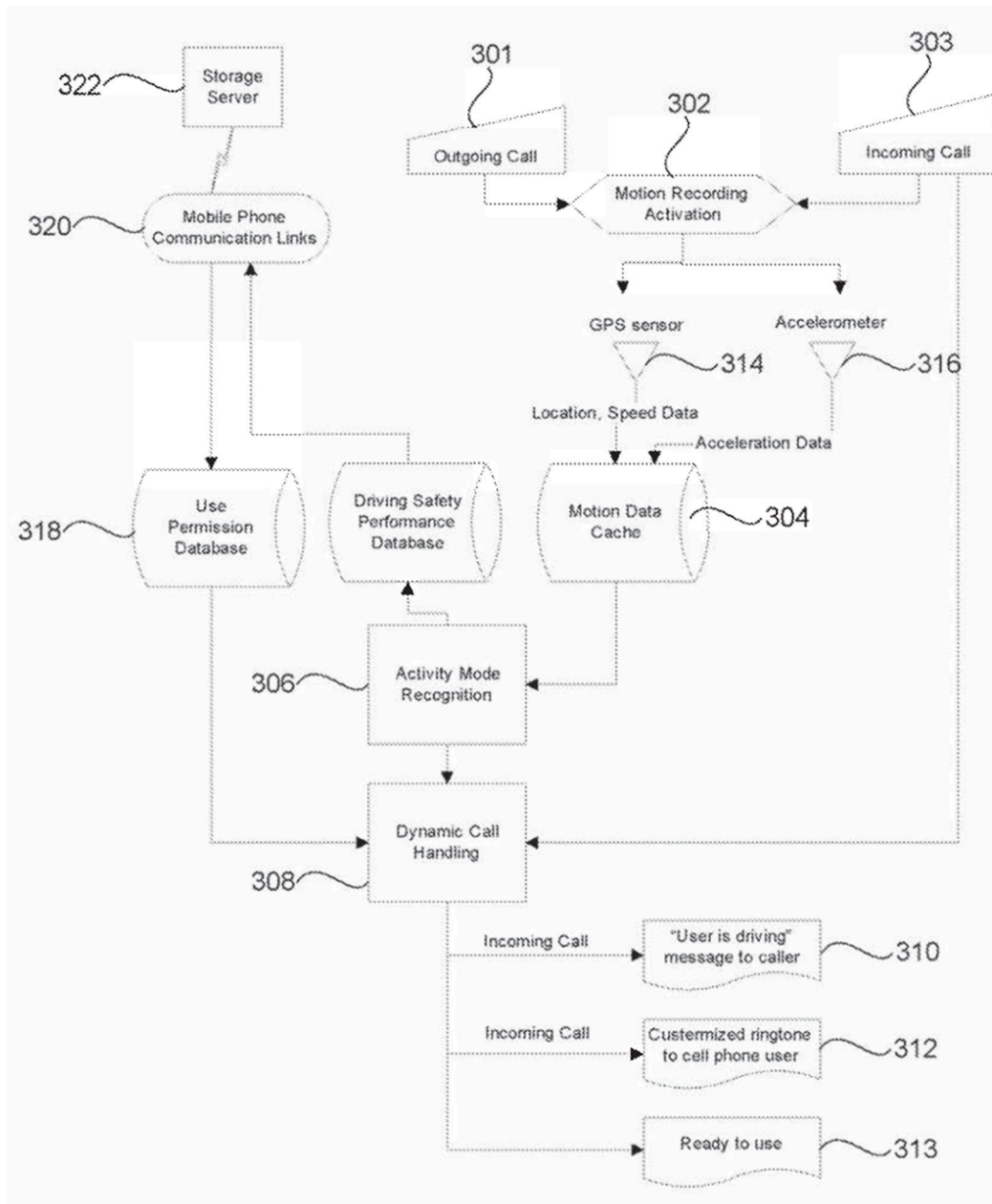
As explained for [1.1], the claim language is without any requirement for the *driving period* to be defined by an entire time period of driving. Rather, to the extent the claims identify any defining attribute for the *driving period*, it is with respect to a *duration of a vehicle journey*. See [1.6], *infra*. Notably, however, claim 1 lacks any such attributes with respect to the start or end of the *driving period*, or a specific type of duration (i.e., a duration representing by the vehicle being in motion). See IPR2023-00518, Pap. 30, 11-12. As such, under its plain

meaning, the *driving period* encompasses a time period representing a *vehicle journey* whether its start is at the start of driving or at some later time point during driving. USAA-1003, ¶141. Regardless, as discussed for [1.1], even if the *driving period* were interpreted to require an entire time period of driving, such a configuration is obvious over Callopy-Curry-Thompson. USAA-1003, ¶¶142-44; USAA-1005, [0307]; USAA-1006, 13:20-14:4.

Further, the CCT phone is configured to process sensor acceleration data (*acceleration of the vehicle*) and movement data (*position of the vehicle*) recorded from its embedded sensors (e.g., accelerometer, GPS sensor) during the driving period to generate various types of derived information relating to driving (*driving information*). For example, in Curry, a mobile phone processes sensor data to derive “driving behavior” information, e.g., “talking...or texting...while driving” and “speeding, abnormal acceleration, abnormal deceleration, and taking sharp turns.” USAA-1006, 7:5-29, 8:21-27, 8:30-9:33, 10:15-26, 11:3-14. Callopy similarly describes that its mobile device derives, from acceleration and position data, “information regarding driver 4010’s driving skills, habits, etc.” USAA-1005, [0307]. Thompson likewise processes accelerometer data to determine accidents. USAA-1007, 8; USAA-1003, ¶145.

For example, in Curry’s Figure 3 (below), “[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-1006, 13:27-31. 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-1006, 13:20-13:26, Fig. 3; USAA-1003, ¶146.



USAA-1005, FIG. 3

From this and related descriptions, a POSITA would have understood and/or found obvious processing sensor data during the driving period to generate *derived driving information*, e.g., “talking...or texting...while driving” and “speeding, abnormal acceleration, abnormal deceleration, and taking sharp turns.” USAA-

1006, 7:5-29; *see id.*, 7:5-29, 8:21-27, 8:30-9:33, 10:15-26, 11:3-14 Figs. 1, 3;

USAA-1021, 233-250; USAA-1003, ¶¶147-51.

[1.6]

Callopy-Curry-Thompson renders [1.6] obvious. As discussed for [1.3], the CCT phone includes an application with the combined functionality of Callopy's local application 4180, Curry's client 110, and Thompson's WreckWatch application. Based on this configuration, it would have been obvious that a recording period associated with vehicle monitoring by the CCT phone (*driving period*) is defined by a time duration associated with vehicle travel (*duration of a vehicle journey*). USAA-1003, ¶152. The CCT phone is configured to start the recording period based on sensor data (e.g., a measured speed satisfying a threshold, a detected change in activity mode to driving). *See* USAA-1005, [0307]; USAA-1006, 13:20-26; USAA-1007, 8. Further, smartphone configurations for using sensor data in relation to starting and terminating driving-related monitoring periods were well-known by the Critical Date. *See* USAA-1003, ¶¶272-74 (citing USAA-1010, 11:21-40, USAA-1049, 198-99).

Specifically, as explained for [1.1] and [1.5], the claim language is without any requirement for the *driving period* to be defined by an entire time period of driving. Rather, to the extent the claims identify any defining attribute for the *driving period*, it is with respect to a *duration of a vehicle journey*. Again, claim

1 lacks any such attributes with respect to the start or end of the *driving period*, or a specific type of duration (i.e., a duration representing by the vehicle being in motion). See IPR2023-00518, Pap. 30, 11-12. As such, under its plain meaning, the *driving period* encompasses a time period representing a *vehicle journey* whether its start is at the start of driving or at some later time point during driving. USAA-1003, ¶143. Regardless, even if the *driving period* were narrowly interpreted to require an entire time period of driving, such a configuration is obvious over Callopy-Curry-Thompson. *Id.*, ¶¶153-55 (citing USAA-1005, [0307], USAA-1006, 13:20-26).

Thompson also teaches the capability to determine each of the start and the end of monitoring, thereby rendering obvious the capability to determine the *duration of a vehicle journey*. For example, a “[s]peed filter” is used to “determine[] whether users are in vehicles” and, in some embodiments, the phone “begins recording accelerometer information and looking for potential accidents above 15mph.” USAA-1007, 8. Further, the phone maintains this monitoring context “until the device is unplugged...” *Id.* From these disclosures, a POSITA would have understood that the CCT phone may similarly be configured, for example, to use a speed filter to initiate the monitoring of sensor data in relation to the *driving period* such that the monitoring period is *defined* by a vehicle’s travel when speed is above 15mph and until the CCT phone is unplugged (*duration of a*

vehicle journey). USAA-1003, ¶156.

Further, because “[t]his speed threshold may be adjusted at compile time,” a POSITA would have understood and found obvious that, in some implementations, the CCT phone may be configured to use a lower speed threshold (e.g., 1mph) to, for instance, capture a greater portion of the time a vehicle is being driven. USAA-1008, 8. Use of lower speed threshold values is also consistent with Thompson’s suggestion that its application is configured to maintains recording “until the device is unplugged, which prevents Wreck-Watch system from shutting off at stop lights.” USAA-1008, 8; USAA-1003, ¶157.

Consistent with the teachings of Callopy and Curry, the CCT phone is also configured to calculate scores associated with monitored sensor information, rendering the *driving score* obvious. Curry describes calculating driving safety scores based on driving behavior information derived from sensor data, “talking...or texting...while driving” (USAA-1006, 7:5-29) and “speeding, abnormal acceleration, abnormal deceleration, and taking sharp turns” (*id.*, 3:24-4:6). USAA-1003, ¶158. Further, because Curry’s mobile phone 106 adjusts a driver safety statistic based on previously-collected motion data, the CCT phone may be similarly configured to locally calculate a driving score. *See* USAA-1006, 11:3-10, 12:6-18; USAA-1003, ¶159.

[1.7]

As discussed for [1.3], the CCT phone includes application with the combined functionality of Callopy's local application 4180, Curry's client 110, and Thompson's WreckWatch application. In Thompson, a smartphone is configured to process accelerometer data (*raw sensor data*) in detecting an accident occurring within a monitoring period (*driving incident occurring within the driving period*). USAA-1007, 8-10. For example, the smartphone "detects traffic accidents and records data related to accident events, such as the G-forces (accelerations) experienced by the driver." *Id.*, 2. Thus, the CCT phone is similarly configured to detect an accident event (*vehicle accident*). USAA-1003, ¶¶160-61.

To detect accident events, the CCT phone compares values specified in accelerometer data (*comparing*) with a threshold (e.g., 4g measured acceleration) (*at least one predetermined threshold value*) to differentiate between normal movement and a car accident. USAA-1007, 8 ("This value is designed to detect even minor accidents but filter out a drop or sudden stop."). This differentiation allows the detection of accidents based on values exceeding 4g's (*detecting the driving incident when the raw sensor data exceeds the at least one predetermined threshold*). *Id.*, ¶162.

