

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Andrew William Wright
U.S. Patent No.: 9,311,271 Attorney Docket No.: 36137-0024IP2
Issue Date: April 12, 2016
Appl. Serial No.: 13/994,455
Filing Date: July 24, 2013
Title: METHOD AND SYSTEM FOR LOGGING VEHICLE BEHAV-
IOUR

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PETITION FOR *INTER PARTES* REVIEW OF
UNITED STATES PATENT NO. 9,311,271

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EXHIBITS

USAA-1001	U.S. Patent No. 9,311,271 to Wright (“the ‘271 Patent”)
USAA-1002	Excerpts from the Prosecution History of the ‘271 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	U.S. Pat. Appl. Pub. No. 2011/0307188 (“Peng”)
USAA-1006	U.S. Pat. Appl. Pub. No. 2010/0131691 (“Chatterjee”)
USAA-1007	U.S. Patent No. 6,073,004 to Balachandran (“Balachandran”)
USAA-1008	Thompson et. al, “Using Smartphones to Detect Car Accidents and Provide Situational Awareness to Emergency Responders,” Mobilware 2010, LNICST 48, pp. 29–42, 2010 (“Thompson2010”)
USAA-1009	International Publication No. WO 2007/114716 (“Willis”)
USAA-1010	U.S. Patent Application Publication No. 2008/0255888 (“Berkobin”)
USAA-1011	Cheng et. al, “An Android System Design and Implementation for Telematics Services,” 2010 IEEE International Conference on Intelligent Computing and Intelligent Systems. Vol. 2. IEEE, 2010 (“Cheng2010”)
USAA-1012	U.S. Patent No. 7,821,421 to Tamir et. al (“Tamir”)
USAA-1013	U.S. Pat. No. 8,682,399 to Rabu (“Rabu”)

USAA-1014	U.S. Pat. App. Pub. No. 2010/0208070 to Haynes (“Haynes”)
USAA-1015	U.S. Pat. App. Pub. No. 2002/0105423 to Rast (“Rast”)
USAA-1016	U.S. Pat. App. Pub. No. 2009/0192705 to Golding (“Golding”)
USAA-1017	U.S. Pat. No. 7,765,058 to Doering (“Doering”)
USAA-1018	European Pat. Pub. No. EP1614585A1 to Christian (“Christian”)
USAA-1019	U.S. Pat. No. 5,906,393 to Mazur (“Mazur”)
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USAA-1021	Kanianthra, Joseph, Arthur Carter, and Gerard Preziotti. “Enhancing post-crash vehicle safety through an automatic collision notification system,” No. 2001-06-0085. SAE Technical Paper, 2001 (“Kanianthra2001”)
USAA-1022	Megalingam R.K. et al., “Wireless vehicular accident detection and reporting system.” 2010 International Conference on Mechanical and Electrical Technology (ICMET 2010) (“Megalingam2010”)
USAA-1023	Farris, P. et al., “General Motors OnStar.” Darden Case No. UVA-M-0659 (2002) (“Farris2002”)
USAA-1024	European Pat. App. Pub. No. EP 1,914,691 to Katayama et al. (“Katayama”)
USAA-1025	U.S. Pat. App. Pub. No. 2012/0074770 to Lee (“Lee”)
USAA-1026	International Publication No. WO 2010/042545 to Curry et. al (“Curry”)

USAA-1027	Linda Null and Julia Lobur, Excerpts from The Essentials of Computer Organization and Architecture (2003) (“Null”)
USAA-1028	U.S. Pat. Publication No. 2009/0005975 to Forstall et al. (“Forstall”)
USAA-1029	Langle, Lonnie, and Ram Dantu, “Are you a safe driver” 2009 International Conference on Computational Science and Engineering. Vol. 2. IEEE, 2009 (“Langle”)
USAA-1030	U.S. Pat. Publication No. 2006/0053038 to Warren et al. (“Warren”)
USAA-1031	U.S. Pat. Publication No. 2007/0027585 to Wulff (“Wulff”)
USAA-1032	Mohan, Prashanth et al., “Nericell: Rich Monitoring of Road and Traffic Conditions using Mobile Smartphones,” Proceedings of the 6th ACM conference on Embedded network sensor systems, 2008. 323-336 (“Mohan”)
USAA-1033	U.S. Pat. No. 5,274,560 to LaRue (“LaRue”)
USAA-1034	Declaration of Nathaniel E. Frank-White re Exhibits USAA-1077 (Ex. A) and USAA-1078 (Ex. B)
USAA-1035	RESERVED
USAA-1036	Declaration of Nathaniel E. Frank-White re Exhibits USAA-1079 (Ex. A), USAA-1080 (Ex. B), and USAA-1081 (Ex. C)
USAA-1037-1040	RESERVED
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- USAA-1045 International Publication No. WO 2010/062899 ("Callopy")
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- USAA-1049 Work, D. B. & Bayen, A.M., "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")
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- USAA-1053 Zhao, Yilin, “Standardization of mobile phone positioning for 3G systems,” IEEE Communications magazine 40.7 (2002): 108-116 (“Zhao2002B”)
- USAA-1054 Strömmer, Esko et al., “Ultra-low Power Sensors with Near Field Communication for Mobile Applications,” Wireless Sensor and Actor Networks WSAN 2007: IFIP International Federation for Information Processing. Springer, Boston, MA, 2007 (“Strömmer2007”)
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- USAA-1056 Liutkauskas, V. et al., “Location based services,” Elektronika ir elektrotechnika 52.3 (2004). 35-40. (“Liutkauskas2004”)
- USAA-1057 Ealey, Lance & Luis Troyano-Bermúdez, “Are automobiles the next commodity?” The McKinsey Quarterly 4 (1996): 62-75 (“Ealey1996”)
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- USAA-1066 Order Granting Motion for Entry of Scheduling Order in *Auto Telematics Ltd. v. United Services Automobile Association*, 6:22-cv-00474 (W.D. Tex. September 16, 2022)
- USAA-1067 U.S. District Court Statistics (June 30, 2022), *available at* https://www.uscourts.gov/sites/default/files/fcms_na_distprofile_0630.2022_0.pdf
- USAA-1068 USAA’s Opening Claim Construction Brief in *Auto Telematics Ltd. v. United Services Automobile Association*, 6:22-cv-00474 (W.D. Tex. December 19, 2022)
- USAA-1069 Plaintiff’s Claim Construction Response Brief in *Auto Telematics Ltd. v. United Services Automobile Association*, 6:22-cv-00474 (W.D. Tex. January 12, 2023)

USAA-1070	USAA’s Reply Claim Construction Brief in <i>Auto Telematics Ltd. v. United Services Automobile Association</i> , 6:22-cv-00474 (W.D. Tex. January 25, 2023)
USAA-1071	Plaintiff’s Claim Construction Sur-Reply Brief in <i>Auto Telematics Ltd. v. United Services Automobile Association</i> , 6:22-cv-00474 (W.D. Tex. February 6, 2023)
USAA-1072	Joint Claim Construction Statement in <i>Auto Telematics Ltd. v. United Services Automobile Association</i> , 6:22-cv-00474 (W.D. Tex. February 7, 2023)
USAA-1073	Claim Construction Order in <i>Auto Telematics Ltd. v. United Services Automobile Association</i> , 6:22-cv-00474 (W.D. Tex. February 16, 2023)
USAA-1074	Stipulation by USAA
USAA-1075	Plaintiff Auto Telematics Ltd.’s Preliminary Infringement Contentions and Identification of Document Production Accompanying Disclosure in <i>Auto Telematics Ltd. v. United Services Automobile Association</i> , 6:22-cv-00474 (W.D. Tex. August 26, 2022)
USAA-1076	United Services Automobile Association’s Preliminary Invalidity Contentions in <i>Auto Telematics Ltd. v. United Services Automobile Association</i> , 6:22-cv-00474 (W.D. Tex. October 21, 2022)
USAA-1077	Internet Archive of Waze User Manual
USAA-1078	Internet Archive of iPhone User Guide
USAA-1079	Internet Archive of iPhone 3G Technical Specification

USAA-1080	Internet Archive of iPhone User Guide for iPhone and iPhone 3G
USAA-1081	Internet Archive of Instruction Sheet for iPhone 3G
USAA-1082-1499 RESERVED	
USAA-1500	International Publication No. WO 2012/036809 (“Bourque”)
USAA-1501	U.S. Pat. Appl. Pub. No. 2012/0071151 (“Abramson et al.”)
USAA-1502	U.S. Pat. Appl. Pub. No. 2006/0145039 (“Shawver”)
USAA-1503	Priority Document GB 1021292.6 filed Dec. 15, 2010 (“P1”)
USAA-1504	Priority Document GB 1101259.8 filed Jan. 25, 2011 (“P2”)
USAA-1505	Priority Document GB 1109759.9 filed Jun. 10, 2011 (“P3”)
USAA-1506	Priority Document GB 1118777.0 filed Oct. 31, 2011 (“P4”)
USAA-1507	Balasubramanian, et al. "Energy consumption in mobile phones: a measurement study and implications for network applications." Proceedings of the 9th ACM SIGCOMM Conference on Internet Measurement. 2009. (“Balasubramanian”)
USAA-1508	Carroll, et al. “An analysis of power consumption in a smartphone.” USENIX annual technical conference. Vol. 14. 2010 (“Carroll”)
USAA-1509	Miyaji, et al. “Analysis of driver behavior based on traffic incidents for driver monitor systems.” 2008 IEEE Intelligent Vehicles Symposium. IEEE (“Miyaji”)
USAA-1510	U.S. Patent No. 7,505,784 to Barbera (“Barbera”)

USAA-1511	Mitrovic, “Reliable method for driving events recognition.” IEEE transactions on intelligent transportation systems 6.2 (2005): 198-205 (“Mitrovic”)
USAA-1512	Boonmee, et al., “Portable reckless driving detection system.” 2009 6th International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology. Vol. 1. IEEE, 2009 (“Boonmee”)
USAA-1513	Singleton, et al., “Automobile event data recorder forensics,” Advances in Digital Forensics IV 4. Springer US, 2008 (“Singleton”)
USAA-1514	Correia, et al, “Utilizing data from automotive event data recorders,” Proceedings of the Canadian Multidisciplinary Road Safety Conference XII, London Ontario, 2001 (“Correia”)
USAA-1515	Flowers, et al, “Prediction of Accident Likelihood Using Poisson Regression,” Traffic Accident Research and Evaluation Program, Texas Transportation Institute, The Texas A&M University System, 1980 (“Flowers”)
USAA-1516	U.S. Pat. Appl. Pub. No. 2014/0114696 (“Amigo”)
USAA-1517	U.S. Pub. No. 2010/0131307 (“Collopy”)
USAA-1518	U.S. Pub. No. 2011/0077028 (“Wilkes”)

LISTING OF CHALLENGED CLAIMS

Claim	Identifier	Claim Language
1	[1.1]	A mobile telecommunications device configured to log driving information associated with a vehicle,
	[1.2]	the mobile device comprising: a sensor set comprising an image sensor, an audio sensor, an accelerometer, or a positioning module, or a combination thereof;
	[1.3]	a user interface;
	[1.4]	a processor; and
	[1.5]	a memory;
	[1.6]	the mobile device configured to: determine, based on inputs received by the user interface and sensor data from the sensor set, a start of a driving period during which the mobile device is removably attached to the vehicle and the vehicle is in use;
	[1.7]	process the sensor data from the sensor set during the driving period to derive driving information associated with how the vehicle is driven;
	[1.8]	store a selection of the driving information to the memory,
	[1.9]	wherein the driving information is derived without data from vehicle sensors; and,
	[1.10]	wherein the mobile communications device is controlled by a downloaded application to control the mobile device to register the start of the driving period in response to an initialization input generated automatically in response to the sensor data having predetermined values, wherein the initialization input is generated in response to sensor data reflecting a detected speed above a predetermined threshold.
2	[2]	A mobile telecommunications device according to claim 1, wherein the mobile communications device is further configured to register the attachment of the mobile

Claim	Identifier	Claim Language
		device to the vehicle and determine a match between a location of the mobile device and a location of the vehicle.
3	[3]	A mobile telecommunications device according to claim 1, wherein the mobile communications device is controlled by a downloaded application to control the mobile device to down-sample sensor data from a first sampling rate to a second sampling and store the sensor data at said second sampling rate.
4	[4.1]	A mobile telecommunications device configured to log driving information associated with a vehicle,
	[4.2]	the mobile device comprising: a sensor set comprising an image sensor, an audio sensor, an accelerometer, or a positioning module, or a combination thereof;
	[4.3]	a user interface;
	[4.4]	a processor; and
	[4.5]	a memory;
	[4.6]	the mobile device configured to: determine, based on inputs received by the user interface and sensor data from the sensor set, a start of a driving period during which the mobile device is removably attached to the vehicle and the vehicle is in use;
	[4.7]	process the sensor data from the sensor set during the driving period to derive driving information associated with how the vehicle is driven,
	[4.8]	store a selection of the driving information to the memory,
	[4.9]	wherein the driving information is derived without data from vehicle sensors; and,
	[4.10]	wherein the mobile communications device is controlled by a downloaded application to control the mobile device to process the sensor data from the sensor set during a plurality of driving periods to derive driving information associated with how the vehicle is driven

Claim	Identifier	Claim Language
		during the driving periods,
	[4.11]	the sensor data being processed during a first set of driving periods defining a benchmark against which sensor data is compared during subsequent sets of driving periods.
5	[5.1]	A mobile telecommunications device according to claim 4, wherein the mobile communications device is further configured to: detect occurrence of a predetermined event by correlating the sensor data against at least one event indication model, the at least one event indication model comprising a set of predetermined data values that are compared against corresponding sensor data; and
	[5.2]	modify the at least one event indication model in response to the benchmark.
6	[6.1]	A data-logging system for logging driving information received from a remote mobile telecommunications device, the data-logging system comprising
	[6.2]	a processor and
	[6.3]	memory,
	[6.4]	the data logging system comprising: a database for storing a plurality of accounts, each account having a unique identifier and the database being arranged to store driving information associated with at least one of a vehicle and a driver;
	[6.5]	a communications interface arranged to communicate with the remote mobile telecommunications device, and receive therefrom:
	[6.6]	a unique identifier for association of the remote mobile telecommunications device with a corresponding one of the plurality of accounts;
	[6.7]	driving information to be logged to that corresponding account, the driving information derived based on inputs received by a user interface of the remote mobile

Claim	Identifier	Claim Language
		telecommunications device and sensor data from a sensor set of the remote mobile telecommunications device,
	[6.8]	the driving information derived without data from vehicle sensors; and,
	[6.9]	wherein the driving information comprises at least one of a driving score and sensor data captured and processed by the remote mobile telecommunications device during a driving period during which the remote mobile telecommunications device is removably attached to the vehicle being driven by the driver,
	[6.10]	the data logging system being further arranged to process the driving information logged to a corresponding account to generate a driving score used to determine a risk profile for at least one of the vehicle and driver.
7	[7.1]	A data-logging system for logging driving information received from a remote mobile telecommunications device, the data-logging system comprising
	[7.2]	a processor and
	[7.3]	memory,
	[7.4]	the data logging system comprising: a database for storing a plurality of accounts, each account having a unique identifier and the database being arranged to store driving information associated with at least one of a vehicle and a driver;
	[7.5]	a communications interface arranged to communicate with the remote mobile telecommunications device, and receive therefrom:
	[7.6]	a unique identifier for association of the remote mobile telecommunications device with a corresponding one of the plurality of accounts;
	[7.7]	driving information to be logged to that corresponding account, the driving information derived based on inputs

Claim	Identifier	Claim Language
		received by a user interface of the remote mobile telecommunications device and sensor data from a sensor set of the remote mobile telecommunications device,
	[7.8]	the driving information derived without data from vehicle sensors; and,
	[7.9]	wherein the driving information comprises at least one of a driving score and sensor data captured and processed by the remote mobile telecommunications device during a driving period during which the remote mobile telecommunications device is removably attached to the vehicle being driven by the driver,
	[7.10]	the data logging system being further arranged to process the driving information logged to a corresponding account to generate a driving score used to determine a risk profile for at least one of the vehicle and driver; and
	[7.11]	wherein the driving score is used to define an insurance premium associated with the account and the data logging system is further arranged to communicate to the remote mobile telecommunication device an insurance offer generated in response to the driving information received from the remote mobile telecommunications device.