Beyond accident detection, the CCT phone is also configured to determine other types of driving incidents recited in [1.7]. As discussed above, consistent with Curry's teachings, the CCT phone detects "abnormal acceleration" (*harsh*

acceleration), “abnormal deceleration” (*harsh braking*), and “taking sharp turns” (*harsh swerving*). USAA-1006, 3:24-4:6. A POSITA would have understood and found obvious that these parameters may be determined through use of an appropriate threshold value. USAA-1003, ¶¶163-67.

[1.8]

Callopy-Curry-Thomson renders [1.8] obvious. As discussed for [1.5], the CCT phone generates *derived driving information* based on sensor data collected by mobile device sensors (GPS sensor, accelerometer). USAA-1005, [0308], [0323]-[0324], [0330], [0333]-[0334], [0342], [0346], [0388]. This information may include “information regarding driver 4010’s driving skills, habits, etc.” (USAA-1005, [0307]) and “driving behavior” information, such as “talking...or texting...while driving” (USAA-1006, 7:5-29) and “speeding, abnormal acceleration, abnormal deceleration, and taking sharp turns” (*id.*, 3:24-4:6). USAA-1003, ¶168.

Given that the CCT phone includes requisite sensing and processing capabilities to generate the *derived driving information*, a POSITA would have understood and found obvious that the information may be generated without reliance on *vehicle sensors*. USAA-1003, ¶169. Callopy explains that the “GPS 4110 and the accelerometer 4120 can be located in the mobile device.” USAA-1005, [0323]. Curry similarly describes “[a]n embedded accelerometer and a GPS

receiver are included in [a] wireless device.” USAA-1006, 3:6-7.⁶ A POSITA

would have understood there to be no need to use data from vehicle sensors to derive driving information and would have found obvious that derivation of that driving information without data from the vehicle’s sensors provides an elegant and cost-effective means of obtaining driving information, without the complexities and costs that might potentially be involved in obtaining and integrating data from a vehicle’s sensors. *See* USAA-1003, ¶170.

[1.9]

The CCT phone is configured to send (*transmit*) at least some of its derived driving information (*at least some selection of the derived driving information*) to insurance provider system 4035 (*remote data-logging server*) for further processing, e.g., insurance rate calculations. As discussed above, the information sent to the insurance provider system 4035 may identify various types of *driving incidents* recited in [1.7], such as an accident event (*vehicle accident*), “abnormal acceleration” (*harsh acceleration*), “abnormal deceleration” (*harsh braking*), and “taking sharp turns” (*harsh swerving*). *See* USAA-1007, 2, 8-10; USAA-1006,

⁶ In the FWD issued in IPR2023-00518, the Board found this express disclosure in Curry sufficient to satisfy similar claim language requiring that “the driving information is derived without data from vehicle sensors.”

3:24-4:6. This is consistent with Callopy, Curry, and Thompson, each of which teach a mobile phone providing data monitoring functionality through communicating derived information to an associated server. USAA-1005, [0307]; USAA-1006, 8:21-27, 9:23-28; USAA-1007, 2-3. Thus, the CCT phone is similarly configured to *derived driving information including the driving incident* to the insurance provider system 4035. See USAA-1003, ¶¶171-72.

[1.10]

Callopy-Curry-Thompson renders [1.10] obvious. As discussed above, insurance provider system 4035 (*remote data-logging system*) is configured to store derived driver information generated by the CCT phone (*derived driving information received from the mobile telecommunications device*). Further, as noted in [1.5], examples of such information include “information regarding driver 4010’s driving skills, habits, etc.” (USAA-1005, [0307]), information identifying “talking...or texting...while driving” (USAA-1006, 7:5-29), and “speeding, abnormal acceleration, abnormal deceleration, and taking sharp turns” (*id.*, 3:24-4:6). USAA-1003, ¶173.

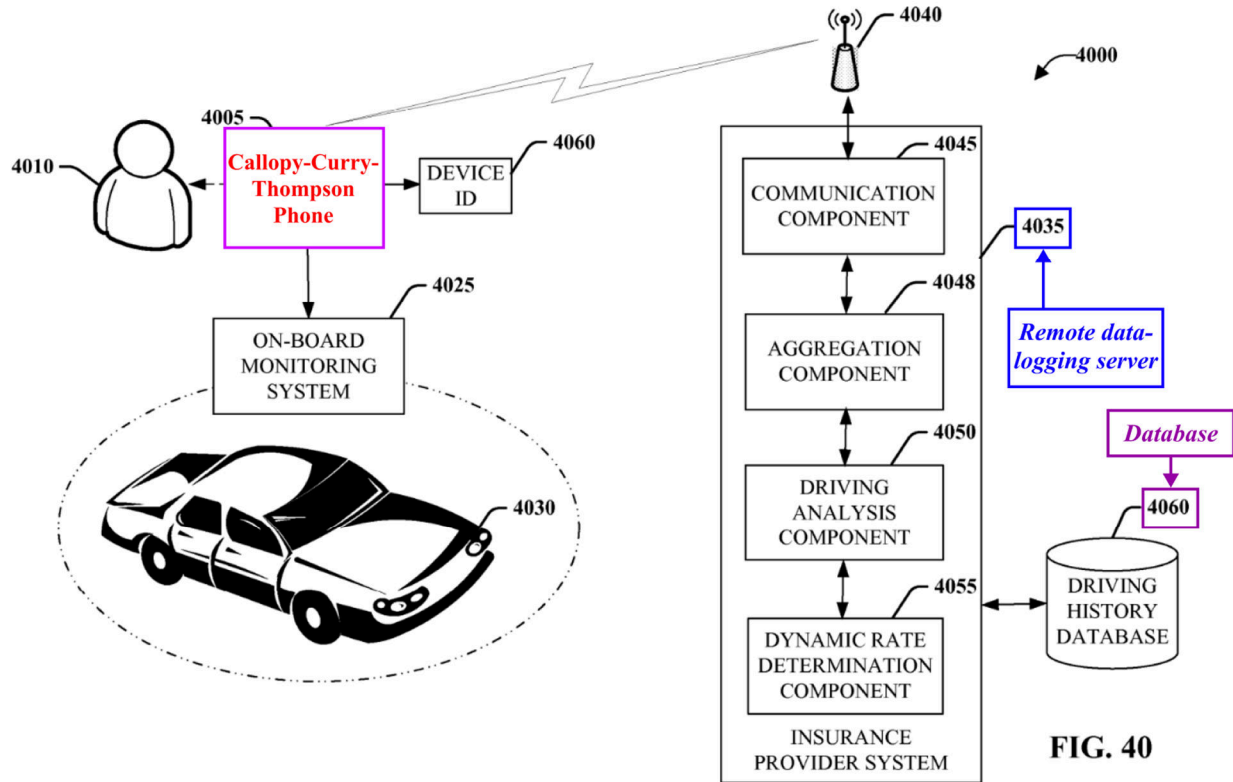
Indeed, Callopy teaches that insurance provider system 4035 store “any information gathered or generated by the various components of system 4000,” including “information provided by operator 4010” and “information retrieved from the mobile device 4005,” among others. USAA-1005, [0309]. Further,

various information can be obtained and/or processed by the mobile device 4005 (and its various components) and retrieved from the insurance provider system 4035. *Id.*, [0323]-[0324], [0330], [0346], [0347], [0388]. For example, using an “interface associated with ... the mobile device 4005, the user can respond” to user prompts and provide feedback that is gathered. *Id.*, [0346]; USAA-1003, ¶¶174-75.

[1.11]

Insurance provider system 4035 (***data-logging server***) includes a database (e.g., database 4060, storage device 4250) (***database***) that “stores information pertaining to the vehicle operator 4010, e.g., previous driving history, along with other data as required.” USAA-1005, [0308]; *see id.*, [0332]. A POSITA would have understood and found obvious that the database stores driver account information for a multiple users (***storing a plurality of accounts***) because Callopy teaches using identifiers to identify specific drivers. *See, e.g., id.*, [0317]; USAA-1003, ¶176.

One example of the database discussed above is shown in the annotated Figure 40 below:



USAA-1005, FIG. 40 (annotated)

USAA-1003, ¶177.

Another example of the database is shown in the annotated Figure 42:

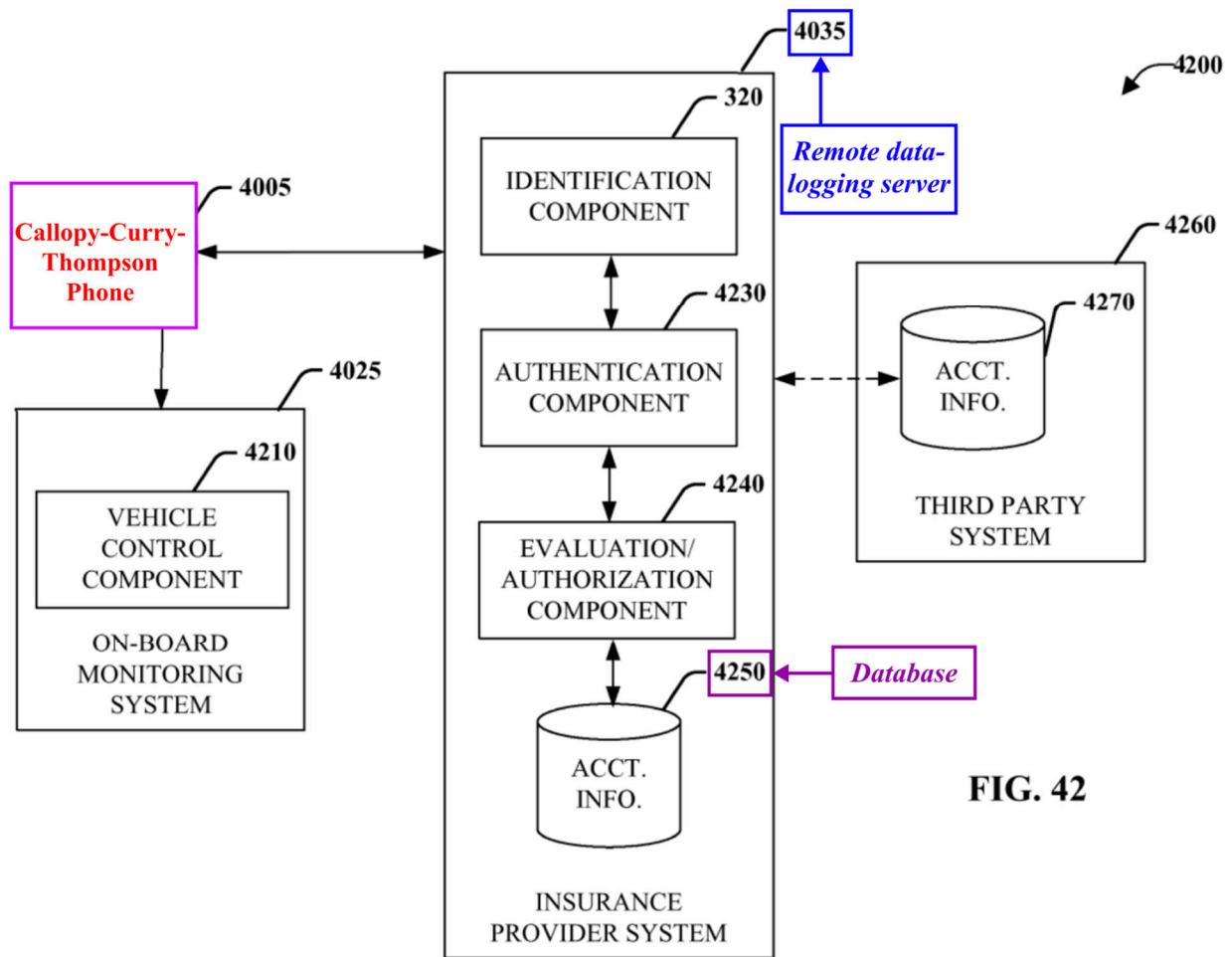


FIG. 42

USAA-1004, FIG. 42 (annotated)

USAA-1003, ¶178.