United Services Automobile Association (“Petitioner” or “USAA”) petitions for *Inter Partes* Review (“IPR”) of claims 1-7 (“the Challenged Claims”) of U.S. Patent No. 9,311,271 (“the ’271 Patent”).

I. REQUIREMENTS

A. Grounds for Standing

USAA certifies that the ’271 Patent is available for IPR. USAA is not barred or estopped from requesting this review challenging the Challenged Claims on the below-identified grounds. USAA was served with a complaint of infringement of the ’271 Patent. USAA-1004.

B. Challenge and Relief Requested

Petitioner requests an IPR of the Challenged Claims on the grounds noted below, and based on related testimony from Dr. William Michalson¹. USAA-1003.

Ground	Claim(s)	35 U.S.C. § 103
1A	1, 2, 4	Peng, Chatterjee
1B	3	Peng, Chatterjee, Tamir
1C	5	Peng, Chatterjee, Wilkes

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

Ground	Claim(s)	35 U.S.C. § 103
1D	6, 7	Peng, Callopy

The '271 Patent was filed on 07/24/2013, which is the “Critical Date” for the reasons provided herein (*see* §II.C, *infra*). Although the '271 Patent claims priority to a non-provisional application and multiple foreign priority documents,² the Challenged Claims are not entitled to the earlier claimed priority dates. USAA-1003, ¶¶68-107. Accordingly, the applied references are prior art:

Reference	Date	Basis
Peng	6/29/2011	§102(e)
Chatterjee	5/27/2010	§102(b)
Tamir	2/1/2007	§102(b)
Wilkes	3/31/2011	§102(b)
Callopy	3/6/2010	§102(b)

C. Claim Construction

² In its Infringement Complaint, Auto Telematics stated “[t]he '271 Patent claims priority to PCT Application No. PCT/GB2011/052492, filed on December 15, 2011.” USAA-1004, 8-9.

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

As discussed in §III.A.2, *infra*, claims 1 and 4 recite:

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

Based on plain meaning, the recited “driving period” references a time period “during which [a] mobile device is removably attached to the vehicle and the vehicle is in use.”³ Though the namesake of the “driving period” suggests driving, because the two claim parameters defining the “driving period” are “removably attached...*and* the vehicle is in use,” the claim leaves open the possibility of the driving period corresponding to the beginning, middle, or end of a vehicle’s operation. USAA-1003, ¶¶109-110. The ’271 Patent specification is similarly unbounded, as it expressly recognizes several driving period options that are untethered from, e.g., the beginning of the user driving the vehicle: “the mobile device [] register[s] the start of a driving period in response to an initialisation input,” which may be “the user manually executing the application on the mobile device[,]” and “the mobile device being installed to the vehicle and/or the vehicle being

³ Independent claims 6 and 7 include a similar recitation. §III.D.2-3, *infra*.

driven.” USAA-1001, 3:25-54; USAA-1003, ¶¶108-110.

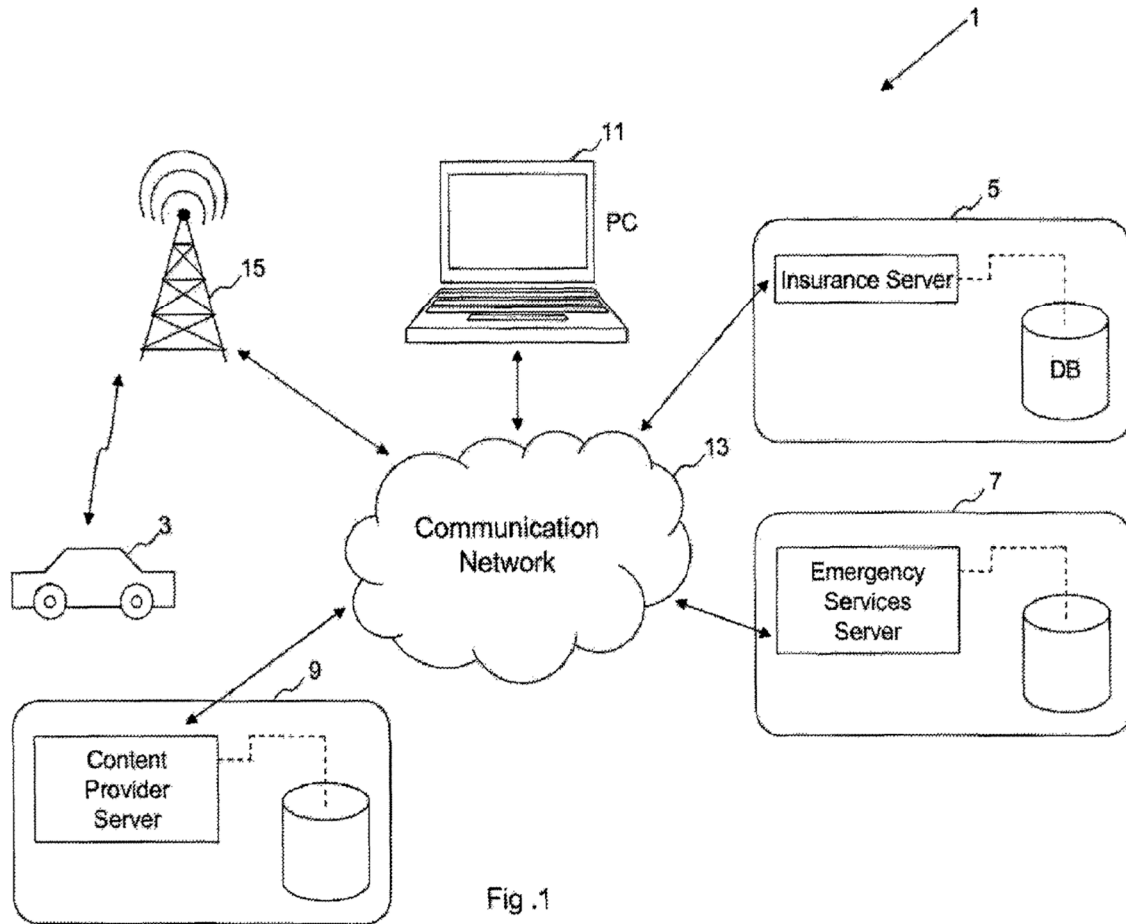
Thus, this claim term establishes just two “driving period” attributes: (1) “the mobile device is removably attached to the vehicle” and (2) “the vehicle is in use.” USAA-1003, ¶110. These attributes may be satisfied by a start of a data collection period, whether at the onset of vehicle driving or whether instead before or thereafter. *Id.*

II. THE ’271 PATENT

A. Specification

The ’271 Patent is directed to “logging driving information....” USAA-1001, Abstract. A mobile device installed in the vehicle logs information that can be used to “determine the cause of an accident,” “modify driver behavior,” or “determine insurance premiums.” *Id.*, 1:17-25; USAA-1003, ¶¶55-58. Even the ’271 patent acknowledges that “data logging devices that can be retrofitted to road conditions” are “known in the art.” *Id.*, 1:44-53.

Figure 1 shows a system 1 placed in automobile 3:



USAA-1001, FIG. 1

B. Prosecution History

During prosecution, the examiner rejected the claims over U.S. Patent No. 8,140,358 and U.S. Pub. No. 2007/0150139 . *See* USAA-1002, 54-62, 86-97. The examiner did not consider Peng, Chatterjee, Tamir, Wilkes, or Callopy⁴, which, in the combinations listed in §I.B, render the Challenged Claims obvious. USAA-1003, ¶¶60-67. This petition addresses claim features distinguished during

⁴ *See* discussion *infra* §IV.B.

prosecution in a fresh way using new combinations of prior art, none of which were previously considered.

C. The '271 Patent's Priority Claim

The '271 Patent claims priority to priority documents P1-P3,⁵ each filed before Peng and each lacking written description support for the '271 Patent claims. USAA-1003, ¶¶68-105. Specifically, each document fails to provide support for at least two elements of independent claims 1, 4, 6, and 7. *Id.*

First, P1-P3 fail to provide support for a “driving score” (elements [6.9]/[7.9], [6.10]/[7.10], [7.11]). *Id.*, ¶¶68-105 (the phrase and/or functionality of a driving score not even mentioned).

Second, P1-P3 fail to provide support for a mobile telecommunications device that “determine[s], based on inputs received by the user interface *and* sensor data from the sensor set, a start of a driving period ...”⁶ (elements [1.6]/[4.6]). *Id.*, ¶¶68-105 (the priority documents teach, or at least suggests, the start of the driving period does not involve user inputs or sensor inputs).

⁵ The '271 Patent claims the benefit of and priority to P1-P4 (USAA-1503-6). P4 was not considered in this analysis because it was filed after Peng.

⁶ Unless otherwise indicated, all emphasis has been added herein.

Third, PO structured elements [1.9]/[4.9]/[6.8]/[7.8] as a negative limitation (“without data from vehicle sensors), but none of P1-P3 nor U.S. Application No. 13/994,455 (“’455 application”), which issued as the ’271 Patent, provides support. USAA-1003, ¶¶68-105. The written description requirement is heightened for negatively-articulated limitations, requiring explicit support – mere silence is insufficient under 35 U.S.C. §112. *Novartis v. Accord Healthcare*, Docket No. 2021-1070 (June 21, 2022). The failure or omission of reference to a claimed object does not constitute disclosure of the negative limitation. *See Seabed Geosolutions (US) Inc. v. Magseis FF LLC*, 8 F.4th 1285, 1288 (Fed. Cir. 2021); MPEP § 2173.05(i) (9th ed. Rev. 10.2019, June 2020).

Despite the heightened requirement, P1-P3 provide no explicit support for the negative limitation. USAA-1003, ¶¶68-105. Moreover, contrary to the negative limitation, the ’455 application (and ’271 Patent) indicates that the mobile communication device receives data from vehicle sensors. USAA-1003, ¶¶68-105; USAA-1001, 1:61-62, 9:43-57, 10:38-39, 10:56-57, 11:4-5, 11:13-16, 11:42-43, 22:23-43.

Thus, Peng is prior art. USAA-1003, ¶¶68-105.

III. THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. [GROUND 1A] – The Combination of Peng and Chatterjee Renders Claims 1, 2, and 4 Obvious

1. Analysis

a) Peng

Peng is directed to “collecting and evaluating driving behavior data and/or driving environment data, and providing feedback based on such evaluated data” using “a handheld mobile device [(HMD)], e.g., a smart phone” for “a variety of applications.” USAA-1005, [0001], [0019], [0165]; *see also id.*, Abstract, [0002]-[0004]; USAA-1003, ¶¶111-116.

FIG. 1 illustrates an exemplary [HMD] 10 that can include “one or more sensors, a driving analysis application, and a display,” and “a touch screen” and/or “input/output devices 38,” enabling generation of sensor data and receipt of user input. USAA-1005, [0010], [0019]-[0020], [0030]-[0031], FIG. 1. The HMD 10 can provide a “collection of driving data,” “processing of collected driving data,” and/or “feedback based on the processed driving data,” such that driving information is derived without data from vehicle sensors. *Id.*; USAA-1003, ¶¶111-112.

Handheld mobile device 10

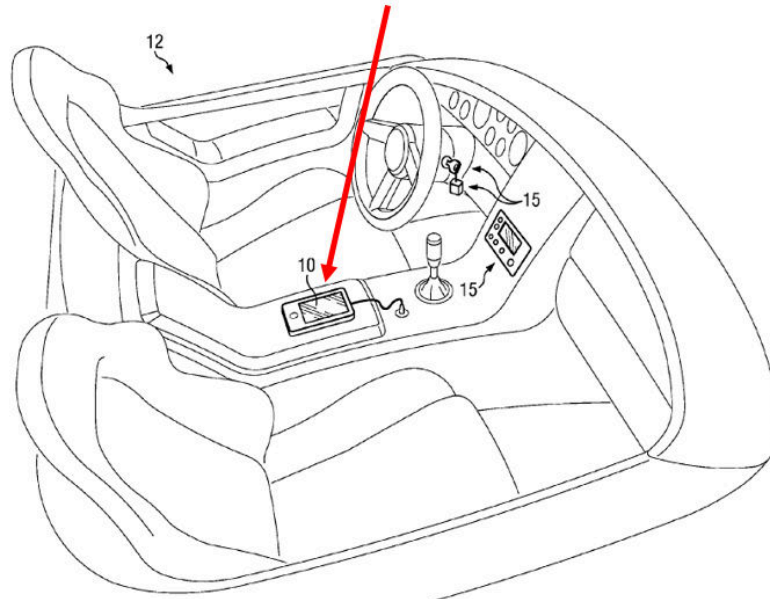
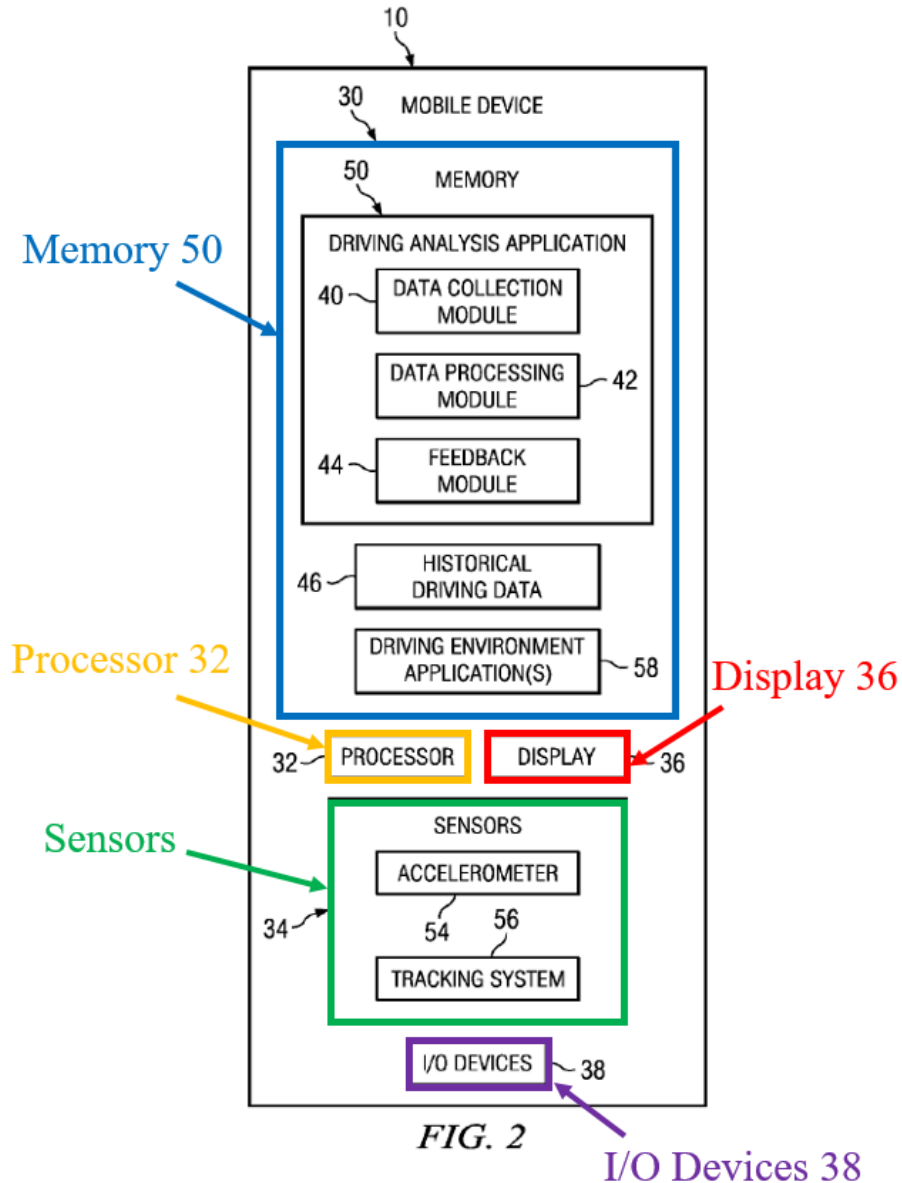


FIG. 1

USAA-1005, FIG. 1 (annotated)

As shown in FIG. 2, Peng's "[HMD] 10 may include a memory 30, processor 32, one or more sensors 34, a display 36, and input/output devices 38." USAA-1005, [0025]. Sensors 34, such as a "built-in accelerometer 54" and "a location tracking system 56," "collect...data regarding driving behavior and/or the driving environment" that is distinct of data from vehicle sensors. *Id.*, [0021], [0077], [0029], [0034]; USAA-1003, ¶113.



USAA-1005, FIG. 2 (annotated)

FIG. 4 shows steps performed by HMD 10 to provide driver feedback.

USAA-1005, [0075]-[0077], [0152]-[0153], [0057]-[0065], FIGS. 4, 6A; USAA-1003, ¶¶114-117. Among them, device 10 first ensures proper orientation (step 102) when determining whether it is ready to collect driving data (step 104). *Id.*

In doing so, based on sensor data and leveraging user input, HMD 10 “interact[s] with the user to adjust the [HMD] 10 such that the orientation...is suitable for collecting driving data.” USAA-1005, [0076], FIG. 4.

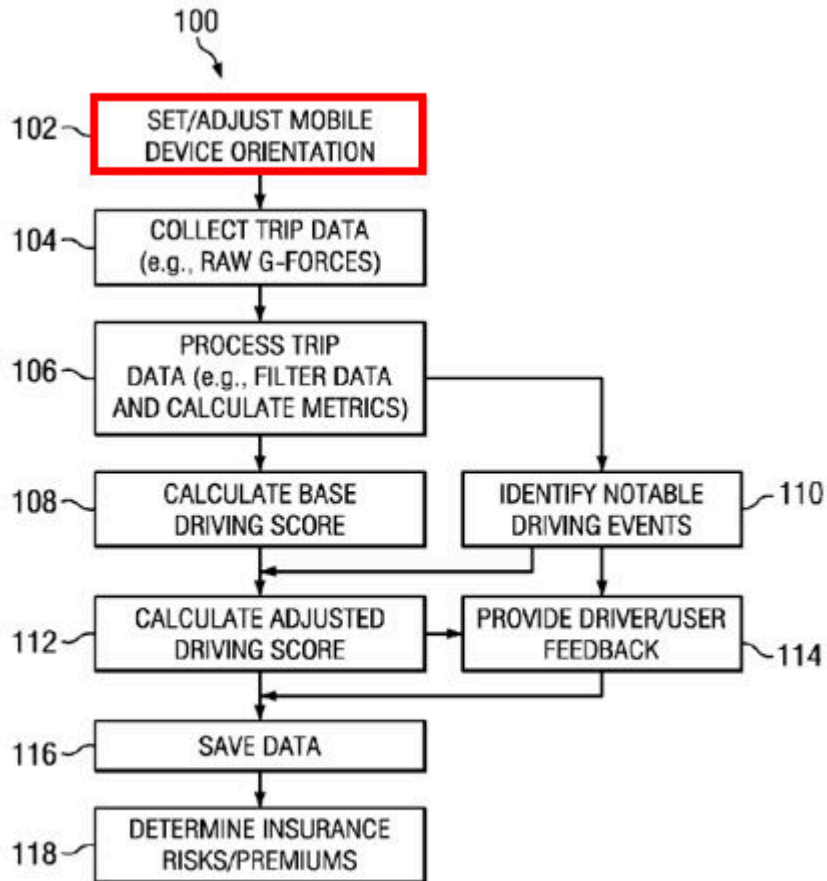


FIG. 4

USAA-1005, FIG. 4 (annotated)

As shown in FIG. 6A, a person of ordinary skill in the art at the time of the '271 Patent (“POSITA”)⁷ would have understood that a user may be prompted for

⁷ USAA-1003, ¶¶14-15 (defining a POSITA)

input through its display by “a screen 200 of a device orientation feature” to position the device, e.g., “place [the] device...in a cup holder,” to ensure proper orientation suitable for collecting driving data, which starts only upon a determination of proper orientation. USAA-1005, [0151], [0077], [0036], FIG. 6A; USAA-1003, ¶¶133-137.

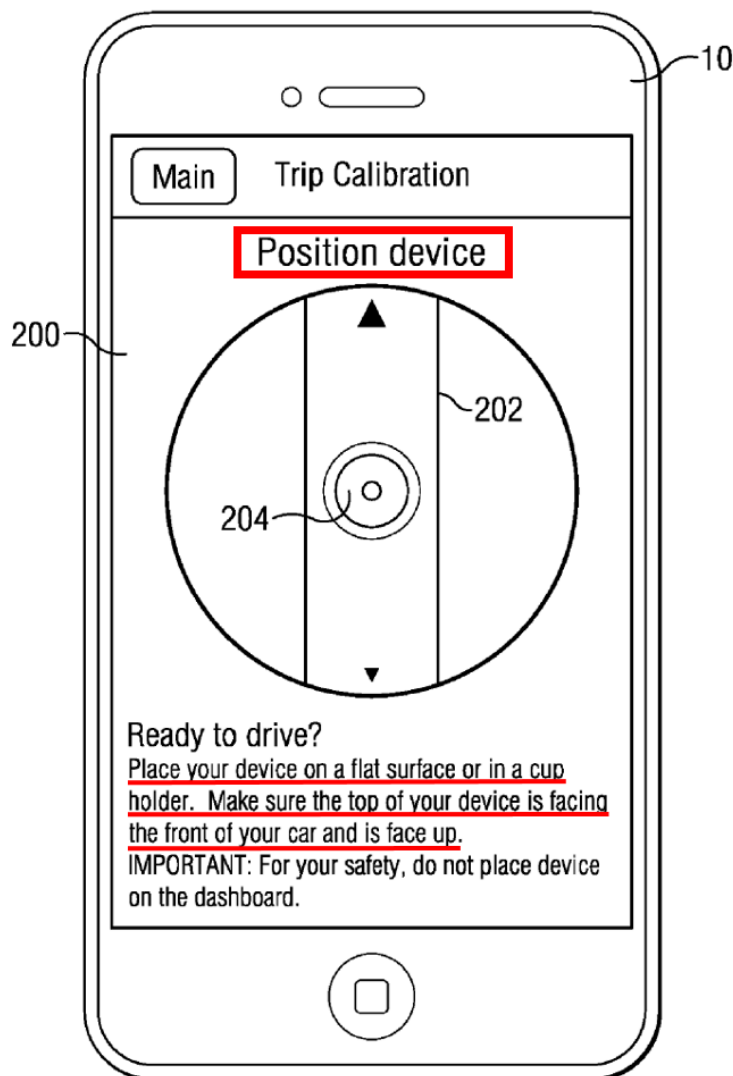


FIG. 6A

USAA-1005, FIG. 6A (annotated)

HMD 10 can also determine if it is “being properly oriented” based on the mobile device’s sensor data using, e.g., “GPS and position information.” USAA-1005, [0037], [0152], [0040], [0067], [0036], [0029], [0077], FIG. 6A. Using its sensors, the device 10 also “continue[s] to monitor the orientation of [HMD] 10 relative to the vehicle” during driving. *Id.*, [0037]. In certain circumstances, interruptions can occur if device sensors detect that the device is not properly oriented during data collection. *Id.*, [0036]-[0037], [0040]-[0041], [0152]-[0153]; USAA-1003, ¶¶113-116, 134-136.

HMD 10 “may include...a driving analysis application” to “process any or all of [the] driving data collected by [HMD] 10...to calculate one or more driving behavior metrics and/or scores based on such collected driving data,” while the vehicle is in use, e.g., “acceleration, braking, and cornering metrics,” and “identify ‘notable driving events [(NDE)].’” USAA-1005, [0020], [0022], [0026], [0068], [0044]-[0045], [0053], [0069], [0155]-[0156]. As Peng does not require input or consideration of vehicle sensor data, a POSITA would understand from Peng that these driving behavior metrics and/or scores can be derived without data from vehicle sensors. USAA-1003, ¶¶114-116. Regardless, the driving analysis application may share data with others, e.g., “an insurance company.” USAA-1005, [0024]; *see also id.*, [0004], [0074], [0143], [0165].

b) Chatterjee

Chatterjee describes a system that includes “a mobile computing device (also referred to as an MCD),” which can be a “cellular phone or mobile device,” such as a “smart phone.” USAA-1006, [0090]-[0091]. Chatterjee also describes integration of an accessory device, such as “a dock or docking station,” which can “signal...power or data to [MCD].” USAA-1006, [0064], [0057], Abstract, [0270], [0047], FIGS. 1A-1B, 16A-20, 25, 29-34C; USAA-1003, ¶¶117-119.

In FIG. 1A, Chatterjee’s MCD 110 is retained by a dock 120, which includes a housing with surface 125 to “receive and retain the [MCD 110].” USAA-1006, [0065], [0107], FIGS. 25, 5-6, 1B, 5-6, 16A-20, 25, 29-34C, Abstract, [0057]. “[D]ock 120 utilizes physical support structures...to retain the MCD 110 in a docked or mated position,” “such as “magnetic clasps,” or “mechanical retention features.” *Id.*, [0066], [0201]-[0214]; USAA-1003, ¶¶117-119.

Chatterjee explains that its MCD and/or dock can detect when the MCD is docked. *Id.*, [0151]-[0152], [0182]. The MCD can “include[] one or more detectors 560 (or sensors) for detecting orientation or position of the MCD 500 when the device is docked,” and that orientation can “configuring operations or behavior of one or both devices.” *Id.*, [0065], [0092], [0097]-[0098], [0104], [0106], [0174]-[0177], [0182]-[0200]; USAA-1003, ¶¶117-119.

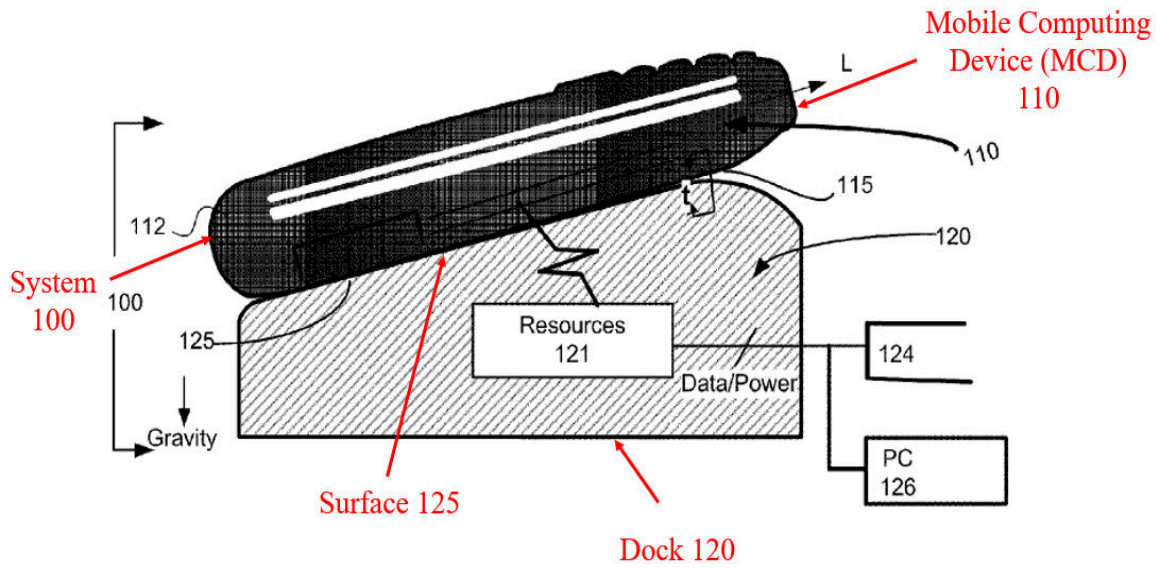


FIG. 1A

USAA-1006, FIG. 1A (annotated)

c) Peng-Chatterjee

Peng's HMD (§III.A.1(a)) determines a start of a driving period by assessing whether the HMD is properly oriented by, for example, using sensor data (e.g., GPS, position information). USAA-1005, [0075]-[0077], [0152]-[0153], [0057]-[0065], Figs. 4, 6A; USAA-1003, ¶¶133-160. To the extent that proper orientation is confirmed, Peng's HMD "collect[s] and evaluat[es] driving behavior data and/or driving environment data, and provid[e] feedback," including calculating and providing "driving behavior metrics and/or scores." USAA-1005, [0001], [0068], [0021]; USAA-1003, ¶¶133-160. Peng also contemplates interrupting data collection if the HMD becomes improperly oriented. USAA-1005, [0036]-[0037], [0040]-[0041], [0152]-[0153]; USAA-1003, ¶¶133-138. Despite this, Peng

describes positioning the device on a flat surface of a console (Fig. 1) or in a cup holder (Fig. 6A), leaving the device vulnerable to orientation changes caused by vehicular movements that could consequently interrupt Peng's data collection.

USAA-1003, ¶¶135-138.

A POSITA would have found obvious to improve Peng's system and apply the user interface inputs and sensor detection in Peng's HMD to *prevent* improper orientation from occurring. USAA-1003, ¶138; USAA-1005, [0036]-[0037], [0067], [0152]-[0153]. A POSITA would have readily understood that an unsecured phone is vulnerable to orientation changes, and given the interruption of data collection that flows in Peng from orientation changes, they would have found it obvious to secure the phone, e.g., using a dock such as that disclosed in Chatterjee. USAA-1003, ¶¶133-143; USAA-1005, Figs. 1, 6A. A POSITA would have also sought practical solutions to ensure reliable modes of charging of the mobile device. USAA-1003, ¶¶133-160 (citing USAA-1507, 291; USAA-1508, 1).

Hence, a POSITA would have found it obvious to improve Peng's system by leveraging a dock, as taught by Chatterjee, to securely attach the mobile device during vehicle use. USAA-1003, ¶¶133-143.

Indeed, a POSITA would have found it obvious to improve Peng's system by leveraging a dock, as taught by Chatterjee, to securely attach the mobile device

during vehicle use. USAA-1003, ¶¶133-149; USAA-1006, Abstract, [0066], [0003]. Also, a POSITA would have been particularly inclined toward a dock configured as suggested by Chatterjee to modify and/or detect orientation of the HMD and the docked/undocked status given Peng's disclosure of orientation detection. *Id.* In the combination, a POSITA would have found it obvious to position a dock of the type described by Chatterjee within a vehicle in a suitable location to releasably attach the mobile device to the vehicle when in use. *Id.* Since mobile phones were often used in moving vehicles, the dock would have advantageously secured the device to a convenient location in the vehicle. USAA-1003, ¶¶138-140; USAA-1502, [0003], [0016], [0006], [0014]; USAA-1006, [0270]; USAA-1516, [0036].

Chatterjee's dock is configured to "receive and retain the mobile computing device" in a mechanical, electrical, and/or logical manner. USAA-1006, Abstract, [0066], [0003], [0056]-[0057], [0060], [0064], [0069]-[0070]; USAA-1003, ¶¶139-141. For example, the dock can "utilize[] physical support structures" "to retain the MCD 110 in a docked or mated position." USAA-1006, [0066], [0074]. The dock can also "recharge or supply power to the mobile computing device." USAA-1006, [0003]. The "orientation of the MCD on the dock may be changed by the user for purpose of configuring operations or behavior of one or both devices." USAA-1005, [0036]-[0037], [0067], [0076], [0151]; USAA-1006, [0065].