Data stored in the database includes “driver account information” to “identify a driver and control their operation of a vehicle as required.” USAA-1005, [0332]. Specifically, an “identification component 4220” accesses the database to “retrieve any user account information contained therein that is associated with the IMSI number, and, using the retrieved information, identify the user associated with the mobile device 4005 and accordingly the prospective driver

of vehicle 4030.” *Id.*, [0333]. Thus, one of the accounts stored in the database (*at least one of the plurality of accounts*) includes an identifier (e.g., IMSI number) (*unique identifier*). USAA-1003, ¶179. This identifier is used to “identify an individual, associated with mobile device 4005 and driver data” stored in the database. USAA-1005, [0334].

The database is also “employed to store any information gathered or generated by the various components of system 4000[,]” including “information retrieved from the mobile device 4005 or information associated therewith.” USAA-1005, [0309]. Thus, in Callopy-Curry-Thompson, the database is configured to store data deriving information generated by the CCT phone and associated with a driver (*the selection of the derived driving information transmitted from the from the mobile telecommunications device to the at least one account*). As noted for [1.5], this information may include “information regarding driver 4010’s driving skills, habits, etc.” (USAA-1005, [0307]) and “driving behavior” information, such as “talking...or texting...while driving” (USAA-1006, 7:5-29) and “speeding, abnormal acceleration, abnormal deceleration, and taking sharp turns” (*id.*, 3:24-4:6). USAA-1003, ¶180.

As discussed above, the driver data stored in the database (*derived driving information*) is associated with an identifier (e.g., IMEI number) (*unique identifier*). USAA-1005, [0332]-[0334]. The identifier corresponds to an

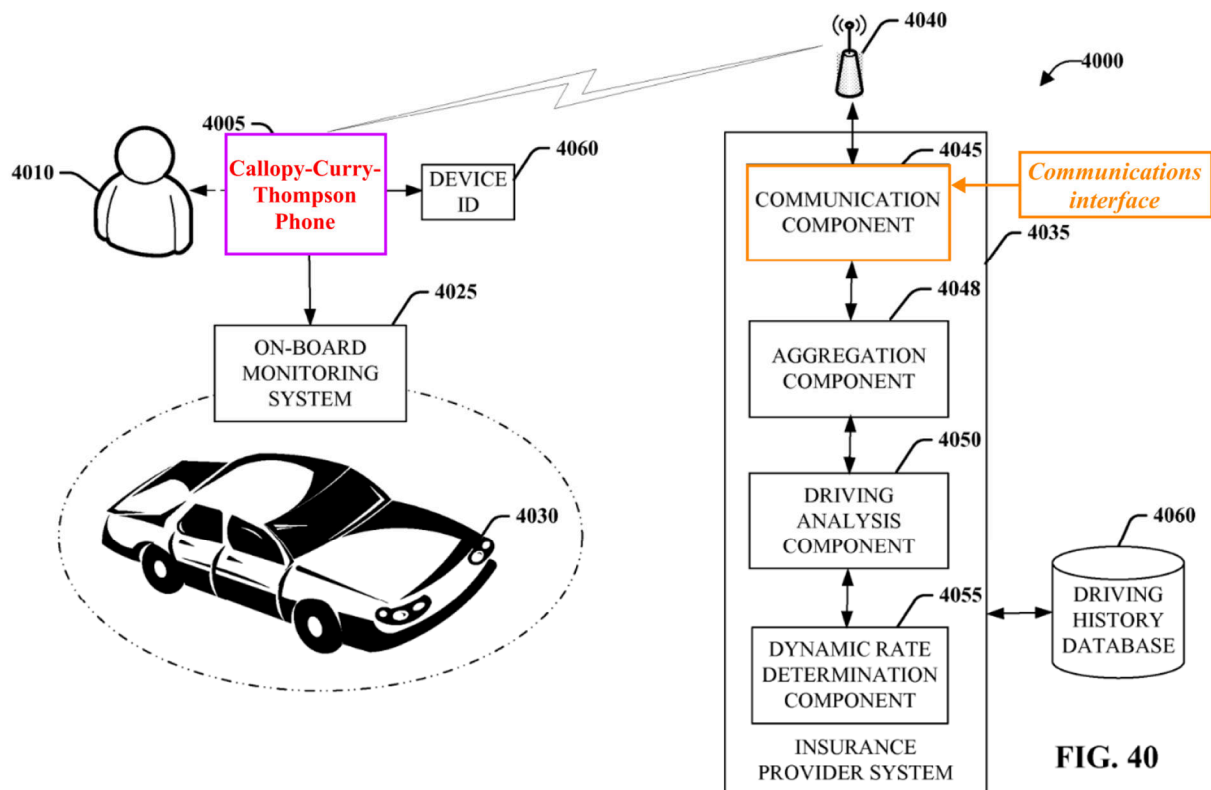
associated vehicle and a driver (*the vehicle and the driver*) since the insurance provider system 4035 uses the identifier to “retrieve any user account information” and then use the retrieved information to identify “the user associated with the mobile device 4005 and accordingly the prospective driver of vehicle 4030.” *Id.*, [0333] (emphasis added); USAA-1003, ¶181.

Further, Callopy describes that “[a] range of methods and systems can be utilized to allow a driver to be associated with a vehicle.” USAA-1005, [0317]. Specifically, the insurance provider system 4035 stores a unique identifier (e.g., IMSI number) (*each account having a unique identifier*) retrieved from a mobile device that is used to identify “an individual[] associated with mobile device 4005 and driver data stored in database 4250.” *Id.*, [0333]-[0334]. As such, a POSITA would have understood that Callopy’s database stores driver account information for a multiple users (*storing a plurality of accounts*) that are used to identify a particular driver. USAA-1003, ¶182.

[1.12]

Insurance provider system 4035 (*data-logging server*) includes a communication component 4045 (*communications interface*) configured to communicate with and receive information from the CCT phone (*mobile telecommunications device*). Callopy explains that “[b]y employing wireless communications, the mobile device 4005 is in communication with [the] insurance

provider system 4035 via a transceiver 4040 and a communication component 4045.” USAA-1005, [0307]; *see also id.*, FIGS. 40-42. Additionally, Callopy’s Figure 59 shows interfaces for communicating with remote computers. *Id.*, [0443]-[0445], FIG. 59. Given that the mobile device 4005 and the insurance provider system 4035 can communicate, it would have been obvious to a POSITA that the insurance provider system 4035 includes a communications interface arranged to communicate with the mobile device 4005. USAA-1003, ¶183; USAA-1005, [0307]- [0308], [0322], [0329].



USAA-1005, FIG. 40 (annotated)

[1.13]

As discussed for [1.12], in Callopy-Curry-Thompson, the database of the insurance provider system 4035 includes an identifier (e.g., IMSI number) (*unique identifier*). USAA-1005, [0332]-[0334]. The identifier is used to identify driver data for a vehicle and driver, including derived driving information generated by the CCT phone, and thus, is *for association of the mobile telecommunications device with the at least one of the plurality of accounts*. *Id.*; USAA-1003, ¶¶184-85.

[1.14]

Callopy-Curry-Thompson renders this limitation obvious. As discussed above for [1.10]-[1.13], in the combination, insurance provider system 4035 receives derived driving information generated by the CCT phone and stores the received information as driver data in a database. The stored information is associated with an identifier to allow identification of an associated vehicle and driver. Thus, at least some of the information received from the CCT phone (*at least some of the derived driving information transmitted from the mobile telecommunications device*) is stored to (*logged to*) an account specified in the database (*at least one of the plurality of accounts*). USAA-1005, [0309], [0323], [0324], [0330], [0332]-[0334], [0346], [0388]; USAA-1003, ¶¶186-87.

b) Claim 2

[2.1]

The CCT phone stores accelerometer data (*raw sensor data relating to the*

driving incident) locally. In Curry, “data can be recorded to a local motion data cache 118 for further processing.” USAA-1006, 8:30-9:3. Thompson similarly describes mobile device instructions that cause the device to store raw sensor data related to an accident. USAA-1007, 2, 7; *id.*, 9 (“WreckWatch recorded acceleration on three axes at the highest possible rate and wrote these values to a CSV file on the SD card in the device.”). The data stored includes accelerometer readings (forces experienced in different directions), GPS location and speed data, and timestamped event logs for later accident reconstruction. USAA-1003, ¶¶188-90.