A POSITA would have been motivated to obtain “proper alignment or orientation of [HMD] 10 within the automobile or vehicle” by removably attaching or affixing Peng’s HMD 10 to the vehicle via Chatterjee’s dock to prevent misalignment and potential disruptions to data collection. USAA-1003, ¶¶140-143; USAA-1005, [0036]-[0037], [0151], FIGS. 1, 6A; USAA-1006, [0002]-[0003], [0006], FIGS. 1-7. A POSITA would have found it obvious to *removably* attach the mobile device to the vehicle because a person typically takes the device along when leaving a vehicle. USAA-1003, ¶¶140-143. Furthermore, a POSITA would have leveraged Chatterjee’s teachings of using a system where the mobile device and/or the dock can logically (e.g., inductively) couple and communicate, e.g., detect whether the mobile device is docked and in its proper orientation/position. USAA-1003, ¶¶133-143; USAA-1006, [0092], [0097]-[0098], [0104], [0200]-[0232]. Thus, in the combination, the HMD would have prompted a user to dock, and verified its proper positioning based on its docking status and orientation prior to collecting driving data. *Id.*

In this way, it would have been obvious to a POSITA to have extended Peng’s teachings to incorporate the dock in the determination of a start of a driving period based on whether the HMD was properly docked during vehicle usage, as taught by Chatterjee. USAA-1003, ¶¶135-143. It would have been obvious to configure the combination device to “trigger[] the start and stop...of driving data

collection” based on whether the device is removably attached (e.g., docked) to the dock when determining whether it is properly oriented. *Id.*; USAA-1005, [0036].

As illustrated below, a POSITA would have found it further obvious to configure Peng-Chatterjee to prompt user inputs by requesting that the user place the HMD in a proper orientation on the dock as a way to releasably, yet securely, affix the HMD to the vehicle and maintain the proper orientation when the vehicle is moving. USAA-1005, Fig. 6A; USAA-1006, [0066], [0205]; USAA-1003, ¶¶143-144. Accordingly, it would have been obvious that the combination device determines a start of a driving period based on user inputs (e.g., inputs to user interface displayed prompts) for properly orienting the device and/or adjusting the device’s orientation when releasably attaching (e.g., docking) the device to the dock. USAA-1003, ¶¶143-144; USAA-1006, [0174]-[0176], Fig. 15.

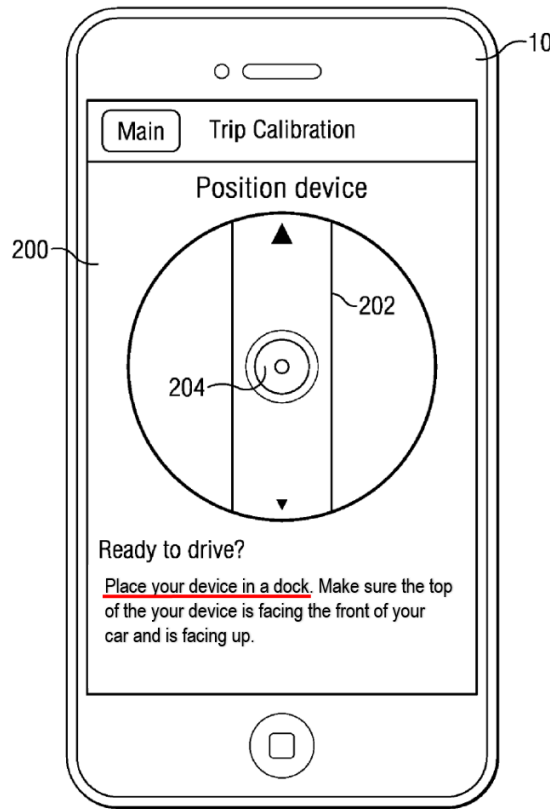


FIG. 6A

USAA-1005, Fig. 6A (modified to illustrate the combination)

Additionally, a POSITA would have found it obvious to configure the combination device to include one or more sensors (e.g., accelerometer and/or GPS sensors described by Peng) to determine the orientation angle and relative position status of the mobile device with respect to the vehicle, and to have leveraged those same sensors to determine a start of a driving period, e.g., when the device is releasably attached (e.g., docked) during vehicle usage in at least two ways.

USAA-1003, ¶¶145-147; USAA-1005, [0036]-[0038], [0151]-[0152], [0040], [0067], Fig. 6A; USAA-1006, [0092].

First, it would have been obvious for a POSITA to have applied Peng's teachings of using the HMD's positional (e.g., GPS) sensor data in the combination device to determine a start of a driving period when the HMD is properly docked during vehicle usage. USAA-1003, ¶¶148-149 (citing USAA-1032, 1-7); USAA-1005, [0037]; USAA-1006, [0092], [0097]-[0098].

Second, it would have been obvious for a POSITA to have similarly applied Peng's teaching for using the combination device's accelerometer to determine a start of a driving period based on proper docking of the device during vehicle usage. USAA-1003, ¶148; USAA-1005, [0151]; Fig. 6A; USAA-1006, [0070], [0092], [0097]-[0098], [0104], [0106], [0182]-[0191], [0198]; USAA-1013, 3:1-10, 4:21-33, Figs. 1, 4; USAA-1003, ¶¶133-151.

The POSITA would have found obvious that enhancing Peng's system to implement a dock, as taught by Chatterjee, to determine a start of the driving period while the device is removably attached to a vehicle via a dock and while the vehicle is in use, would introduce multiple advantages, including:

1. increased reliability of securely holding the device in a desired/prescribed orientation and maintaining that orientation during data collection while the vehicle moves (USAA-1003, ¶¶151-157; USAA-1006, [0066], [0070]; USAA-1005, [0036], [0040]);
2. enhanced utility in conveniently "supply[ing] power to the mobile

computing device” while it is securely attached to the vehicle

(USAA-1003, ¶153; USAA-1006, [0003], [0060], [0067]; USAA-1005, Fig. 1; USAA-1502, [0003]);

3. enhanced utility in logically linking the device to the dock “through one or more connector-less connection” (USAA-1003, ¶154; USAA-1006, [0060], [0064], [0003], [0047]; USAA-1005, [0021], [0014], Fig. 5; USAA-1502, [0003]);
4. increased safety because, in the combination, when the device is being used by a person within the moving vehicle, the dock can allow the device to be rigidly mounted to the vehicle (USAA-1003, ¶155; USAA-1005, Figs. 1, 6A; USAA-1006, [0066]; USAA-1502, [0003]; USAA-1516, Abstract, [0004]-[0005]);
5. increased convenience for a user to operate single-handedly the device while it is rigidly mounted to the vehicle (USAA-1003, ¶156; USAA-1005, Figs. 1, 6A; USAA-1006, [0192]; USAA-1502, [0007], [0013], [0003]); and
6. reduced noise and error in the collected data and reduced complexity in processing the data by eliminating/minimizing movement of the device itself (USAA-1003, ¶157; USAA-1005, [0037]-[0038]; USAA-1516, [0036], [0038]).

One or more of these and other advantages would have motivated a POSITA to combine the teachings of Chatterjee and Peng in a manner enabling the combination device to determine a start of the driving period while the device is removably attached to a vehicle via a dock and while the vehicle is in use. USAA-1003, ¶¶158-160; USAA-1005, [0036]-[0037], Figs. 1, 5, 6A; USAA-1006, [0003], [0005], [0007], [0011], [0013]-[0014].

Configuring the proposed combination to leverage the teachings of Chatterjee and other related art for using and applying a dock in a vehicle was well within the skill of a POSITA, and merely involves the use of a known technique of attaching a dock to a vehicle and combining prior art elements according to known methods to yield the predictable results described above. *KSR v. Teleflex*, 550 U.S. 398, 417 (2007); USAA-1003, ¶¶159-160.

Furthermore, the elements of the resulting combination would each generally perform functions they had been known to perform prior to the combination. USAA-1003, ¶¶133-160.

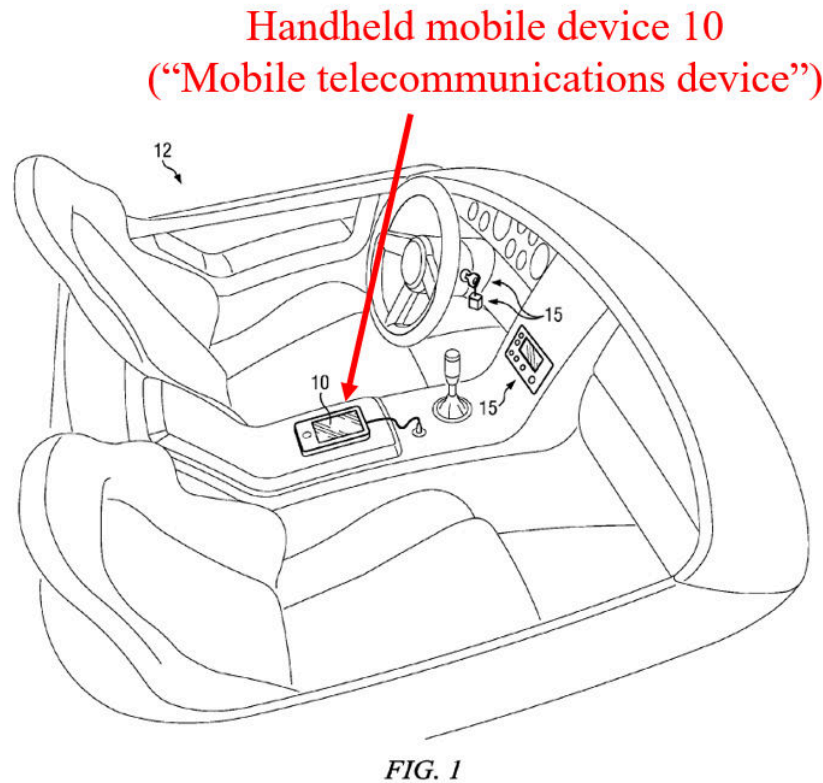
2. Claims 1, 2, and 4

a) Claim 1

[1.1]

Peng-Chatterjee renders the preamble obvious. USAA-1003, ¶¶161-164. As shown below, Peng's HMD 10 ("***mobile telecommunications device***") includes

“any type of portable or **mobile electronics device**, such as...a mobile telephone,”
e.g., “a smart phone, such as an iPhone.” USAA-1003, ¶¶161-164; USAA-1005,
[0019], [0033], FIG. 1.



USAA-1005, FIG. 1 (annotated)

Thus, a POSITA would have found it obvious that Peng-Chatterjee includes
a mobile telecommunications device. USAA-1003, ¶162; USAA-1005, [0019],
[0033], FIGS. 1, 5, 6A-6G; *see also* USAA-1036, 1-4, 6-8, 10-12; USAA-1016,
¶¶[0046]-[0063], FIG. 3; USAA-1034, 37-63; USAA-1036, 6-7, 32-51, 103-108;
USAA-1036, 36, 103-108, 54, 106.

A POSITA would have found obvious based on Peng's disclosure (§III.A.1) to have configured the Peng-Chatterjee combination to "provide one or more features of a driving analysis system, such as (a) **collection of driving data** (e.g., data regarding driving behavior and/or the respective driving environment)" ("**configured to log driving information associated with a vehicle**"). USAA-1005, [0020]; USAA-1003, ¶161. Furthermore, Peng-Chatterjee would have been obviously configured to include a driving analysis application 50 that "manage[s] the collection of driving data," such as "collect[ing] such data from any number and types of data sources, including (a) data sources provided by [HMD] 10..., (b) data sources in vehicle 12 but external to [HMD] 10...and/or (c) data sources external to vehicle 12[.]" USAA-1003, ¶¶161-163; USAA-1005, [0032]-[0033], [0042], [0020]-[0022], FIGS. 2, 6A-6G.

Thus, Peng-Chatterjee renders obvious logging driving information associated with a vehicle. USAA-1003, ¶¶161-164; USAA-1005, [0019]-[0022], [0032]-[0033], FIGS. 1-2, 6A-6G.

[1.2]

As shown in Peng's Figure 2, a POSITA would have found obvious to have configured Peng-Chatterjee's mobile device combination to include one or more sensors 34, including built-in accelerometer 54, location tracking system 56, e.g., GPS tracking system, a camera, and voice activated interfaces. USAA-1003,

¶¶165-166; USAA-1005, [0021], [0023], [0029], [0031], FIG. 2; USAA-1036, 6-7, 103-104, 124.

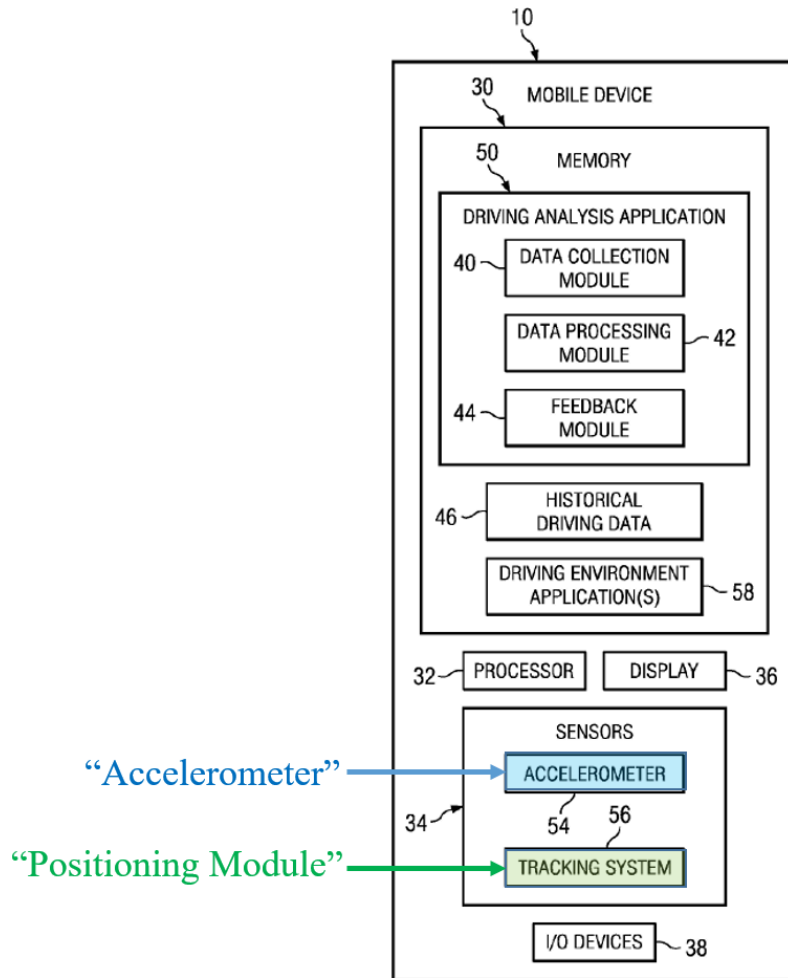


FIG. 2

Peng, FIG. 2 (annotated)

[1.3]

Peng-Chatterjee renders obvious a user interface. USAA-1003, ¶¶167-170.

Peng discloses using “input/output devices 38 (e.g., a **touchscreen display 36**, **keys, buttons, and/or other user interfaces**).” USAA-1005, [0062], [0063], FIGS. 6A-6G.

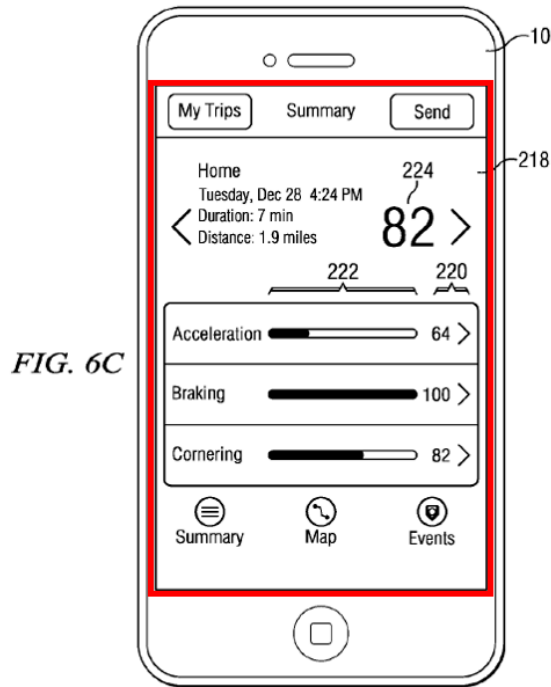


FIG. 6C

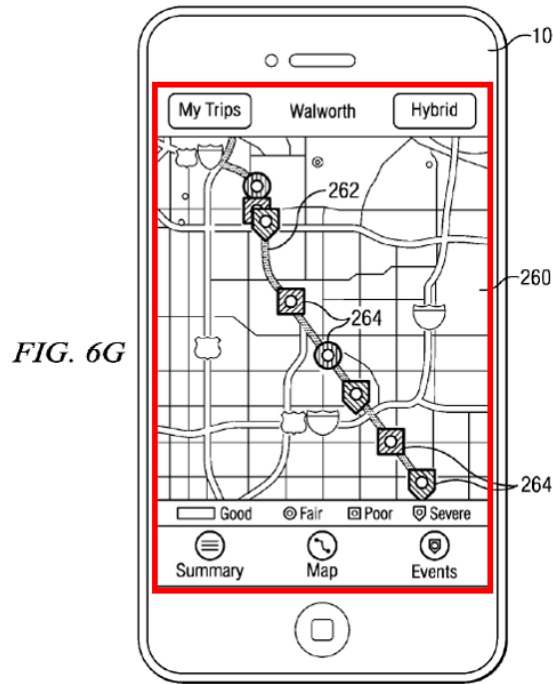


FIG. 6G

USAA-1005, FIG. 6C (annotated, left), FIG. 6G (annotated, right)

In the combination, it would have been obvious to include “[i]nput/output devices” having “**any suitable interfaces allowing a user to interact with [HMD] 10, and in particular, with driving analysis application 50.**” USAA-1005, [0031], [0163], [0019] (“iPhone”), [0023], [0059], FIG. 6G; USAA-1003, ¶¶167-170.

Peng-Chatterjee renders obvious a mobile device that uses a touchscreen and various graphical user interfaces to interact with a driving application. USAA-1003, ¶¶167-170; USAA-1005, [0030]-[0031], [0034], [0039], [0062], [0066], [0070].

[1.4]

As shown below, Peng-Chatterjee renders obvious that HMD includes one or more processors to execute driving analysis application 50 and calculate...metrics related to the driver's driving behavior. USAA-1003, ¶¶171-172; USAA-1005, [0006], FIGS. 2-3; *see also id.*, Abstract, [0006]-[0008], [0025], [0028]-[0029], claims 1-14, 27.

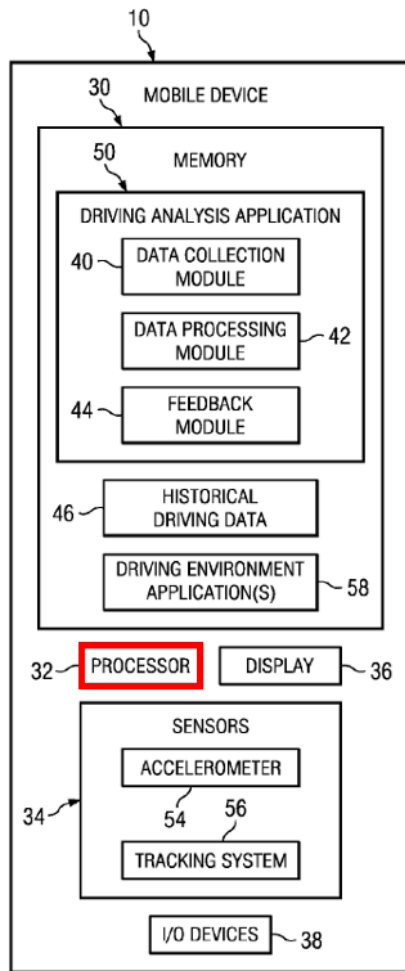


FIG. 2

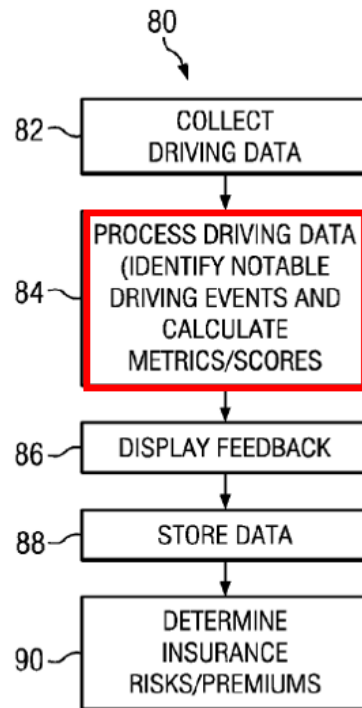


FIG. 3

USAA-1005, FIG. 2 (annotated, left), FIG. 3 (annotated, right)

[1.5]

Based on Peng's disclosure, Peng-Chatterjee renders obvious that HMD

includes memory 30 for storing computer readable instructions and data associated with its application 50. USAA-1003, ¶¶173-174; USAA-1005, [0025]-[0026], [0006]-[0008], [0028]-[0029], [0073], Abstract, [0032], [0058], [0071], [0142], Claims 1-13, FIGS. 2-4.

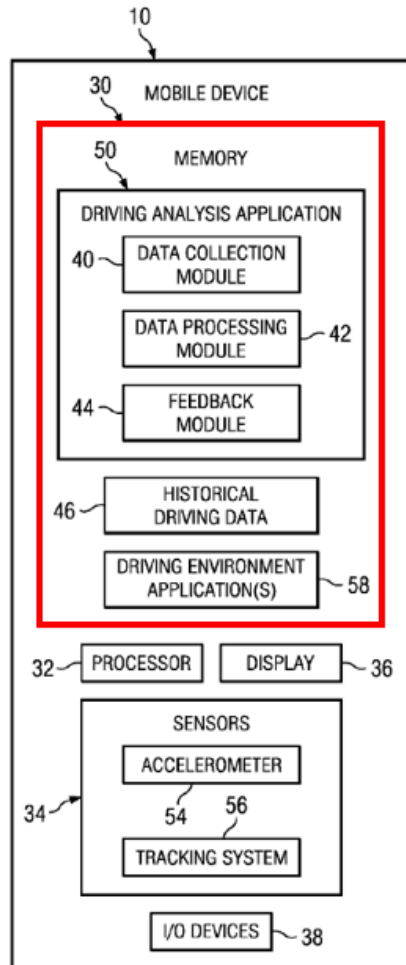


FIG. 2

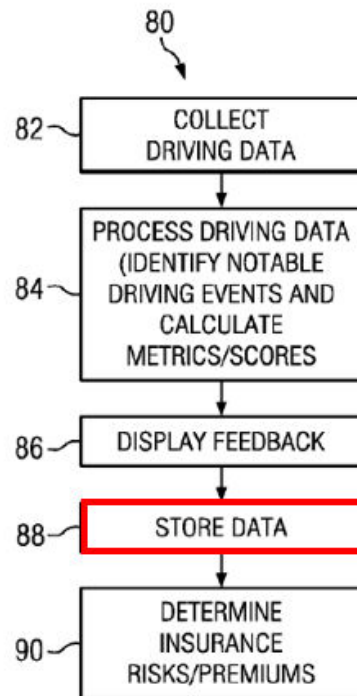


FIG. 3

USAA-1005, FIG. 2 (annotated, left), FIG. 3 (annotated, right)

[1.6]

As discussed (*supra* §III.A.1) and for reasons further discussed below, Peng-Chatterjee renders obvious this element. USAA-1003, ¶¶175-182. Based on

disclosure by Peng and Chatterjee, a POSITA would have found it obvious to configure the Peng-Chatterjee HMD to communicate with its dock and to use inputs received by the user interface and its sensors (e.g., accelerometer and GPS, as disclosed by Peng) to determine a start of a driving period is based on whether it is properly docked during vehicle usage. *Id.*; *see also* USAA-1003, ¶¶175-176.

Regarding inputs received by the user interface, based on Peng, when “starting [] data recording (i.e., starting a data collection session), a screen or image for starting data recording may appear upon the [HMD] 10 being properly oriented.” USAA-1005, [0152]. Using this screen, user inputs are received in the form of “manual instruction” (“*inputs received by the user interface*”), e.g., “a user pressing a ‘Start Recording’ button that is displayed” on HMD 10 can “start (or re-start) collection of driving data.” *Id.*, [0152], [0066], [0154]. A POSITA would have been motivated to use the manual instruction in the combination device to start data recording for efficient recording, e.g., conserve the battery life during data collection or to confirm that proper orientation has been obtained. USAA-1003, ¶¶175-177. Additionally, it would have been obvious to a POSITA to have configured the combination to interact with and receive user input via a user interface to confirm a readiness to collect driving data when determining proper orientation to prevent the premature/unintended collection of driving data. USAA-1003, ¶¶175-177; USAA-1005, [0037], [0030], [0076], FIG. 4.

Furthermore, regarding determining a start of a driving period during vehicle usage based on sensor data, a POSITA would have found it obvious, based on Peng's disclosure, to further configure the Peng-Chatterjee device to "start and/or stop collection of driving data in response to determining that the [HMD] 10 is likely travelling in an automobile, e.g., **based on a real time analysis of data received from accelerometer 54, location tracking system 56, or other sensors 34** provided by [HMD][.]" USAA-1003, ¶¶175-176; USAA-1005, [0035], [0077], [0029]. Additionally, a POSITA would have found it obvious based on Peng (*supra* §III.A.1) to additionally configure the combination device to "determine the orientation of [HMD] 10" using sensor data as part of its assessment of whether the mobile device is ready to start data recording ("*a start of a driving period*"). USAA-1005, [0153], [0034]; USAA-1003, ¶¶176-177. Furthermore, it would have been obvious that Peng-Chatterjee "determine[s] the orientation of [HMD] 10 within the vehicle" using device 10's sensor data (e.g., angular orientation, GPS, and position information) ("*sensor data from the sensor set*") since the combination device's sensor set integrates sensor functionality, as taught by Chatterjee, to enable detection of docking and orientation on the dock. USAA-1005, [0037], [0151], USAA-1006, [0092]; USAA-1003, ¶¶176-178. Suitable "physical orientation (e.g., angular orientation) of the Peng-Chatterjee combination relative to the automobile orientation" can be graphically shown to the user by indicators,

e.g., “alignment image 202.” USAA-1005, [0151], [0037].

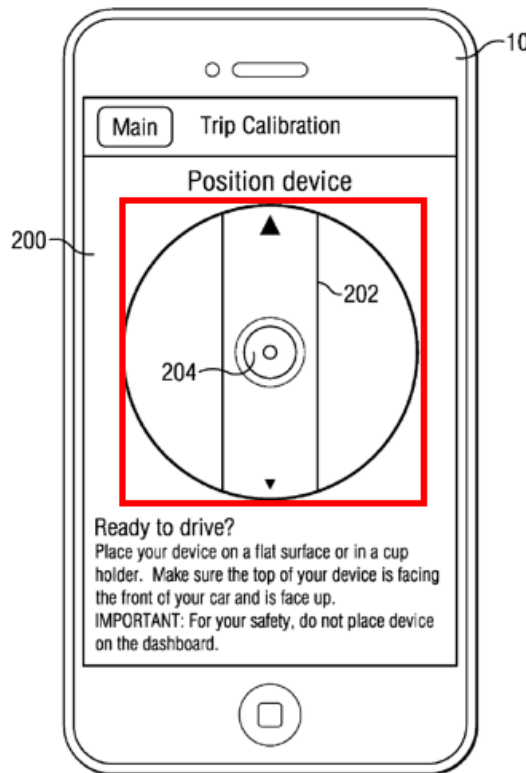


FIG. 6A

USAA-1005, FIG. 6A (annotated)

Thus, from these disclosures, a POSITA would have found obvious to configure the Peng-Chatterjee’s handheld mobile to determine a start of a driving period, e.g., starting a data collection session on the device, during vehicle usage, based on a combination of the above-noted inputs received by the user interface and the above-noted sensor data from sensor set. USAA-1003, ¶¶179-181; USAA-1005, [0035], [0037], [0076]-[0077], [0029], [0151]-[0153], [0066], [0154], FIG. 6A.

Furthermore, as discussed (*supra* §III.A.1(c)), it would have been obvious to

a POSITA to configure the combination device to determine the start of the driving period during which the device was removably attached to the vehicle and the vehicle was being used based on both Peng and Chatterjee's teachings. USAA-1003, ¶¶175-182. As discussed, the Peng-Chatterjee device can use its sensors (e.g., accelerometer, GPS) and communicate with the dock to ensure proper docking/orientation within a moving vehicle as a basis for resolving/determining a start of a driving period during vehicle usage. *Id.* Peng-Chatterjee would have rendered obvious a driving period during which the HMD 10 is removably attached to the vehicle via a dock and the vehicle is moving (or otherwise in use) for multiple reasons, e.g., maintaining a preferred orientation of the HMD, supplying power to the HMD, minimizing noise and data collection interruptions, and securely attaching the HMD 10 within the vehicle in a safe, convenient, and reliable manner. *Id.*

[1.7]

Peng-Chatterjee combination renders obvious that the application 50 is configured to enable the mobile device to obtain, based on sensor data (e.g., acceleration) from the sensors set (e.g., "accelerometer"), "data regarding driving behavior and/or the driving environment." USAA-1003, ¶¶183-186; USAA-1005, [0021]-[0022], [0029], [0069], [0039], FIG. 4. Application 50 would be configured to "process any or all of this driving data" during the driving period ("***process the sensor data from the sensor set during the driving period***") to derive and store

“calculate[d] filtered or averaged driving behavior metrics,” such as “acceleration, braking, cornering, etc.,” associated with the “collected driving data” (“*derive driving information associated with how the vehicle is driven*”) of a user (e.g., “the driver”). USAA-1003, ¶¶183-186; USAA-1005, [0021]-[0022], [0039], [0069], FIG. 4; *see also* USAA-1005, [0022], [0064], [0165].

As shown in FIG. 4, a POSITA would have found it obvious that application 50 enables Peng-Chatterjee to “Process Trip Data” by, “e.g., Filter[ing] Data and Calculat[ing] [driving behavior] Metrics” (“*derive driving information*”). USAA-1003, ¶¶183-184; USAA-1005, [0074], [0044], FIG. 4.

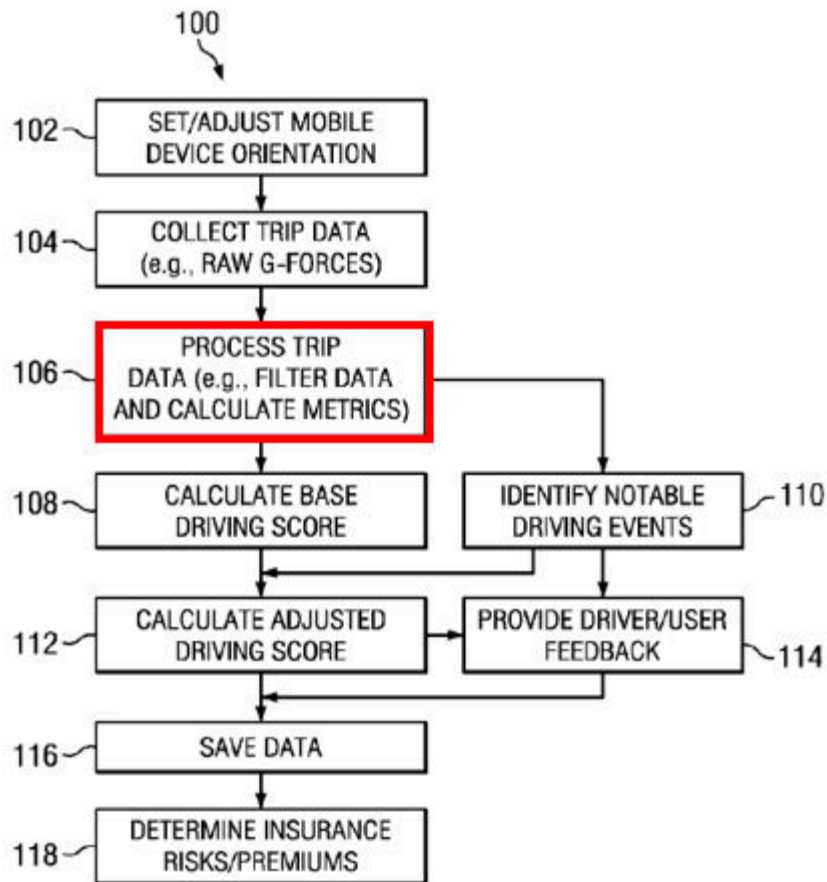


FIG. 4

USAA-1005, FIG. 4 (annotated)

From at least these descriptions, a POSITA would have found obvious that application 50 causes Peng-Chatterjee's HMD to process sensor data from the sensor set during the determined driving period to derive the "calculated driving behavior metrics" ("*driving information associated with how the vehicle is driven*").