[2.2]

See [1.9]. The CCT phone is configured to transmit both processed sensor data and raw values used for processing (*stored raw sensor data*) to the insurance provider system 4035 (*data-logging server*). Curry describes that its mobile device uses “mobile phone communication links” to transmit “motion data and activity mode estimation results of a user” to a “driving safety data server 104.” USAA-1006, 9:23-28. In Curry, because “local data cache can be used to store raw data for an extended time period of time,” a POSITA would have found it obvious to configure the CCT phone to transmit raw data to a server. *Id.*, 8:30-9:3. Such a configuration also promotes the broad objective of Callopy and Curry of using recorded sensor data relating to driving to improve insurance rate

determinations (e.g., by making more data available to the server for rate determinations). USAA-1005, [0017]-[0018]; USAA-1006, 4:7-15, 11:26-12:2; USAA-1003, ¶191.

c) Claim 3

[3]

See [2.1]. The CCT phone is configured to collect sensor data in *before*, *during*, and *after* a vehicle accident (*driving incident*) based on the teachings Thompson and Curry. In Thompson, a smartphone is configured to record “the path, speed, and forces of acceleration on a vehicle leading up to and during an accident.” USAA-1007, 2. Further, because Thompson’s technique involves accident detection based on comparison to a threshold, a POSITA would have found it obvious that the collection of acceleration values is *continuously collected, and associated with the driving incident.* USAA-1007, 8 (“WreckWatch uses the smartphone’s GPS to determine device and (consequently) vehicle speed”). Relatedly, Curry describes that a local data cache on a mobile device can “store raw data for an extended time period of time in order to provide sufficient information for a user activity mode recognition program 120.” USAA-1006, 8:30-9:3; *see id.*, 16:7-22; USAA-1003, ¶192.

d) Claim 4

[4]

Callopy-Curry-Thompson renders [4] obvious. In Thompson, a smartphone

is configured to initiate recording of sensor data (*register a start of the driving period*) once a vehicle speed is “above 15 mph.” USAA-1007, 8. A POSITA would have understood that using a threshold vehicle speed to initiate data collection is an example of an *initialization input generated automatically in response to the raw sensor data having predetermined values*. USAA-1003, ¶193. This understanding is consistent with the specification, which describes that “if the sensor data reflects a detected speed above a predetermined threshold—for example, 20 kilometers per hour—then this can be used to trigger the start of the driving period. USAA-1001, 3:40-4:2.

B. [GROUND 2] – Callopy-Curry-Thompson-Warren Renders Claim 5 Obvious

1. Proposed Combination

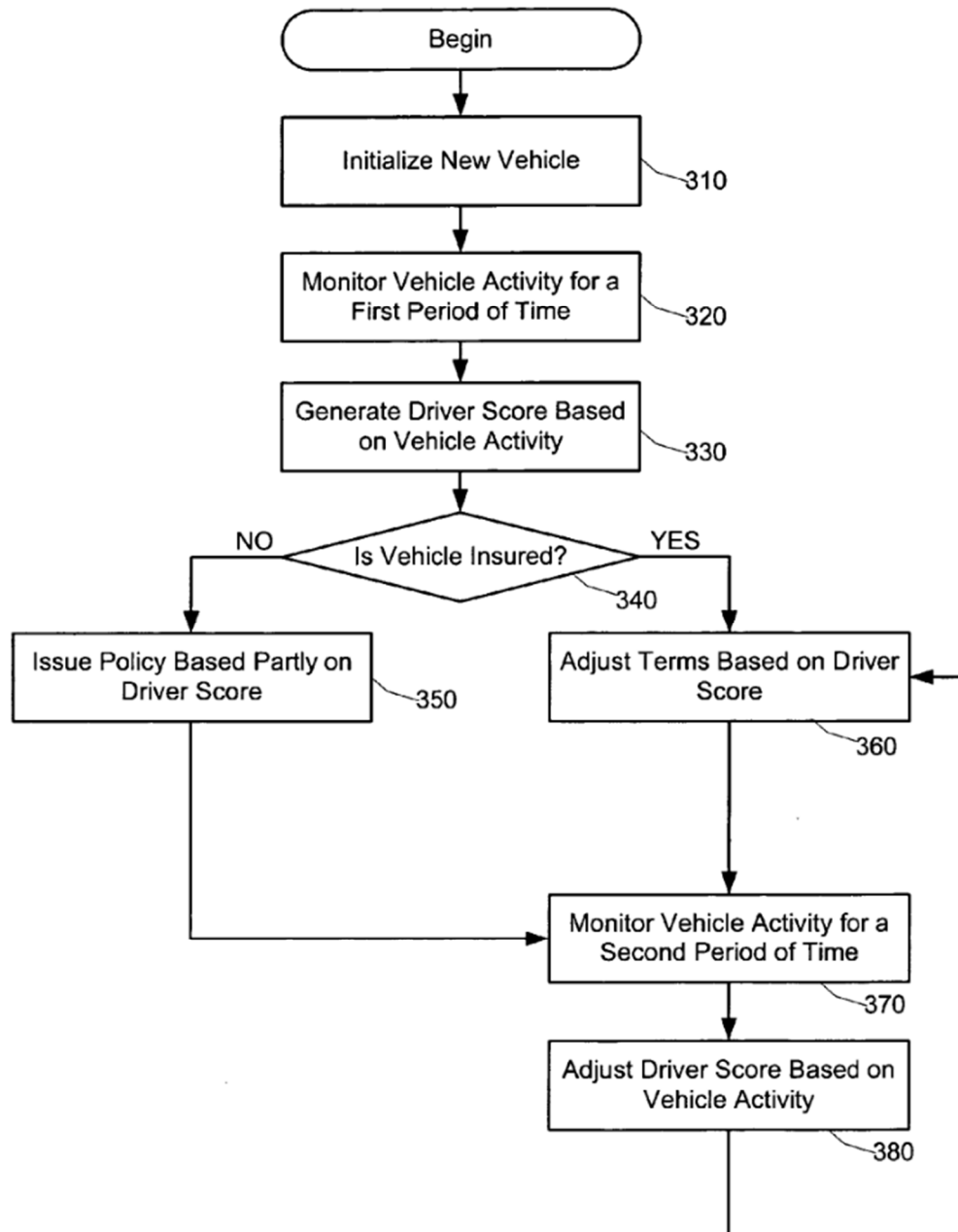
a) Warren

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-1008, 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, ¶86. The driver score reflects “a risk level associated with insuring a particular driver[,]” (USAA-1008, [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-1008, [0024].

An example of the process of determining a driving score is shown in Figure

3:



USAA-1008, FIG. 3

As shown above, at step 310, “a new vehicle is selected for driver score based insurance.” USAA-1008, [0049]. Upon initialization, the system “begins to monitor the vehicle activity for a first period of time 320.” *Id.*, [0050]. The period of monitoring is “sufficiently long to obtain data that is an accurate portrayal of the vehicle activity,” including “a shorter period of time that encompasses enough variants in the individuals schedule.” *Id.*, [0050]. Once this period has been “satisfied,” “a variety of parameters with various weights applied to the parameters” are used to determine a driver score. *Id.*, [0051]; USAA-1003, ¶88.

b) Callopy-Curry-Thompson-Warren

As discussed in §III.A.1, Callopy-Curry-Thompson provides a comprehensive system for monitoring driving behavior and generating insurance risk assessments. A POSITA seeking to implement this system would have sought enhance risk assessment methodologies based on Callopy’s suggestion that “[t]he automobile insurance industry has been exploring ways in which it can take advantage of information about a vehicle’s location, conditions of operation, and other factors, to assess risk dynamically and thereby adjust insurance rates.” USAA-1004, [0010]. This would have predictably led the POSITA to the teachings of Warren as a result. USAA-1003, ¶195.

Warren describes techniques that offer nuanced approaches to risk

assessment through calculation and adjustment of driving scores that span multiple recording periods. USAA-1008, [0024], [0050]-[0056]. As noted in §III.B.1(a), in Warren, an overall period of monitoring is “sufficiently long to obtain data that is an accurate portrayal of the vehicle activity,” including “a shorter period of time that encompasses enough variants in the individuals schedule.” *Id.*, [0050]. Once this period has been “satisfied,” “a variety of parameters with various weights applied to the parameters” are used to determine a driver score. *Id.*, [0051]; *see id.*, FIG. 3. A POSITA seeking to refine and broaden the Callopy-Curry-Thompson system would be motivated to incorporate Warren’s scoring techniques to provide improved insurance offerings, consistent with Callopy’s objectives of “optimizing insurance from the perspective of both the insurance provider and the insurance purchaser.” USAA-1005, [0014]; USAA-1003, ¶196.

In incorporating Warren’s teachings into Callopy-Curry-Thompson, a POSITA would have introduced logic relating to Warren’s iterative scoring modules into the CCT phone. USAA-1003, ¶172. This allows a phone of Callopy-Curry-Thompson-Warren (“CCTW phone”) to calculate and adjust driving scores at intervals determined by usage patterns, changes in driving behavior, or detection of major events such as accidents. *See* USAA-1008, [0050]-[0055]. The CCTW phone thereby leverages existing sensors described in Callopy, Curry, and Thompson (e.g., GPS, accelerometer) to feed driving information into Warren’s

scoring module. *See* USAA-1008, [0014], [0023]-[0024]. This configuration also enables forward-looking and retroactive adjustments to insurance terms based on accumulated scores, as taught in Warren, thereby complementing the dynamic insurance rate assessments suggested in Callopy and Curry. *Id.*, [0012], [0055]; USAA-1003, ¶197.

The resulting Callopy-Curry-Thompson-Warren system yields several predictable and beneficial results resulting to insurance offerings contemplated in Callopy and Curry. USAA-1003, ¶198. Warren teaches that continuously updated driver scores lead to more accurate insurance policy adjustments, aligning closely with Callopy's objective of risk-based pricing and real-time driver monitoring. *See* USAA-1005, [0004], [0307], [0321]. A POSITA would have thereby recognized that Warren's mechanism for aggregating risk data over time with the accident detection capabilities of Thompson and the real-time driving data analysis of Callopy and Curry predictably achieve a more robust, data-driven insurance framework. USAA-1003, ¶198. Incorporation of Warren's scoring techniques would have further enabled refined risk profiles, continuous feedback to insured parties, and improved insurance product offerings. *Id.*, ¶199.

A POSITA would have had more than a reasonable expectation of success when incorporating Warren's teachings into Callopy-Curry-Thompson. USAA-1003, ¶200. Each of the references share common sensor technologies (GPS,

accelerometers), similar goals of driver risk assessment, compatible mobile device architectures, and complementary approaches to processing driving information. A POSITA would have perceived such incorporation to represent nothing more than applying a known technique (e.g., Warren’s driving score techniques) to a known system (e.g., mobile devices with accelerometers and GPS sensors, as described in Callopy, Curry, and Thompson) to improve a similar device in a predictable way. *KSR*, 550 U.S., at 417; USAA-1003, ¶¶201-04.

2. Claim 5

[5]

Callopy-Curry-Thompson-Warren renders this claim obvious. In the combination, the CCTW phone is configured to process driving behavior information (*derived driving information*) collected over a time frame to determine a driving score (*aggregated driving score*). USAA-1008, [0024], [0051]-[0054], FIG. 3. The driving score “operates to establish a risk level associated with insuring a particular driver” and thereby is *used to determine a risk profile for...the driver*. *Id.*, [0024] (the driving score also “reflects a qualitative view of the driving characteristics for a particular vehicle or a combination of a vehicle and driver”); USAA-1003, ¶205.

A POSITA would have found it obvious that the driving score generated by the CCTW phone based on processing of deriving driving information collected

over a plurality of driving periods, including the driving period. USAA-1003,

¶206. Warren explains that “the monitoring and recording system begins to monitor the vehicle activity for a first period of time 320.” USAA-1008, [0050].

The period of time 320 includes multiple recording periods (*plurality of driving periods*) because its length is “sufficiently long to obtain data that is an accurate portrayal of the vehicle activity.” *Id.* Because “a two to four week period of time may be sufficient if during that period of time,” a POSITA would have understood and found obvious that multiple vehicle journeys may be performed within the period of time 320. USAA-1003, ¶207. Thus, “[o]nce the first period of time has been satisfied,” and the CCTW phone “generate[s] the driver score 330,” the score reflects an *aggregated driving score* as far as its value reflects the aggregation of driving behavior information collected for multiple vehicle journeys that occur within the period of time 320. USAA-1008, [0051]; USAA-1003, ¶¶207-08.

C. [GROUND 3] – Callopy-Curry-Thompson-Katayama Makes Claims 6-28 Obvious

1. Proposed Combination

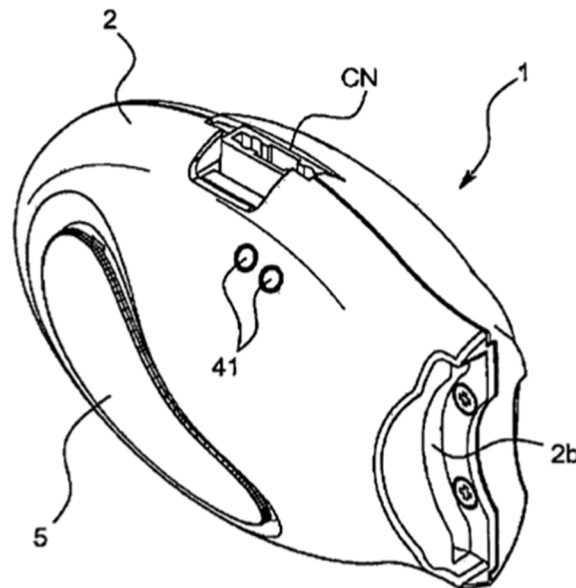
a) Katayama

Katayama describes a “driving recorder” that records “situation data” that indicates the “surrounding situation or the like of a motor vehicle during a certain period before and after a time of an accident or...risk incident” in which “a driver...is close to [being] involved in an accident....” USAA-1009, [0001],

[0011], [0058]; USAA-1003, ¶89.

Through “after-the-fact analysis” of recorded data, the recorder can, for example, provide insights into driving behavior that may have contributed to the occurrence of a given accident or “risk incident.” USAA-1009, [0001][0002]; USAA-1003, ¶90.

Figure 2 (below) shows an exemplary driving recorder 1.



USAA-1009, FIG. 2

Recorder 1 detects occurrence of accidents and/or risk incidents based on “situation data” that includes both sensor data and information derived therefrom, including “acceleration data indicating acceleration applied to a vehicle, [and] position data indicating a position of the vehicle....” USAA-1009, [0013]; USAA-1003, ¶91.

Figure 4 (below) depicts components of an exemplary recorder 1, including

both internal accelerometer and GPS sensors and an “internal memory 82” that is configured to store sensor data and related derived information. USAA-1009, [0034], [0044]; USAA-1003, ¶92.

G

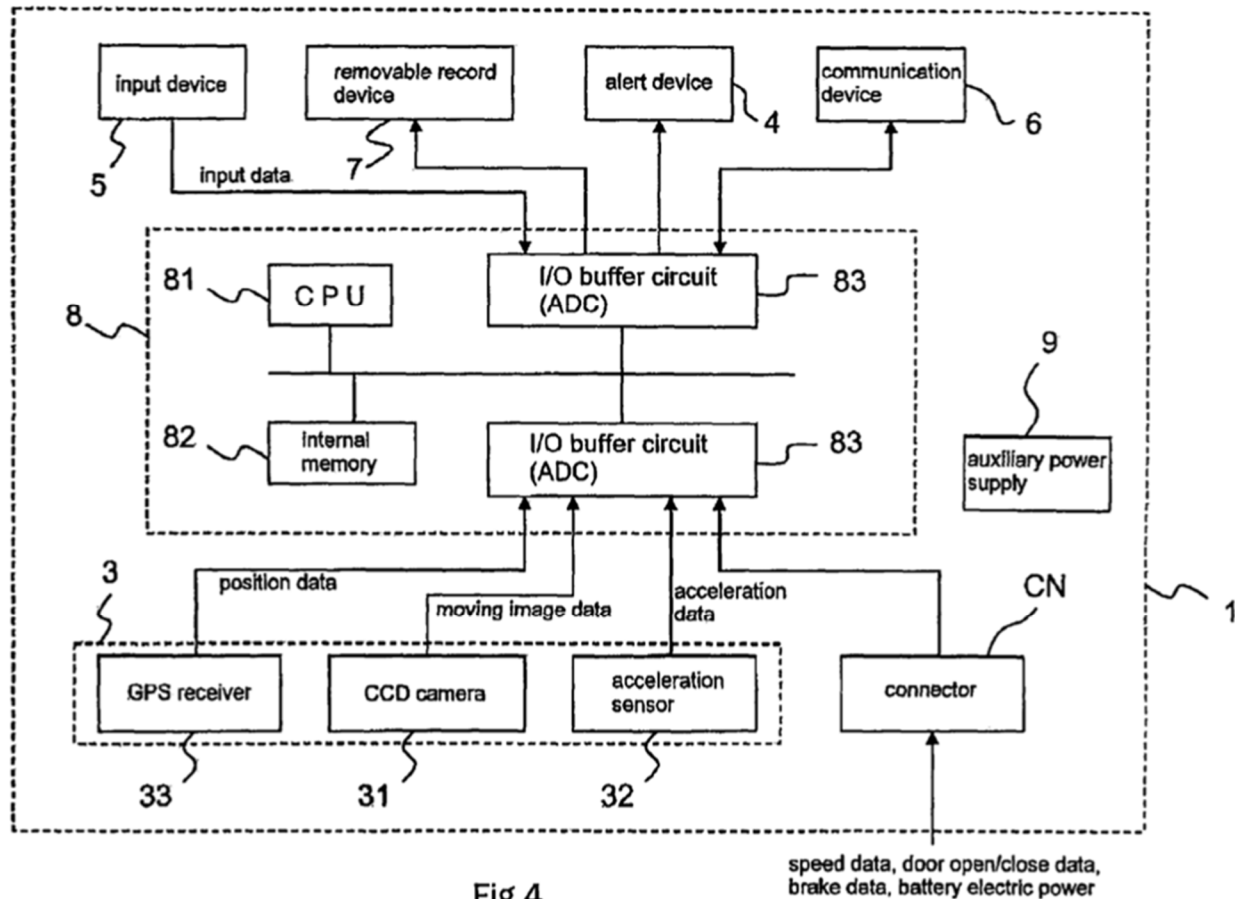
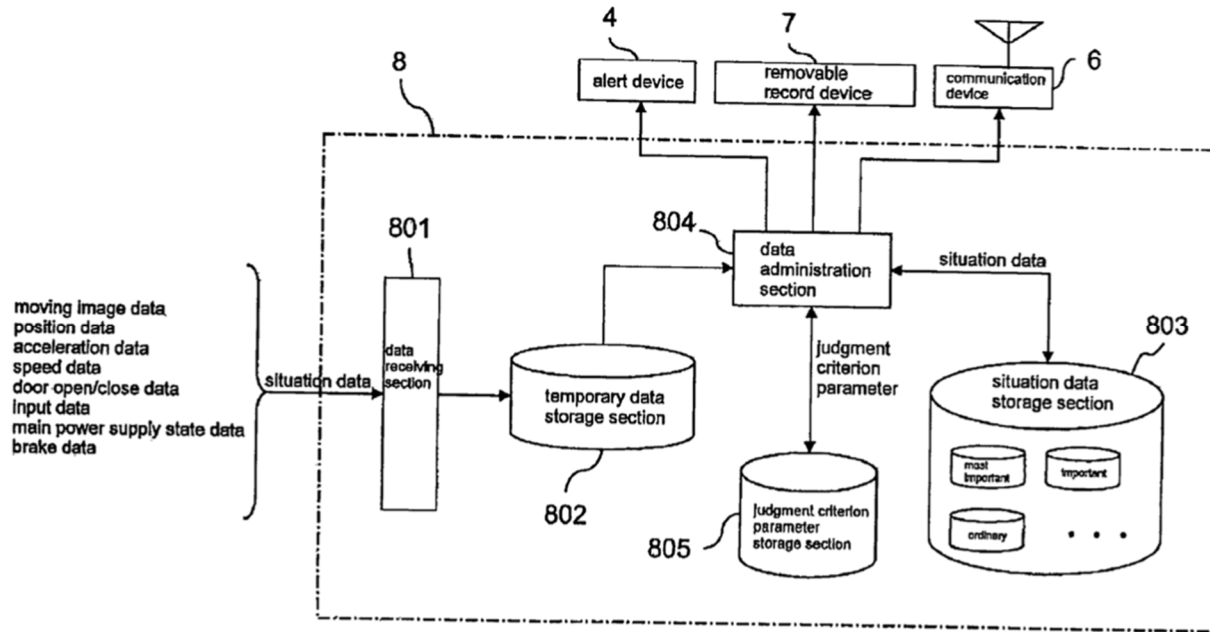


Fig.4

USAA-1009, FIG. 4

Figure 5 (below) is a “functional block diagram” of the recorder. USAA-1009, [0028], [0044]-[0045]. As shown, the recorder “is controlled...by operating the CPU 81 in accordance with programs stored in a predetermined area of the internal memory 82.” USAA-1003, ¶93.



USAA-1009, FIG. 5

As described, memory 82 features an architecture with multiple sections, including “temporary data storage section 802” and “situation data storage section 803.” *Id.*, [0044]. Relatedly, Katayama describes data handling techniques that enable “effective use” of the memory’s limited capacity, and ensure that “important data will not be erased,” but instead will remain available for easy and accurate “after-the-fact analysis” of accidents and/or risk incidents. *Id.*, [0016]; USAA-1003, ¶94.

In more detail, data receiving section 801 receives “situation data” including sensor data “at a constant sampling time one after another in a chronological order and writes the received situation data” in memory 82’s temporary data storage section 802. *Id.*; USAA-1003, ¶95. Due to that area’s limited capacity, “old data

is sequentially erased” and replaced over time with “new situation data.” USAA-1009, [0045], [0016].

To avoid erasing situation data that might prove useful, data administration section 804 determines at the “time of recording” whether temporarily stored situation data meets one or more predetermined criteria for long term storage. USAA-1009, [0001]-[0002], [0016], [0046]-[0050]; USAA-1003, ¶96. If so, the recorded situation data is, for example, classified with an identifier marking it as “important,” and then transferred with the identifier to long term “situation data recording section 803.” *See* USAA-1009, [0001]-[0002], [0011]-[0016], [0027], [0046]-[0050], [0054], [0083]. In contrast, situation data that is marked with an identifier as less than important remains in temporary storage until eventually overwritten. *See* USAA-1009, [0011]-[0016], [0054].