USAA-1003, ¶¶183-186; USAA-1005, [0044], [0071], [0073].

[1.8]⁸

A POSITA would have found it obvious to configure application 50 to cause the Peng-Chatterjee device to store a selection of that driving information (e.g., “data... for display” and “calculated driving behavior metrics”) to memory (e.g., “local volatile memory for display, in local non-volatile memory as historical driving data 46, and/or in remote memory as historical driving data 152”). USAA-1003, ¶¶187-189; USAA-1005, [0044], [0058], [0071].

Specifically, it would have been obvious that Peng-Chatterjee would be configured to “manage the storage of **any** of the data collected by data collection module 40 at step 104 (e.g., raw data or filtered raw data),” in which the device “may manage short-term storage of **certain** data... and may further manage long-term storage of **certain** data[.]” USAA-1003, ¶¶187-189; USAA-1005, [0071], [0073], [0058], [0042]. For example, Peng discloses that data can be stored in a “local volatile memory for display, in local non-volatile memory as historical driving data

⁸ The reference to “selection” of driving information results from improper inferential claiming and is non-limiting since such selection is not one of the operations recited to be performed by the “mobile telecommunications device.” *Ex Parte Sullivan*, Appeal No. 2002-1924 (PTAB June 20, 2016). To the extent it deemed limiting, the combination renders it obvious as discussed herein.

46, and/or in remote memory as historical driving data 152.” USAA-1005, [0071], [0073]; USAA-1003, ¶¶187-189.

Thus, a POSITA would have understood that data stored in the device’s memory includes “a selection of the driving information.” USAA-1003, ¶¶187-189; USAA-1005, [0071], [0073].

[1.9]

As discussed (*supra* [1.8]), it would have been obvious to have configured Peng-Chatterjee’s HMD, via application 50, to process sensor data from the sensor set during a determined driving period to derive “driving behavior metrics and/or scores” for various applications. USAA-1003, ¶¶190-194; USAA-1005, [0022], [0064], [0165].

The Peng-Chatterjee device would have been obviously configured to “collect [driving behavior] data from sources, including (a) data sources provided by [HMD] 10...(b) data sources in vehicle 12 but external to [HMD] 10...**and/or** (c) data sources external to vehicle 12.”⁹ USAA-1005, [0033], [0034], [0029];

⁹ It is sufficient for the prior art to show that an element is optional to satisfy a negative limitation. *WAG Acquisition, LLC v. WebPower, Inc.*, No. 2018-1617 at 12 (Fed. Cir. 2019) (“While [prior art] does not specify that [an element] is not used,

USAA-1003, ¶163, ¶¶190-191.

In one example, a POSITA would have obviously configure Peng-Chatterjee mobile device to use “real time analysis of data received from accelerometer 54, location tracking system 56, or other sensors 34 provided by [HMD]....” USAA-1005, [0035]; USAA-1003, ¶¶191-192. Specifically, in the combination, the device can collect “the current acceleration of [HMD] 10 from accelerometer 54,” “the current location of [HMD] 10 from location tracking system 56 (e.g., whether [HMD] 10 is located on/near a roadway),” and “the velocity of [HMD] 10 from location tracking system 56.” USAA-1005, [0035], claim 27; *see also id.*, claims 1, 5, 14, 18), FIG. 2. Furthermore, the combination device would be “operable to process or analyze any of the driving data...collected by [HMD] 10 itself” and “based on such collected driving data, calculate one or more driving behavior metrics and/or scores.” *Id.*, [0044].

A POSITA would have found obvious that, based on the above examples, the combination device derives driving information without data from the vehicle sensors, at least because some of those examples focus only on leveraging motion data obtained from one or more sensors provided by the mobile phone (e.g.,

nothing in the record suggests that [the element] *must* be used.”)(emphasis in original).

sensors 34) to derive filtered data and/or driving behavior metrics (“*driving information*”). USAA-1003, ¶¶192-193; USAA-1005, [0044], [0035].

Further, from Peng’s teaching, 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 sensor set. USAA-1003, ¶¶190-194; USAA-1026, 11:15-25.

[1.10]

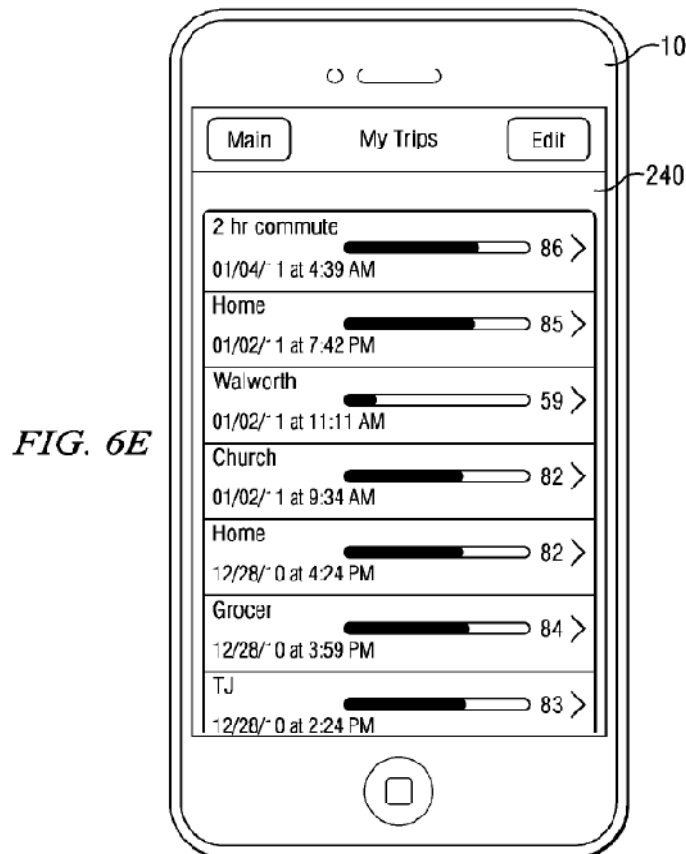
See [1.7]. Peng-Chatterjee’s HMD “may include...a driving analysis application,” (“*application*”), which can be “downloaded via the Internet,” and “process...driving data collected by [HMD]...to calculate one or more driving behavior metrics and/or scores[.]” USAA-1003, ¶¶195-200; USAA-1005, [0022], [0027], [0074], [0143]. As explained by Dr. Michalson, it would have been readily understood by a POSITA reading Peng that the mobile device 10 is controlled by application 50 because Peng explains that the application is embodied in the software, firmware, and/or computer-readable instructions and controls the mobile device via multiple modules. USAA-1003, ¶195; USAA-1005, [0026], [0032], FIG. 2.

The ’271 Patent indicates the “start of the driving period determines when

the recording of sampled sensor data begins.” USAA-1001, 18:30-32. The ’271 Patent further states “the device is arranged to log driving information associated with the vehicle, when that vehicle is being driven,” which is “realised by registering the start of the driving period during which the mobile device is installed to the vehicle and the vehicle is being driven by the driver.” *Id.*, 3:12-21 (“Advantageously, this prevents driving information from being needlessly recorded. As will be appreciated the mobile device has only a finite storage capacity and so registering the start of the driving period is useful for minimising the unnecessary usage of memory.”). Like the ’271 Patent, with reference to FIG. 6E (below), Peng describes the logging driving information by registering the start of the driving period. For example, Peng not only discloses determining a start of a driving period as discussed in [1.6], but also logging/storing and displaying the start of the driving period (“**session start time**”) as shown in FIG. 6E. USAA-1005, [0161], FIG. 6E; *see also id.*, [0155], FIG. 6C; USAA-1003, ¶¶195-196. For each session, the display shows a trip description, trip date, trip time, and driving score. *Id.* The trip time includes “**session start time**, end time, or midpoint” (“**start of the driving period**”). *Id.* In this way, Peng teaches or renders obvious “registering the start of the driving period” at least because the displayed session start time would necessarily or obviously require the session start time being registered by the mobile device. *Id.*; USAA-1003, ¶¶195-196.

The '271 Patent further states that “[t]he initialisation input may be generated automatically in response to the sensor data having predetermined values,” such as “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, 3:32-38. Regarding an initialization input, Peng explains that “[t]riggering signals” can “indicate the start or stop of a driving trip” (“*in response to an initialization input*”). USAA-1005, [0035]. Peng further teaches that the “data collection module 40” of application “may automatically start and/or stop collection of driving data in response to determining that the [HMD] 10 is likely travelling in an automobile, e.g., based on a real time analysis of data received from accelerometer 54, location tracking system 56, or other sensors 34 provided by [HMD] 10.” *Id.*, [0033]-[0035]. Based on Peng’s description, a POSITA would have understood or found obvious that, in response to determining, based on sensor data, that the mobile device is traveling in a vehicle, a driving trip would start (starting collection of driving data), which would be indicated by triggering signals. *Id.*; USAA-1003, ¶¶195-196. Moreover, as evidenced by, e.g., Figures 6C and 6E, the driving trip, or data collection session, is then logged with a summary that includes the “session start time.” USAA-1005, [0155], [0161]. A POSITA would have understood that the logging of the data collection session occurs in conjunction with the determination of the start of the driving trip. *Id.*;

USAA-1003, ¶196. Thus, in this way, the mobile device registers the start of the driving period (e.g., by logging the session start time) in response to an initialization input (triggering signal) generated automatically in response to determining that the mobile device is likely traveling in a vehicle based on sensor data (e.g., accelerometer 54, location tracking system 56). *Id.*



USAA-1005, FIG. 6E

Like the '271 Patent, Peng explains that an algorithm can determine “whether [HMD] 10 is likely travelling in an automobile based on data from accelerometer 54 and/or location tracking system 56, e.g., by analyzing ... *the velocity*

of [HMD] 10 from location tracking system 56....” USAA-1005, [0035]; USAA-1001, 3:32-38. As Dr. Michalson explains, it would have been obvious to a POSITA that determining whether the mobile device is traveling in an automobile by analyzing the velocity data using the device 10’s sensors would obviously include a comparison of the analyzed velocity data against predetermined velocity thresholds.” USAA-1003, ¶¶197-200; USAA-1005, [0035], FIG. 2. That is, if the location tracking system 56 sensed a velocity greater than a predetermined threshold (e.g., greater than 10 mph), then the mobile device in the combination would likely be in a moving vehicle, triggering a signal that causes the recording to begin and the start time to be logged, as shown in Figures 6C and 6E. USAA-1003, ¶¶195-200; USAA-1005, [0035], FIGS. 6C, 6E.

b) Claim 2

[2]

Peng-Chatterjee renders this element obvious. USAA-1003, ¶¶201-203. First, while the outer bounds of the phrase “register the attachment” as used in claim 2 are not entirely clear, the ’271 Patent describes at least the use of a “registration module” to “register the installation of the mobile device to the vehicle,” such as through the use of “a proximity sensor to detect the proximity of the mobile device to the vehicle.” USAA-1001, 3:38-46. Similar to the ’271 Patent’s disclosure, Peng teaches that its mobile device includes “proximity

sensors.” USAA-1005, [0029]. Chatterjee explicitly teaches that its dock detects the MCD. USAA-1006, [0238] (“When the MCD 2020 is placed on the dock 2000, it inductively signals back a response to the dock 2000. The response enables the dock 2000 to detect the MCD 2020.”), Abstract (“processing resources are configured to **detect placement of the mobile computing device** on the receiving surface”), [0270], FIG. 33. Chatterjee additionally teaches that the MCD can “include sensors or detectors that detect contact with the dock.” *Id.*, [0112], [0182]. As such, a POSITA would have been motivated to modify the Peng mobile device to leverage its proximity sensors to register the contact between the mobile device and dock, as taught by Chatterjee. USAA-1003 ¶¶201-203; USAA-1005, [0029]; USAA-1006, [0182]. Chatterjee explains that the uses of the sensors or detectors can assist in determining the orientation of the mobile device, based on which detectors are active. USAA-1006, [0182]. This orientation-related information would be advantageous to the Peng-Chatterjee device for at least the reasons discussed above in §III.A.1(c) (e.g., preventing improper device orientation). The use of Peng’s proximity sensors to detect the dock would also advantageously help to confirm that the device is connected to a vehicle. USAA-1003, ¶¶201-203. Configuring Peng’s mobile device to leverage Chatterjee’s teachings of using Peng’s mobile device’s proximity sensors in this manner would have required only routine programming knowledge, which was well within the

skill of a POSITA prior to the earliest effective filing date. USAA-1003, ¶201.

Furthermore, the elements of the resulting combination would each perform functions they had been known to perform prior to the combination. USAA-1003, ¶203. Accordingly, a POSITA would have naturally expected success when incorporating Chatterjee's teachings into Peng's mobile device, as described above. USAA-1003, ¶¶201-203.

Additionally, a POSITA would have understood that the Peng-Chatterjee combination includes a dock affixed to a vehicle such that detecting that the mobile device is in proximity of the vehicle-connected dock can register attachment of the mobile device to the vehicle. USAA-1003, ¶204; *supra* III.A.1.

Next, Peng teaches "determin[ing] the orientation of [HMD] 10 within the vehicle by comparing GPS and position information for the [HMD] 10 with GPS and position information for the vehicle 12." USAA-1005, [0037]. That is, Peng already teaches that the GPS information of the mobile device is compared with the GPS information of the vehicle. *Id.* It would have been obvious to a POSITA for the Peng-Chatterjee mobile device to compare the mobile device GPS information with the vehicle GPS information to further confirm the proximity of the mobile device to the vehicle before unnecessarily storing sensor data. USAA-1003, ¶203; USAA-1005, [0035]. That is, because Chatterjee's dock could be detached from one vehicle and moved to another, it would be desirable not to rely

solely on proximity of the mobile device to the dock, but to further confirm that the mobile device and the vehicle are co-located before collecting driving data. *Id.*; USAA-1003, ¶¶201-205.

c) Claim 4

[4.1]-[4.9]

Peng-Chatterjee renders obvious claim elements [4.1]-[4.9] for at least the reasons discussed above with respect to the claim elements [1.1]-[1.9] applied in Ground 1A. Peng-Chatterjee additionally renders obvious claim elements [4.10]-[4.11] for at least the reasons discussed below. USAA-1003, ¶¶206-214

[4.10]

As discussed (*supra* [1.7], [1.10]), Peng-Chatterjee's HMD "may include...a driving analysis application" ("***downloaded application***") that can "process...driving data collected by [HMD][.]" USAA-1003, ¶¶215-218; USAA-1005, [0022], [0074], [0143]. Specifically, the mobile device includes a "data collection module 40" to "collect driving data during a data collection session (which may correspond to a driving trip, a portion of a driving trip or multiple driving trips)," including "driving behavior data collected by accelerometer 54, location tracking system 56," and the like ("***sensor data from the sensor set during a plurality of driving periods***"). USAA-1005, [0066]. The mobile device also includes a "data processing module 42" for "determining representative metric/scores corresponding to **a group of data collection sessions**," where the "data processing module 42 may

process the collected data in real time or substantially in real time” (“*process ... during a plurality of driving periods to derive driving information*”). USAA-1005, [0035], [0044]-[0045], [0068], [0069] (“**a group of data collection sessions**”), [0073], [0146], FIGS. 6C, 6E-6F, [0046]-[0053]. A POSITA reading Peng would have understood that the driving behavior metrics and/or scores for the data collection sessions (“*plurality of driving periods*”) are associated with how the vehicle is driven during the driving periods. USAA-1003, ¶217. Preliminarily, Peng describes the metrics as “driving *behavior*” metrics. USAA-1005, [0022], [0044]-[0045], [0155]-[0156]. Moreover, Peng explains that the driving behavior metrics and driving score are based on “driving *behavior* data collected by the built-in accelerometer (and/or other collected data)” during the corresponding driving period. *Id.* Additionally, Peng teaches that its driving analysis application may “display tips to help drivers improve their driving behavior,” which a POSITA would have understood as improving *how the vehicle is being driven*. USAA-1003, ¶¶215-218; USAA-1005, [0023]-[0024], [0060].