Criteria used in determining whether to mark and/or transfer a given set of accelerometer data may include, for example, “whether or not the acceleration” indicated exceeds a “predetermined” threshold, and “whether or not the acceleration continues for more than or equal to a certain period [of time].” USAA-1009, [0011]-[0016], [0027], [0046]-[0050], [0054], [0083]; USAA-1003, ¶97.

To enable these and other determinations to take place, “the value (the content) of each situation data is, for example, digitalized in accordance with the

judgment criterion parameter” or parameters against which it will be compared, and the resulting “digitalized” values are temporarily stored. See USAA-1009, [0047][0049]; USAA-1003, ¶98. “[W]hether or not the content of each situation data meets” a “predetermined condition” for marking and/or transfer may then be judged based on logical comparisons between the stored values and the corresponding parameter(s). USAA-1009, [0049].

b) Callopy-Curry-Thompson-Katayama

As explained below, a POSITA would have found obvious enhancement of the CCT phone through implementation both of Katayama’s teachings on partitioning local memory into several sections (including sections for temporary and long term storage), and Katayama’s related teachings on data handling. USAA-1009, [0012], [0015], [0048], [0049]. This includes both the comparison at the time of recording of digitalized sensor data against judgment criteria representative of specific driving behaviors, and storage in appropriate sections of memory of digitalized data with metadata identifiers indicating determinations made through those comparisons. USAA-1009, [0012], [0015], [0048], [0049]; USAA-1003, ¶¶209-10. The resulting phone provided by Callopy-Curry-Thompson-Katayama (CCTK phone) embodies these and other advantages discussed below.

In more detail, a POSITA would have found obvious that, like Katayama’s

local memory 82, the local memory featured in the CCTK phone has limited capacity for accommodating both continuously and sequentially received sensor data, and information derived therefrom. *See* USAA-1005, [0330]; USAA-1006, 6:3-10, Fig. 1; USAA-1003, ¶211. Curry explains, for example, that “mobile phone client 110 can record location, speed and acceleration data from sensors embedded in the wireless device...to a local motion data cache 118 for further processing” prior to later transmission of derived driving behavior information. USAA-1006, 8:30-9:3; *see id.*, 3:24-4:6, 7:5-22, 8:20-27, 13:20-15:6, Figs. 1, 3. Accordingly, a POSITA would have found obvious that derived driving behavior information is stored in local memory prior to its later transmission. USAA-1003, ¶212; USAA-1006, 7:5-22, 8:29-9:28, 13:20-15:6, Fig. 3.

As such, a POSITA would have recognized that important information stored in Curry’s local memory is subject to the risk of being inadvertently erased and overwritten with new data, and would have recognized in Katayama’s teachings a solution that could be readily applied in the context of the CCT phone: partition of the local memory into temporary and long term sections, with storage of information identified as important in the long term section. USAA-1003, ¶213; USAA-1009, [0001]-[0002], [0016], [0044]-[0051], [0057].

Further, a POSITA would have recognized that configuring the CCTK phone’s memory in this manner while applying Katayama’s related data storage

techniques would “enable[] effective use of the memory without erasing important situation data” and “eliminat[e] accumulation of useless data,” while at the same time furthering Curry’s goals of “detect[ing] and prevent[ing] unsafe driving behavior[s]” by enabling the CCTK phone to detect both accidents and “risk incidents.” USAA-1006, Abstract, 2:1-27, 3:24-4:6, 4:7-11, 7:5-22, 9:31-33, Fig. 1; USAA-1009, [0016], [0053], [0044], [0046]; USAA-1003, ¶218.

More specifically, and as taught by Katayama, the POSITA would have configured the CCTK phone to receive “situation data” including sensor data “at a constant sampling time one after another in a chronological order,” and to write “the received situation data” in a temporary data storage section within the CCTK phone’s local memory. USAA-1009, [0016], [0044]-[0049]; USAA-1003, ¶219. To avoid erasure of important situation data, the POSITA would have further configured the phone to “digitalize” temporarily stored situation data for purposes of determining, at the “time of recording,” whether that digitalized situation data meets predetermined criteria for long term storage (for example, whether a value of temporarily stored digitalized accelerometer data exceeds a predetermined threshold). USAA-1009, [0001]-[0002], [0011]-[0016], [0027], [0046]-[0050], [0054], [0083]; USAA-1003, ¶¶219-20.

Further, the POSITA would have configured the CCTK phone to record situation data determined to be “important” with a metadata “identifier” marking it

as such, and to transfer situation data with the identifier from the local memory's temporary storage to its long term section. USAA-1009, [0001]-[0002], [0011]-[0016], [0027], [0046]-[0050], [0054], [0083]; USAA-1003, ¶221. And, again consistent with Katayama, the POSITA would have configured the CCTK phone to store situation data determined to be less than important with a metadata "identifier" marking it as such, until overwritten. USAA-1009, [0011]-[0016], [0054].

These among other advantages would have amply motivated a POSITA to integrate Katayama's teachings into the CCT phone. USAA-1003, ¶¶212, 222; USAA-1006, 3:2-15, 3:24-4:6, 7:30-8:2; USAA-1009, [0001]-[0002], [0011]-[0016], [0027], [0044]-[0050], [0054], [0083]. For example, a POSITA would have expected these enhancements to produce benefits including:

- 1) more effective use of the CCTK phone's local memory (USAA-1003, ¶212; USAA-1006, 3:2-15, 3:24-4:6; USAA-1009, [0014]-[0016], [0045], [0053]);
- 2) avoidance of inadvertent erasure of important information (USAA-1003, ¶213; USAA-1009, [0001]-[0002], [0016], [0045]-[0050]); and
- 3) generation of more sophisticated and accurate user driving scores derived from information further indicating whether a driver may have been involved in an accident or "risk incident" (USAA-1003, ¶214; USAA-1006, 7:5-22, 9:31-33, 10:3-12, 11:3-14, 13:3-19; USAA-1009, [0044]-[0046])

- 4) enhanced utility for third parties in leveraging the CCTK phone's improved driving scores (USAA-1003, ¶¶215-16; USAA-1006, 4:7-11, 7:5-22, 10:3-12, 11:26-12:2)

Moreover, configuring the CCT phone to leverage Katayama's teachings would have required only routine knowledge of programming and common electronic components—well within the skill of a POSITA prior to the Critical Date. USAA-1003, ¶223. The changes would have amounted to nothing more than the use of known techniques to improve similar devices. In each instance, a device for recording and analyzing driving information equipped with a sensor set and a form of electronic storage is improved in a similar way such that implementation of Callopy-Curry-Thompson-Katayama involves combining prior art elements according to known methods to yield the predictable results described above. *KSR*, 550 U.S. at 417; USAA-1003, ¶¶224-29.

2. Claims 6-28

a) Claim 6

[6.1]

Callopy-Curry-Thompson-Katayama renders [6.1] obvious. The CCTK phone collects and processes sensor data during a time period when a vehicle is being driven (*driving period*). *See* [1.1]. Sensor data is collected based on the storage architecture and techniques described in Katayama. USAA-1003, ¶230. In Katayama, sensor data is collected and stored sequentially in temporary data

storage section 802 “at a constant sampling time one after another in a chronological order.” USAA-1009, [0045].

A POSITA would have understood and found obvious that continuously sampling data at a defined frequency involves segmenting collected data for a driving period into discrete blocks. USAA-1003, ¶231. Data representing each block point arrives on a fixed schedule (for example, every few milliseconds or seconds), such that a block represents a sampling period from a start point to an end point. *Id.*; USAA-1009, [0045]. Because a driving period includes multiple blocks, recorded sensor data for a driving period includes multiple time sampling periods (*plurality of portions of time throughout the driving period*). *Id.*

Katayama confirms this understanding since “situation data **during a certain period** is transferred from the temporary data storage section 802 to the situation data storage section 803 only after the driver determines the situation as the hiyari hatto (risk incident),” suggesting the capability of its system to recognize periods of time associated with recorded sensor data. USAA-1009, [0051]; *see* USAA-1003, ¶232.

[6.2]

Callopy-Curry-Thompson-Katayama renders [6.2] obvious. The CCTK phone detects incidents (e.g., accidents) based on locally processing sensor data. *See* [1.7]. In Katayama, event-specific data is preserved and ultimately

transmitted, rather than continuously transmitting the entire drive's recordings.

USAA-1009, [0046]. By storing only the data that includes the event timeframe, the CCTK device similarly *select[s] a portion of time related to the driving incident* of captured data. USAA-1003, ¶233. Further, as discussed for [1.9], the CCTK phone is configured to transmit (*transmit*) the selected information (e.g., accident-related information) to insurance provider system 4035 (*remote logging server*) for further analysis, consistent with the teachings of Callopy, Curry, and Thompson. USAA-1005, [0307]; USAA-1006, 8:21-27, 9:23-28; USAA-1007, 2-3, Fig. 2.

Further, a POSITA would have found it obvious that the configuration of the CCTK phone (based on Katayama's storage techniques and architecture) *reduce[s] the amount of data transmitted*. USAA-1003, ¶234. In Katayama, section 803 only stores "situation data whose content meets the predetermined condition," thereby reducing the amount of available data that, in Callopy-Curry-Thompson-Katayama, is transmitted to a server. USAA-1009, [0046]. A POSITA would have further recognized that transmitting only that incident-linked data to the server involves less data than sending the entire driving record. USAA-1003, ¶235.

b) Claim 7

[7]

See [1.7]. The CCTK phone is configured to detect a vehicle accident (*driving incident*) by comparing values specified in accelerometer data to an acceleration threshold (e.g., 4g measured acceleration). USAA-1007, 8. Thus, when an accident is detected during a time period when a vehicle is being driven and includes multiple sampling periods (*at least a portion of the plurality of portions of time during the driving period*), the detection is based on changes in acceleration values over time (*a change of the raw sensor data*). USAA-1003, ¶236; USAA-1009, [0046]. Thompson describes that when a smartphone is placed in a vehicle, “the smartphone would experience the same forces as vehicle occupants,” and thus acceleration measurements characterize *motion of the vehicle* during the time period when a vehicle is being driven. USAA-1007, 7. Where measured acceleration values change over time and at least one measured value exceeds the threshold, this represents *a marked variation* indicative of a change in acceleration (*a difference in a state of motion*). USAA-1003, ¶237.

c) Claim 8

[8]

See [1.7], [1.9], [2.1], [3], [4]. A POSITA would have found it obvious that in certain implementations, the CCTK phone may be configured to transmit processed sensor data and raw values used for processing (*raw sensor data*) to the insurance provider system 4035 (*data-logging server*). USAA-1003, ¶238. A

POSITA would have found it obvious that transmission of raw values used for processing involves a *select[ing]* operation prior to the *trans[mission]* insofar as the CCTK phone determines that the information should be transmitted to the insurance provider system 4035. USAA-1003, ¶239.

d) Claim 9

[9]

See [1.9], [2.1], [3], [8]; USAA-1003, ¶240.

e) Claim 10

[10]

See [1.9], [2.2], [3], [8]; USAA-1003, ¶241.

f) Claim 11

[11]

Callopy-Curry-Thompson-Katayama renders [11] obvious based on Katayama's storage techniques, which involve a constant sampling rate for data collection and storage. *See* [6.1], [7]; USAA-1009, [0045]. A POSITA would have recognized a *five-minute time period* for sampling as a design choice because a sampling period represents one of multiple available options for collecting sensor data during a time period associated with driving. USAA-1003, ¶242; *see id.*, ¶245 (citing USAA-1050, 5); *see also* MPEP 2144.04.

Indeed, while the specification references sequential capture of recorded data “over a period of five minutes,” it otherwise does not explain why this specific

duration is superior to shorter or longer time frames. *See* USAA-1001, 18:3-29.

Further, because the specification does not teach that a five-minute duration as providing any functional advantage, a POSITA would have perceived the five-minute period as not producing any new or unexpected result over the storage techniques already described in Katayama. USAA-1003, ¶243. In Katayama, data is collected “during a certain period” and then “transferred from the temporary data storage section 802 to the situation data storage section 803,” thereby preventing excessive accumulation. *See* USAA-1009, [0045] (“If 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”). *See* USAA-1003, ¶244.

Indeed, as the Federal Circuit has explained, an obviousness determination based on design choice is appropriate where “applicant failed to set forth any reasons why the differences between the claimed invention and the prior art would result in a different function or give unexpected results.” *In re Chu*, 66 F. 3d 292, 298-99 (Fed. Cir. 1995) (citing *In re Rice*, 341 F.2d 309 (CCPA 1965) and *In re Kuhle*, 526 F.2d 553, 555 (CCPA 1975))).

g) Claim 12

[12]

See [1.10], [6.1], [6.2]. Callopy teaches that its database 4060 (incorporated into insurance provider system 4035) (***remote-logging server***) stores “any

information gathered or generated by the various components of system 4000,” including mobile device 4005. USAA-1005, [0309]. Insurance provider system 4035 stores accident-related information received from the CCTK phone, including sensor data relating to a detected accident (*raw data relating to the selected portion of time related to the driving incident*). USAA-1007, 2, 8-10; *see* USAA-1005, [0308], [0333], [0334]; USAA-1003, ¶¶246-47.

h) Claims 13, 24

Callopy-Curry-Thompson-Katayama renders independent claims 13 and 24 obvious in the same manner as explained above for corresponding claim 1 limitations listed in the table below. USAA-1003, ¶¶248-49.

Claim Limitation	Corresponding Claim 1 Limitation
[13.1], [24.1]	[1.1]
[13.2], [24.2]	[1.2]
[13.3], [24.3]	[1.3]
[13.4], [24.4]	[1.4]
[13.5], [25.5]	[1.5]
[13.7], [24.7]	[1.7]
[13.8], [24.8]	[1.8]
[13.9], [24.10]	[1.9]
[13.10]	[1.10]

[13.11], [24.12]	[1.11]
[13.12], [24.13]	[1.12]
[13.13], [24.14]	[1.13]
[13.14], [24.15]	[1.14]

[13.6], [24.6]

See [1.6], [6.1], [6.2]; USAA-1003, ¶250.

[13.15], [24.16]

Callopy-Curry-Thompson-Katayama satisfies these limitations based on teachings relating to risk assessments within Callopy and Curry. In Callopy, insurance provider system 4035 (*remote data-logging server*) is configured to “employ[] various analytical methods” “to facilitate determination of an appropriate insurance rate.” USAA-1005, [0307]. The goal of this analysis is to “determine a risk level associated with a driver or vehicle—based upon the risk level, an amount for the premium can be ascertained,” rendering obvious that the insurance provider system 4035 processes driving information to **determine a risk profile for...the driver**. *Id.*, [0004]; *see id.*, [0308] (“The system 4035 stores information pertaining to the vehicle operator 4010, e.g., previous driving history, along with other data as required”). Curry similarly suggests determination of a **risk profile** through processing of driving data to a driver safety statistic that is used to assess “cost of the insurance premium for the user.” USAA-1006, 10:2-12;

see id., 3:24-4:10; USAA-1003, ¶251.

[24.9]

The CCTK phone is configured to store sensor data to local memory based on the teachings of Curry and Thompson relating to local data storage. As discussed for [1.7], the CCTK phone is configured to process raw accelerometer data (*raw sensor data*) in detecting an accident occurring within a monitoring period. USAA-1007, 8-10. Based on Thompson, the CCTK phone also locally stores the raw accelerometer data. *Id.*, 9 (“WreckWatch recorded acceleration on three axes at the highest possible rate and wrote these values to a CSV file on the SD card in the device”). Further, Thompson describes using accelerometer data for post-accident reconstruction, further confirming local storage on a smartphone. *Id.*, 7. Curry similarly describes local storage of raw sensor data on a mobile device (e.g., in motion data cache 118). *See* USAA-1006, 7:5-22, 8:29-10:12, 13:20-16:6, Figs. 1, 3; USAA-1021, 233-250; USAA-1003, ¶252.

[24.11]

See [8], [9], [12]; USAA-1003, ¶253.

i) Claims 14-20, 23, 27, 28

Callopy-Curry-Thompson-Katayama renders these claims obvious in the same manner as explained above for corresponding claim limitations listed in the table below. USAA-1003, ¶254.

Claim	Corresponding Claim
[14]	[1.7]
[15.1], [15.2]	[2.1], [2.2]
[16]	[3]
[17], [28]	[7]
[18]	[8]
[19]	[9]
[20]	[10]
[23]	[4]
[27.1], [27.2]	[6.1], [6.2]

j) Claim 21

[21]

Callopy-Curry-Thompson-Katayama renders [21] obvious. As discussed for [1.3], the CCTK phone is configured according to the teachings of Callopy, Curry, and Thompson. In Curry, mobile phone 106 may be implemented using commercially-available smartphones, including the iPhone 3G. USAA-1006, 2:1-27. Around the Critical Date, the iPhone 3G was known to include a built-in camera (***image sensor***), which would have made it obvious for the CCTK phone to similarly incorporate a built-in camera. USAA-1003, ¶255; USAA-1024, 2-3; USAA-1025, 87, 88, 108.

k) Claim 22

[22]

Callopy-Curry-Thompson-Katayama discloses [22] based on the types of monitored information described within their disclosures. Callopy describes collection and monitoring GPS-based velocity data for insurance purposes (*velocity, direction of travel*). USAA-1005, [0323]. Curry likewise describes using GPS to determine vehicle speed. USAA-1006, 7:5-22. Further, in Curry, mobile phone 106 can detect speeding events by comparing GPS-based velocity against known speed limits (*indication of exceeding a velocity limit*). *Id.* Accelerometer data is also evaluated (i.e., processed) to detect unsafe driving behaviors, including erratic movements like harsh acceleration or swerving (*data representing jerky steering*). *Id.* Thompson similarly describes use of GPS data to monitor *velocity* and *direction of travel*. USAA-1007, 1, 2, 5, 8; USAA-1003, ¶256.

l) Claim 25

Callopy-Curry-Thompson-Katayama renders independent claim 25 obvious in the same manner as explained above for corresponding claim 1 limitations listed in the table below. USAA-1003, ¶257.

Claim Limitation	Corresponding Claim 1 Limitation
[25.1], [25.2], [25.3], [24.4]	[1.3]
[25.5]	[1.4]
[25.9]	[1.7]
[25.11]	[1.9]

[25.6]

The CCTK phone is configured to process sensor data (e.g., motion and orientation data) recorded by its embedded sensors (e.g., accelerometer 116) (*raw sensor data from the sensor set*). See [1.3], [1.5]; USAA-1003, ¶258; USAA-1006, 7:5-29, 8:21-27, 8:30-9:33, 10:15-26, 11:3-14. The CCTK phone is also been configured to determine a start of a recording period (*determine...a start of a driving period*) based on the sensor data (e.g., a speed from accelerometer measurements satisfying a threshold). See [1.5], [1.6]; USAA-USAA-1006, 7:5-22, 8:5-11, 8:30-9:33, 15:7-22; Figs. 1, 3; USAA-1007, 8. Further, the CCTK phone maintains this monitoring context “until the device is unplugged...” USAA-1007, 8. Thus, when the recording period is started, the CCTK phone is *within the vehicle and the vehicle is in use*. USAA-1003, ¶259; *see id.*, ¶260-62.

[25.7]

See [6.1]. A POSITA would have found it obvious that the CCTK phone is configured to collect data during a recording period (***driving period***) in a manner such that the recording period is ***defined by a duration from a start to an end of a vehicle journey***. *See* USAA-1003, ¶¶263-64. Specifically, the recording period may be initiated by the CCTK phone based on sensor data satisfying a threshold (***start***) and terminated according to the data collection techniques described in Katayama (***end***). USAA-1006, 7:5-22, 8:5-11, 8:30-9:33, 13:20-14:26, 15:7-22; USAA-1007, 8; USAA-1009, [0045], [0051]; *see* USAA-1003, ¶¶265-67 (citing USAA-1010, 11:21-40, USAA-1049, 198-99).

[25.8]

See [1.5]. The CCTK phone is configured to monitor ***acceleration*** and ***position*** of a vehicle in deriving driving behavior information (as taught in Curry) and accident-related information (as taught in Thompson). *See* USAA-1006, 7:5-29, 8:21-27, 8:30-9:33, 10:15-26, 11:3-14; USAA-1007, 2, 8-10; USAA-1003, ¶268. In Curry, a mobile phone “records the position, speed, and acceleration data for a certain time period.” USAA-1006, 11:3-14. Similarly, Thompson describes well-known mobile device configurations that “possess a compass, accelerometer, and GPS receiver allowing application developers to determine the geographic position, heading, and movement of the user.” USAA-1008, 2; *see id.*, 8 (describing combining “directionality and movement” of a vehicle using “speed

and location information from the GPS receiver...”).

[25.10]

See [6.1]; USAA-1003, ¶269.