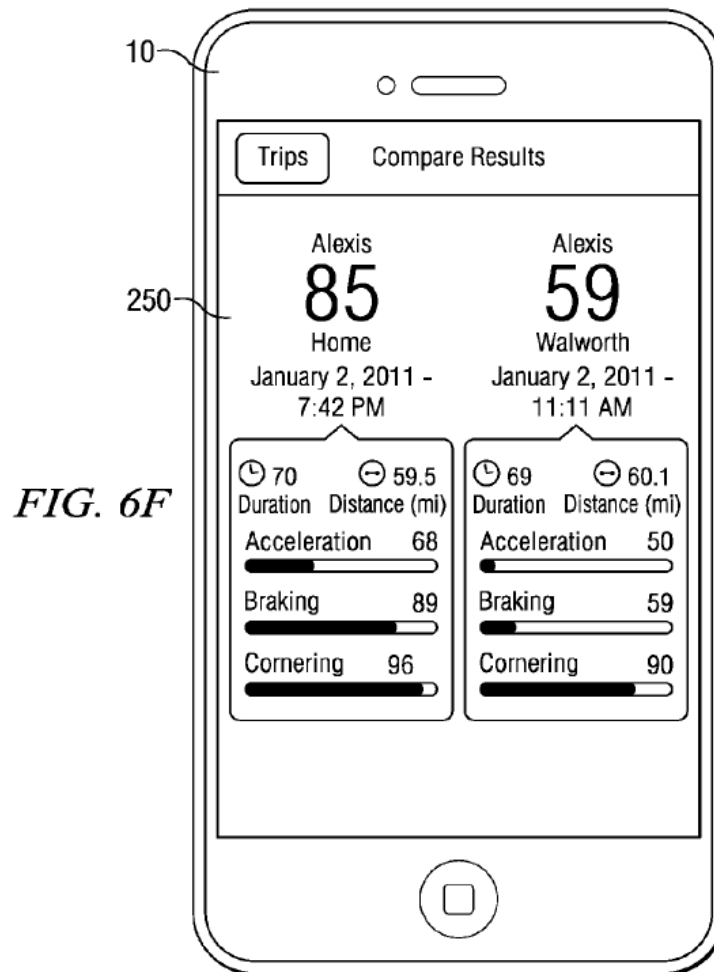
[4.11]

Peng’s data processing module 42 “calculate[s] individual driving behavior metrics ... and/or driving scores for individual data collection sessions” and “group-session metrics/scores [] using averaging, filtering, weighting, and/or any other suitable algorithms for determining *representative* metrics/scores

corresponding to a group of data collection sessions.” USAA-1003, ¶¶219-220;

USAA-1005, [0045], [0046]-[0052].

Moreover, in Figure 6F, Peng teaches that “multiple trips can be compared,” including, e.g., “two trips by the same driver.” *Id.*, [0162].



USAA-1005, FIG. 6F

Thus, a POSITA would have understood that the Peng-Chatterjee device renders obvious a benchmark defined by sensor data processed during a first set of driving periods (e.g., “a group of data collection sessions” or a trip on the left in

Figure 6F) and against which sensor data during subsequent sets of driving periods (e.g., subsequent data collection sessions or the trip on the right in Figure 6F) are compared. USAA-1003, ¶¶219-222; USAA-1005, FIG. 6F, [0162]. Thus, Peng-Chatterjee renders obvious [4]. USAA-1003, ¶¶206-222.

B. [GROUND 1B] – The Combination of Peng, Chatterjee, and Tamir Renders Claim 3 Obvious

1. Analysis

a) Tamir

Tamir describes a traffic information system that evaluates driver behavior in a vehicle. USAA-1012, Abstract. Tamir discloses data collection techniques that use “a dynamically adjusted rate” based on “the time of day, date, and/or external conditions” and “the driving behavior of the vehicle.” *Id.*; *see*, 20:52-21:11; USAA-1003, ¶120.

b) Peng-Chatterjee-Tamir

Based on Peng’s teaching, “data...may be **time stamped (e.g., time and date)**” and that combination “may calculate the number of each type of [NDE]...for a **particular time period.**” USAA-1005, [0042], [0077]. Dynamic sampling rates were known to provide several advantages to data processing in vehicle monitoring systems, e.g., maintaining measurement precision, high adaptation to different driving conditions, and increased responsiveness. USAA-1003, ¶¶223-224 (citing USAA-1017, 5:61-6:9, 9:3-7; USAA-1018, [0019]; USAA-

1019, 5:1-3). Thus, a POSITA implementing Peng's data collection and processing method would have looked to well-known temporal sampling techniques applicable for data like those being collected by Peng's device 10. USAA-1003, ¶¶223-224.

As discussed (*supra* §III.B.1(a)), Tamir's sampling rate can be adjusted based on conditions associated with data collection (e.g., driving behavior). USAA-1012, 9:10-20, 20:52-21:11. A POSITA would have implemented Tamir's data collection technique to improve the combination by providing "lower power consumption and less wear and tear." USAA-1003, ¶¶223-224; USAA-1012, 20:52-21:2.

2. Claim 3

a) Claim 3

[3]

As discussed (*supra* §III.A.2, [1.8]), the combination renders obvious that a downloaded application controls the mobile device to store the sensor data. USAA-1003, ¶¶225-228; USAA-1005, [0007], [0026], [0034], [0058], [0061], [0071], [0073], [0163].

As discussed (*supra* §III.B.1), a POSITA would have configured the combination to use Tamir's data collection technique to improve Peng-Chatterjee's data storage by using variable sampling rates. USAA-1012, 9:10-20, 20:52-21:11; USAA-1003, ¶¶226-227. Tamir teaches that "when approaching an intersection

and/or a curve, the sampling rate is increased, and after the intersection or curve, the **sampling rate is decreased**” (*down-sample sensor data from a first sampling rate to a second sampling*). *Id.*, 20:56-58. Accordingly, a POSITA would have understood and/or found it obvious that the application in Peng-Chatterjee-Tamir controls the mobile device to down-sample sensor data, as taught by Tamir, and accordingly, store the sensor data at the second sampling rate at least because the adapted sampling rate can increase efficient use of storage resources. USAA-1005, [0071]; USAA-1003, ¶¶225-228.

C. [GROUND 1C] – The Combination of Peng, Chatterjee, and Wilkes Renders Claim 5 Obvious

1. Analysis

a) Wilkes

Wilkes teaches “identif[ying] risky driving situations” and providing feedback to reduce risk and accidents. USAA-1518, [0010]. It describes a mobile device with a GPS and accelerometer for monitoring driving behavior. *Id.*, [0056], FIG. 1. Wilkes further teaches monitoring drivers for situations such as rear end collisions and speed management. *Id.*, [0037] (Table 1); USAA-1003, ¶121.

The mobile device use “risk identification algorithms” “to identify driving risk situations.” *Id.*, [0035]. It detects events using sensor data and “risk identification algorithms” to determine if a threshold value is exceeded. *Id.*, [0034]-[0038]. USAA-1003, ¶¶121-123. Driver interventions 164 and intervention rules

165 are automatically adjusted “according to the general accident risk of each specific driver” (e.g., for drivers identified as more likely to have accidents). *Id.*; USAA-1518, [0041].

b) Peng-Chatterjee-Wilkes

Peng-Chatterjee’s HMD can identify NDEs. *See e.g.*, USAA-1005, [0022], [0034], [0045]-[0053]; USAA-1003, ¶¶229-234. Specifically, Peng explains the HMD’s “[d]ata processing module 42 may identify [NDEs] using any suitable algorithms” that “compare[s] acceleration data from accelerometer 54 (raw or filtered) to one or more predefined thresholds for notable acceleration, braking, or cornering.” USAA-1005, [0053]. NDE identification can be useful to determine insurance quotes. *Id.*, [0004], [0074], [0165]; USAA-1003, ¶¶230-233. The identification of an NDE, such as notable acceleration, can be catered toward a particular vehicle. USAA-1005, [0099]-[0125]. That is, the thresholds used for NDE identification vary depending on whether the vehicle is an Impala or Camaro. *Id.* A POSITA would have understood that NDEs and the associated thresholds may also vary depending on a particular driver and his/her typical driving behavior. USAA-1003, ¶229. Hence, a POSITA would have naturally sought to supplement Peng-Chatterjee’s NDE identification using known event detection techniques to advance Peng’s motivations to provide NDE detection more catered to a particular driver, as Wilkes teaches. USAA-1005, [0053]; USAA-1518, [0040]-[0041];

USAA-1003, ¶¶229-230.

Known vehicle monitoring systems were similarly capable of detecting accidents by the Critical Date. USAA-1003, ¶¶231; USAA-1007, Abstract, 1:40-42, FIG. 3; USAA-1509; USAA-1510; USAA-1511; USAA-1512. For example, as discussed (*supra* §III.C.1(a)), Wilkes describes “[i]dentifying risky driving situations” using “risk identification algorithms.” USAA-1518, Abstract, [0035]. Like Peng, Wilkes similarly teaches using a mobile device with a GPS and accelerometer to monitor driving behavior. *Id.*, [0056], FIG. 1. Like Peng, Wilkes monitors drivers for accidents. *Id.*, [0037] (Table 1). Wilkes further teaches the use of driver interventions and intervention rules associated with the “risk identification algorithms 163 that are “automatically adjust[ed] ... according to the general accident risk likelihood of each specific driver.” *Id.*, [0041], [0044].

A POSITA would have been motivated to modify the “predefined thresholds” of the NDE-identifying algorithms of Peng to account for the driver, as taught by Wilkes, to improve the accuracy of the NDE-detection algorithm. USAA-1005, [0002]-[0004]; USAA-1518, [0045]; USAA-1003, ¶¶231-232. Given the functional capabilities of Peng’s HMD, it would have been obvious to a POSITA to implement the combination device with the risk identification algorithms of Wilkes’ device. USAA-1518, [0034]-[0046]; USAA-1005, [0019], [0020], FIG. 1; USAA-1003, ¶¶232-234.

It would have been obvious to a POSITA to modify Peng's identification of NDEs to consider a user's typical driving behavior. USAA-1003, ¶233; USAA-1005, [0045]-[0052], FIG. 6F, [0162]. A POSITA would have been motivated to combine Peng's NDE algorithms, which include predetermined thresholds, with Wilkes' teaching of modifying thresholds "based on the general risk likelihood of a driver," where the general risk likelihood of a driver is determined by a driving score, or benchmark, for the particular driver, as Peng teaches. USAA-1003, ¶233; USAA-1005, [0045]-[0053]; USAA-1518, [0041]. This modified approach would decrease the possibility of detecting false positives, wasting resources and memory, and false negatives, where crucial data is not saved. USAA-1003, ¶¶233-234.

The combination device would modify the threshold values of its NDE algorithm for each driver depending on the driving score and/or other parameters for that user, providing more accurate, adaptive event detection catered to particular users. USAA-1005, [0022], [0053], [0162]; USAA-1518, [0034]-[0046]; USAA-1003, ¶¶233-234. A POSITA would have had a reasonable chance of success in combining Peng, Chatterjee, and Wilkes since "several vehicle monitoring systems by the Critical Date were similarly capable of providing driver-specific analyses." USAA-1003, ¶232 (citing USAA-1024). Furthermore, the elements of the resulting combination would each generally perform functions they had been known to

perform prior to the combination. USAA-1003, ¶¶229-234; USAA-1005, [0053]; USAA-1518, [0034]-[0046].

2. Claim 5

[5.1]

Peng explains that the data processing module 42 “may identify [NDEs]” (*detect occurrence of a predetermined event*) by “using any suitable algorithms.” USAA-1005, [0053]. An “algorithm may compare acceleration data from accelerometer 54 (raw or filtered) to one or more predetermined thresholds for notable acceleration, braking, or cornering” (“*by correlating the sensor data against at least one event indication model ... comprising a set of predetermined data values that are compared*”). *Id.*; see also *id.*, claims 12 and 25; USAA-1003, ¶235.

[5.2]

Peng explains that parameters used for the identification of NDEs can be modified in response to the type of vehicle. USAA-1005, [0099]-[0125]. For example, threshold values for the event identification can depend on whether the vehicle being driven is an Impala or Camaro. *Id.*, [0115]-[0125]. Given Peng’s use of different threshold values in response to a specific vehicle type, a POSITA would have found it obvious to modify parameters in Peng’s NDE identification in response to a specific driver, as taught by Wilkes, using Peng’s benchmark. USAA-1003, ¶¶236-238. This would further Peng’s goal of “assess[ing] **the risk level associated with a driver,**” and “determining the proper cost of an insurance

policy, based on the assessed risk level,” using “a number of input variables, including **experience data for the specific driver**” (benchmark). USAA-1003, ¶¶236-238; USAA-1005, [0002]-[0004] (identifying different driver types with different risk levels/profiles).

Like Peng, Wilkes “identifies risky driving situations in the context of a driver’s real-time operational environment.” USAA-1518, [0010]. Wilkes further teaches customizing driving analysis for a particular driver. *Id.*, [0041] (adjusting “according to the general accident risk likelihood of each specific driver”). It would have been obvious to a POSITA to implement the Peng-Chatterjee device’s identification of NDEs to account for the specific driving behavior of a driver, or risk likelihood of that driver, as taught by Wilkes, by leveraging Peng’s benchmark that is reflective of how the driver drove his/her vehicle. USAA-1003, ¶¶236-238; *see also* USAA-1024, [0053].

D. [GROUND 1D] – The Combination of Peng and Callopy Renders Claims 6 and 7 Obvious

1. Analysis

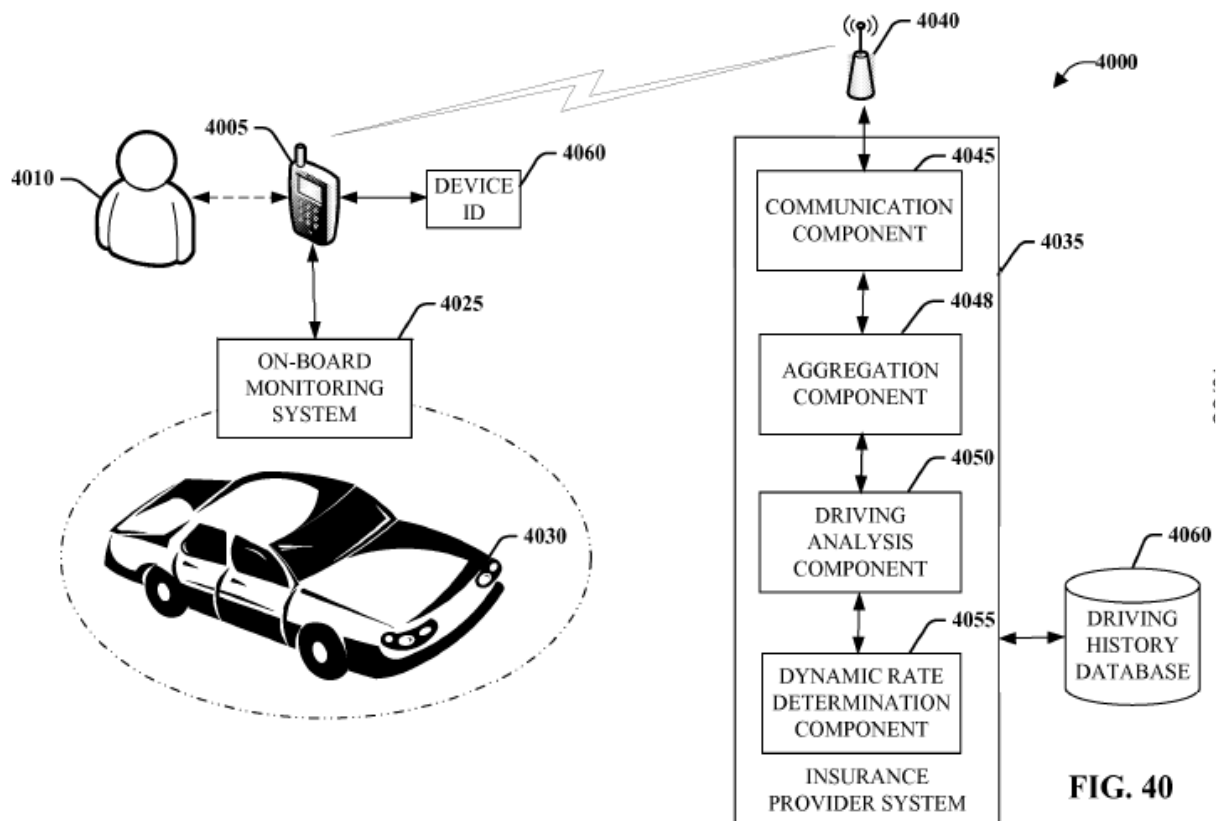
a) Callopy

Callopy teaches providing dynamic insurance rate determinations to a driver based on collected driving data. USAA-1045, Abstract, [0017]-[0018], [0024], [0165], [0314]-[0316], FIGS. 40-42; USAA-1003, ¶124.