[25.12]

See [4]; USAA-1003, ¶270.

m) Claim 26

[26]

Callopy-Curry-Thompson-Katayama renders [26] obvious. The CCTK phone is configured to monitor sensor data consistent with the teachings of Curry and Thompson. USAA-1003, ¶271; USAA-1007, 8. In Curry, a wireless phone includes an “activity recognition module” configured to “identify when a user is substantially stationary.” USAA-1006, 4:12-15. The activity recognition module uses logic to distinguish between activity modes (e.g., “walking, running, or driving”). *Id.* Further, in some implementations, Curry describes that “sensors can continue to collect [sensor] data for an extended time period, e.g., 6 minutes, to determine the type of the current activity.” *Id.*, 16:7-22. Further, “if the user changes the activity mode,” e.g., “from driving to fully stop,” the device “uses acceleration data from the accelerometer to determine the change in activity mode.” *Id.*

Based on the teachings of Curry discussed above, a POSITA would have found it obvious to similarly implement the CCTK phone to detect a change in

activity mode from driving to fully stop (*detect the end of the driving period*), where such a determination is made in response to acceleration data indicating a lack of motion (*in response to an ending input generated automatically in response to the raw sensor data having a predetermined end value*). USAA-1003, ¶272. A POSITA would have perceived this configuration detail to represent an implementation detail since Thompson similarly teaches configurations in which a smartphone ends a monitoring period. USAA-1007, 8 (“After WreckWatch determines that users are in vehicles, it maintains that as their context until the device is unplugged...”). Further, smartphone configurations for using sensor data in relation to starting and terminating driving-related monitoring periods were well-known by the Critical Date. *See, e.g.*, USAA-1010, 11:21-40 (describing a personal media device (PMD) that uses sensor data to “conclude that it is still in the vehicle but that the vehicle has stopped moving”); USAA-1003, ¶272.

Further, a POSITA would have been motivated to implement the CCTK device as discussed above because terminating a driving period based on collected sensor data was known to produce benefits to smartphone-based vehicle monitoring systems by the Critical Date. USAA-1003, ¶273; *see id.*, ¶274 (citing USAA-1049, 198-99). Katayama identifies storage constraints for on-board recording devices, which would have prompted a POSITA to seek configurations

that reduce the amount of data collected in relation to monitoring driving activity.

Id. (citing USAA-1009, [0004], [0045]). Callopy also teaches storing collected data on a mobile device in a manner that it “occupies less memory,” further suggesting a benefit of a recording paradigm that prevents the collection of unnecessary sensor data. *Id.* (citing USAA-1005, [0330]).

IV. DISCRETIONARY DENIAL⁷

A. §325(d)

The Petition does not involve the same or substantially the same art or arguments previously presented during original prosecution. *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6, 8-9 (PTAB February 13, 2020) (precedential). Warren was never before the Office, and thus, not considered by the Examiner. Callopy also was not before the Office, though the Examiner applied a single §102 rejection based on a reference (US 2010/0131204) with a similar (but not identical) disclosure. *See* USAA-1002, 231-62. Further, while Curry, Thompson, and Katayama are cited on the face of the

⁷ Petitioner is aware of a memorandum issued by Acting Director Coke Morgan Stewart on March 26, 2025 regarding Interim Processes for PTAB Workload Management, but provides a brief explanation of why discretionary denial under §325(d) is not warranted.

'728 patent, these references were not applied by the examiner in a rejection of the claims. Each of these references are relied upon for disclosure of subject matter that is materially different than that cited during prosecution.

Advanced Bionics Part 1—Though original prosecution included consideration of a reference related to Callopy, the specific combinations advanced in this Petition (Callopy-Curry-Thompson, Callopy-Curry-Thompson-Warren, Callopy-Curry-Thompson-Katayama) were not. Beyond a single reference related to Callopy, no other prior art reference (including those advanced in this Petition) was substantively applied by the Examiner in original prosecution. Thus, the same or substantially the same arguments were not previously presented to the Office, and the combinations advanced in this Petition are not cumulative of previously evaluated prior art. Factors (a), (b), and (d) counsel in favor of institution.

Advanced Bionics Part 2—The Board need not reach Part 2 of the *Advanced Bionics* framework because Part 1 is not satisfied. And yet, if assessing Part 2, original examination involved multiple material errors in failing consider relevant disclosures of Callopy, Curry, Thompson, Warren, and Katayama.

The Examiner issued a single Office Action on 10/31/2024—more than a month after the Board had already issued a FWD in IPR2023-00518 finding all challenged claims of a related patent reciting similar features unpatentable. *See* USAA-1002, 231-62. In finding all challenged claims of the related patent

unpatentable, the FWD substantively addressed grounds of rejections based on Curry, Warren, and Katayama. *See* Pap. 30, 6-7. Despite various overlapping claim features, the only prior art rejection advanced in the Office Action did not include any of these references. *See* USAA-1002, 235-62. There is also no evidence that the Examiner considered either the prior art disclosures or the Board’s analysis in the FWD in assessing patentability.

Examination of the ’728 patent was also limited—the Examiner issued a single prior art rejection based on one reference. USAA-1002, 231-62. This limited examination establishes that several of the references cited on the face of the ’728 patent were “not substantively evaluated during examination (apart from being initialed in an IDS) or a basis for rejection.” IPR2022-00158, Pap. 7, 24-26 (PTAB Apr. 4, 2022) (declining to exercise discretion under § 325(d) based on “credit[ing] Petitioner’s argument that although the references ‘were cited in an IDS, together with 111 references, none of them was used in any rejections, or otherwise addressed by the examiner’”).

Prior Board decisions further establish that Part 2 of the *Advanced Bionics* framework is not satisfied when the prosecution history provides little insight into the examiner’s evaluation of prior art asserted by a petitioner and the petitioner demonstrates with a reasonable likelihood that the asserted prior art discloses the allegedly patentable features. In *Samsung Electronics Co. Ltd. v. Evolved Wireless*

LLC, the examiner’s evaluation was not “well developed” or was “silent,” so the petitioner’s showing was “sufficient to establish that the Examiner erred because Petitioner has shown that the Examiner overlooked the particular combination of the [prior art references], which were among the hundreds of references listed on the IDS.” IPR2021-00943, Pap. 9, 12 (PTAB Dec. 1, 2021).

As highlighted in Grounds 1-3, the Office clearly did not appreciate Callopy’s disclosures and how those references in combination with other prior art references (Curry, Thompson, Warren, Katayama) render the Challenged Claims obvious. Moreover, USAA has shown a reasonable likelihood that it would prevail that at least one of the Challenged Claims is unpatentable over the applied art based on the current record. *See* §III.A-C; PGR2022-00010, Pap. 9, 8-9 (PTAB June 6, 2022). As such, USAA has demonstrated material error by the Office, and discretionary denial is not warranted.

V. CONCLUSION AND FEES

The Challenged Claims are unpatentable. Petitioner 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 '728 patent is not the subject of a civil action. USAA is not aware of any disclaimers, reexamination certificates, or IPR petitions addressing the '728 patent.

USAA has also previously filed eleven IPR petitions challenging patents related to the '728 patent, including petitions challenging U.S. Pat. No. 9,633,487 (IPR2023-00518, IPR2023-00519), U.S. Pat. No. 10,192,369 (IPR2023-00768, IPR2023-00769, IPR2023-00770), U.S. Pat. No. 10,198,879 (IPR2023-00857, IPR2023-00858, IPR2023-00859), U.S. Pat. No. 9,311,271 (IPR2023-00911, IPR2023-00912), and U.S. Pat. No. 10,198,878 (IPR2024-00779).

The Board instituted 4 of the 11 IPR proceedings and ultimately found unpatentable all challenged claims of each of the challenged related patents subject to those IPR proceedings. *See* IPR2023-00518, Pap. 30 (PTAB Sep. 17, 2024); IPR2023-00768, Pap. 28 (PTAB Nov. 5, 2024); IPR2023-00857, Pap. 29 (PTAB Nov. 25, 2024); IPR2023-00911, Pap. 28 (PTAB Nov. 25, 2024).

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

Petitioner provides the following designation of counsel.

Lead Counsel	Backup Counsel
W. Karl Renner, Reg. No. 41,265 Fish & Richardson P.C. 60 South Sixth Street, Suite 3200 Minneapolis, MN 55402 Tel: 202-783-5070 Fax: 877-769-7945 Email: IPR36137-0034IP1@fr.com	Thomas Rozylowicz, Reg. No. 50,620 Andrew B. Patrick, Reg. No. 63,471 Michael T. Zoppo, Reg. No. 61,074 Ryan Chowdhury, Reg. No. 74,466 60 South Sixth Street, Suite 3200 Minneapolis, MN 55402 Tel: 202-783-5070 Fax: 877-769-7945 PTABInbound@fr.com

D. Service Information

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

Petitioner consents to electronic service by email at IPR36137-0034IP1@fr.com

(referencing No. 36137-0034IP1 and cc'ing PTABInbound@fr.com, [\[ptab@fr.com\]\(mailto:ptab@fr.com\), \[tar@fr.com\]\(mailto:tar@fr.com\), \[patrick@fr.com\]\(mailto:patrick@fr.com\), \[zoppo@fr.com\]\(mailto:zoppo@fr.com\), and](mailto:axf-</p></div><div data-bbox=)

rchowdhury@fr.com).

Respectfully submitted,

Dated March 31, 2025

/Thomas A. Rozylowicz/

W. Karl Renner, Reg. No. 41,265
Thomas Rozylowicz, Reg. No. 50,620
Andrew B. Patrick, Reg. No. 63,471
Michael T. Zoppo, Reg. No. 61,074
Ryan Chowdhury, Reg. No. 74,466
Fish & Richardson P.C.
60 South Sixth Street, Suite 3200
Minneapolis, MN 55402
T: 202-783-5070
F: 877-769-7945

(Control No. IPR2025-00812)

Attorneys for Petitioner

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 13,438 words, which is less than the 14,000 allowed under 37 CFR § 42.24.

Dated March 31, 2025

/Thomas A. Rozylowicz/
W. Karl Renner, Reg. No. 41,265
Thomas A. Rozylowicz, No. 50,620
Andrew B. Patrick, Reg. No. 63,471
Michael T. Zoppo, Reg. No. 61,074
Ryan Chowdhury, Reg. No. 74,466
Fish & Richardson P.C.
60 South Sixth Street, Suite 3200
Minneapolis, MN 55402
T: 202-783-5070
F: 877-769-7945

Attorneys for Petitioner

CERTIFICATE OF SERVICE

Pursuant to 37 CFR §§ 42.6(e)(4)(i) *et seq.* and 42.105(b), the undersigned certifies that on March 31, 2025, a complete and entire copy of this Petition for *Inter Partes* Review, Power of Attorney, and all supporting exhibits were provided by Federal Express, to the Patent Owner, by serving the correspondence address of record as follows:

Baker & Hostetler LLP
Washington Square, Suite 1100
1050 Connecticut Ave. N.W.
Washington, DC 20036-5304

/Anastasia Renard/
Anastasia Renard
Fish & Richardson P.C.
60 South Sixth Street, Suite 3200
Minneapolis, MN 55402
renard@fr.com