Figure 40 shows “a system for real-time monitoring of a driver to facilitate

determination of insurance rates(s).” *Id.*, [0085], [0307]. The system 4000 includes mobile device 4005 (with GPS 4110 and accelerometer 4120), on-board monitoring system 4025, and vehicle 4030, where mobile device 4005 wirelessly communicates with insurance provider system 4035. *Id.*, [0307], [0323]-[0324]; USAA-1003, ¶125.

On-board monitoring system 4025 “monitors and gathers information regarding driver 4010’s driving skills, habits, *etc.* and forwards the information to the insurance provider 4035,” though Callopy suggest that mobile device 4005 can perform the on-board monitoring system’s tasks. *Id.*, [0307], [0321]; USAA-1003, ¶126.



USAA-1045, FIG. 40

Insurance provider 4035 uses “communication component 4045” to communicate with the mobile device 4005. *Id.*, [0307]. To determine insurance rates, it “compile[s] received data to facilitate processing by the data analysis component 4050” and “obtain[s] data from the various components of system 4000,” including mobile device 4005. *Id.*, [0307]-[0308]. The system further includes “database 4060,” included in insurance provider system 4035, to store, e.g., “information retrieved from the mobile device 4005.” *Id.*, [0309]. Insurance provider system 4035 communicates data, including insurance premiums that reflect the driver’s habits, to mobile device 4005. *Id.*, [0308], [0310]. Callopy also teaches a system that allows for the identification and authentication of a driver using a “unique identifier” associated with mobile device 4005 and stored in system 4035’s database. *Id.*, [0332]-[0334], FIG. 42; USAA-1003, ¶¶127-131.

b) Peng-Callopy

Peng’s HMD 10 is configured to “collect[] and evaluat[e] driving behavior data and/or driving environment data, and provid[e] feedback,” including calculating and providing “driving behavior metrics and/or scores.” USAA-1005, Abstract, [0001], [0068], [0021]-[0022], [0019], [0044], [0165]; USAA-1003, ¶¶239-254. After data is collected and processed and “driving behavior metrics and/or

scores” are calculated, the mobile device 10 communicates this data to remote computer(s) 150. USAA-1005, [0068], [0142], [0144]-[0146], FIG. 5.

- i. Database with user accounts and unique identifiers

Peng explains that HMD10 can share “driving behavior metrics and/or scores” with remote computer(s) 150. USAA-1005, [0068], [0142], [0144]-[0146], FIG. 5. A POSITA would have been motivated to improve Peng’s computers 150 to include a database storing accounts including a unique identifier for each account, as Callopy teaches, for multiple reasons. USAA-1003, ¶240; USAA-1045, [0284], [0294], [0307]-[0309], [0323]-[0324], [0332]-[0334], FIG. 42. Specifically, Peng’s system can compare “trips by **different drivers**,” and its “algorithm for calculating the driving score may also account for data other than the metrics, such as the **identity of the driver**.” USAA-1005, [0162], [0155], FIG. 6F. Peng’s NDE identification can be modified for parameters, such as different vehicles. USAA-1005, [0099]-[0125]. A POSITA would have found obvious for Peng’s system to account for different drivers and vehicles. USAA-1003, ¶240. To manage data from more than one driver, it would have been obvious to a POSITA to look to well-known methods of organizing data for multiple drivers/users, such as Callopy. *Id.*

Callopy describes insurance provider system 4035 that includes database 4060 for storing “information regarding driver 4010’s driving skills, habits, *etc.*”

from mobile device 4005 that gathers the information using GPS and accelerometer sensors. USAA-1045, [0307]-[0308], [0323]-[0324], [0284], [0294]. Database 4060 “stores information pertaining to the vehicle operator 4010.” *Id.*, [0308]-[0309]. The driver data is “stored in database 4250” and “driver account information database(s) to identify a driver.” USAA-1045, [0332], [0334], FIG. 42. Specifically, insurance provider system 4035 includes an “identification component 4220” that receives, from the mobile device a “unique identifier (*e.g.*, IMSI number) to identify an individual, associated with mobile device 4005 and driver data stored in database 4250.” *Id.*, [0333]-[0334]; USAA-1003, ¶241.

A POSITA would have found it obvious Peng’s computer(s) 150 to include a database to store data of multiple users/drivers and vehicles, as Peng allows. USAA-1003, ¶240. Such a system would have necessitated a database structure where data for a particular user was associated with that user. To the extent Peng does not explicitly describe a database structure, a POSITA would have obviously included in Peng’s computers 150 a database that stores driving data and unique identifiers for users (*e.g.*, IMSI number associated with the user’s mobile device, as taught by Callopy). USAA-1045, [0333]-[0334]. USAA-1003, ¶241. Similar to Peng, Callopy’s system gathers driving information with a driver’s mobile device. USAA-1005, [0010], [0019]-[0021], [0025], [0029]-[0031], [0034], [0077], FIGS. 1-2; USAA-1045, [0307], [0323]-[0324]. A POSITA would have

naturally looked to Callopy's teaching of using a driver's mobile device to uniquely identify each user's account in the database. USAA-1003, ¶240. In the combination, the computer(s) 150 would have included a database storing user accounts, each account having a unique identifier that associates the user with his/her mobile device and storing the respective user's driving information. *Id.*

Configuring the proposed combination to leverage the Callopy's teachings for including a database for storing user accounts was well within the skill of a POSITA prior to the Critical Date. USAA-1003, ¶¶240-244. Furthermore, the elements of the resulting combination would each generally perform functions they had been known to perform prior to the combination and would also leverage the techniques provided by Callopy to store and organize the driving data of multiple users. USAA-1003, ¶242. Accordingly, a POSITA would have naturally expected success of the proposed combination. *Id.*

ii. Communicating insurance offers

Peng explains that "an insurance company may access driving behavior data collected/processed by HMD 10" for risk analysis and insurance premium determinations. USAA-1005, [0024], [0074], [0143]. Additionally, Peng teaches a user's mobile device communicating with remote computer(s) 150 over communications network 144. USAA-1005, [0144]-[0145], FIG. 5. To the extent that Peng does not explicitly teach that insurance products or premiums are

communicated to the driver's mobile device, it would have been obvious to a POSITA for Peng's remote computer(s) (e.g., at insurance company) to communicate these offers back to the user, as Callopy teaches. USAA-1003, ¶245. Peng's system is already configured for communication to the mobile device. USAA-1005, FIG. 5. Moreover, it was well known to communicate insurance premiums back to a mobile device in similar systems, such as in Callopy. USAA-1003, ¶245; USAA-1045, [0166], [0233], [0310].

Callopy teaches "the insurance rate can dynamically change and the change can be presented [to the driver] through an interface." USAA-1045, [0024]. Similar to Peng's system, Callopy's "insurance provider system 4035" is also connected to a mobile device 4005 over a communication network. *Id.*, [0307], FIG. 40. Specifically, a "dynamic rate determination component 4055" of the "insurance provider system 4035" determines insurance rates based on analyzing collected data and transmits the rates to mobile device "for presentation to the driver." *Id.*, [0310], FIG. 40. Peng and Callopy both teach real-time analysis of data received from its sensors. USAA-1005, [0035]; USAA-1045, [0310]. Peng further teaches providing "real time feedback" to a driver. USAA-1005, [0061]. Thus, it would have been obvious to a POSITA to improve Peng's system by leveraging its existing system and communications to provide to the driver real-time feedback that includes newly-determined insurance premiums (where Peng

already teaches calculating premiums). USAA-1003, ¶246; USAA-1005, [0074].

Configuring the proposed combination to leverage the teachings of Callopy for communicating insurance premiums to a driver was well within the skill of a POSITA prior to the Critical Date. USAA-1003, ¶247.

Furthermore, the elements of the resulting combination would each generally perform functions they had been known to perform prior to the combination and would also leverage the techniques provided by Callopy to receive feedback that includes insurance premiums. USAA-1003, ¶248.

Accordingly, a POSITA would have naturally expected success of the proposed combination. *Id.*

iii. Sensor data captured and processed when device removably attached

Peng explains that data collection can be interrupted if mobile device 10 becomes improperly oriented during its collection process. USAA-1005, [0036]-[0037], [0040]-[0041], [0152]-[0153]; USAA-1003, ¶¶249-254. Despite this, Peng describes positioning the device in a manner, e.g., on a flat surface (*see* FIG. 1), that leave the device vulnerable to orientation changes caused by vehicular movements. USAA-1003, ¶¶249-250.

Thus, it would have been obvious for a POSITA to have improved Peng's system and applied the user interface inputs and sensor detection in Peng's HMD

for the purposes of *preventing* improper orientation of the device from occurring in the first place. USAA-1003, ¶¶249-250; USAA-1005, [0036]-[0037], [0067], [0152]-[0153]. A POSITA would have readily understood that an unsecured phone, e.g., one placed on an open flat surface or in a cup holder, is unstably positioned and therefore vulnerable to changes in orientation, such as sliding, tipping and/or falling, caused by vehicle motion. USAA-1003, ¶¶249-250; USAA-1005, FIGS. 1, 6A.

Hence, a POSITA would have found obvious that Peng's system would be improved by securely attaching the mobile device to a portion of the vehicle where the driver can see the device, as taught by Callopy, to hold the mobile device during vehicle use. USAA-1003, ¶251, ¶¶124-131; USAA-1045, [0154] (describing "a hook and loop fastener" and "a clip that selectively engages with a mating portion associated with the vehicle"). In the combination, Peng's HMD would be releasably attached to the vehicle when in use. *Id.*; *see also* USAA-1045, 159 (claim 129). Since mobile phones were often used in moving vehicles, it would have been obvious to a POSITA that a means for attaching the mobile device to the vehicle could advantageously attach the device in a secure manner and to a convenient location in a vehicle, e.g., vehicle's console or dashboard. USAA-1003, ¶251; USAA-1045, 159 (claim 129); USAA-1502, [0003], [0016], [0006], [0014]; USAA-1006, [0270]; USAA-1516, [0036].

A POSITA would have found obvious that enhancing Peng's system to use an attaching means, as taught by Callopy, while the vehicle is in use to secure the HMD, would introduce multiple advantages, including: (1) increased reliability from securely holding the HMD, (2) increased safety from securely attaching the HMD to the vehicle, (3) increased convenience for a driver to single-handedly operate the device, and (4) reduced noise and error in the collected data and reduced complexity in processing the data by eliminating/minimizing movement associated with the mobile device itself. USAA-1003, ¶¶250-252; *supra* §III.A.1. These, among other advantages, would have motivated a POSITA to combine the teachings of Peng and Callopy in a manner enabling the combination device to collect sensor data while the device is removably attached to a vehicle, as taught by Callopy, while the vehicle is in use. USAA-1003, ¶252; USAA-1005, [0036]-[0037], FIG. 1, 5, 6A; USAA-1045, [0154]. Moreover, Peng and Callopy both teach real-time analysis of data received from its sensors. USAA-1005, [0035]; USAA-1045, [0310]. In the combination, the mobile device would therefore both collect and process sensor data while the mobile device is releasably attached to the vehicle in use because Peng teaches real-time data analysis. USAA-1003, ¶250.

Configuring the proposed combination to leverage the teachings of Callopy and other related art for using and applying a means for attaching a mobile device

to a vehicle was well within the skill of a POSITA prior to the Critical Date.

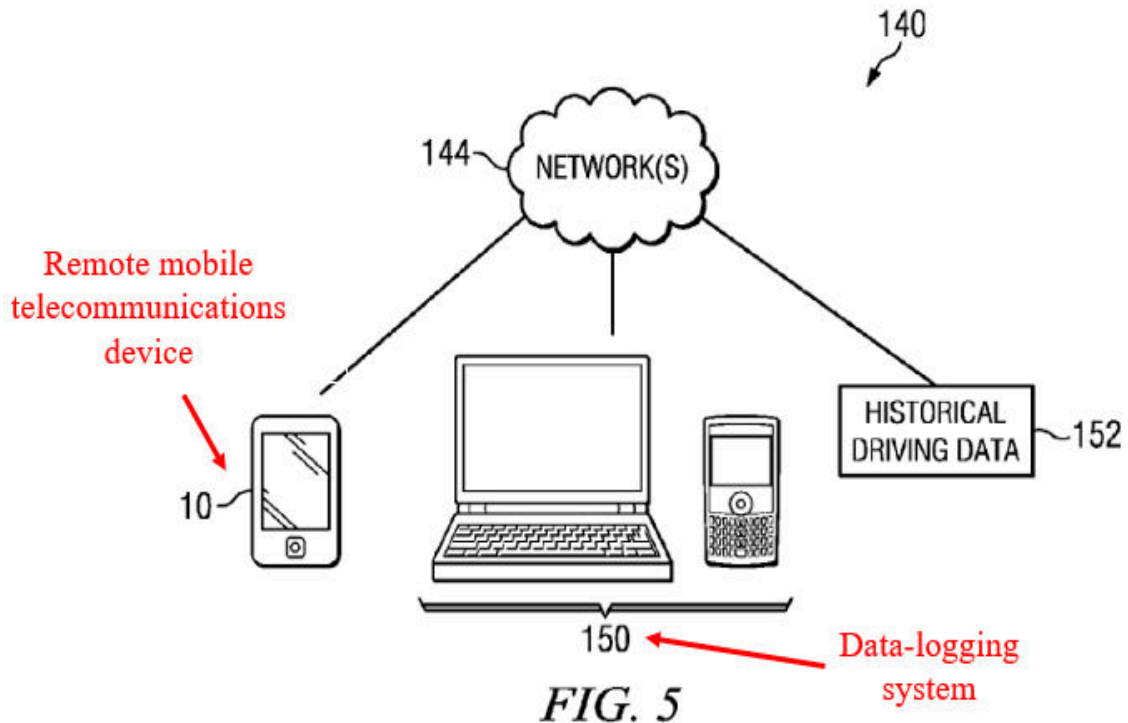
USAA-1003, ¶253.

Furthermore, the elements of the resulting combination would each generally perform functions they had been known to perform prior to the combination and would also leverage the techniques provided by Callopy's disclosure when the docked mobile device performs those functions. USAA-1003, ¶¶249-254. Accordingly, a POSITA would have naturally expected success of the proposed combination. *Id.*

2. Claim 6

[6.1]

Peng-Callopy renders the preamble obvious. USAA-1003, ¶255. Peng discloses a “system 140 for sharing driving data between a [HMD] 10 including driving analysis application 50 and other external systems or devices.” USAA-1005, [0144]. The HMD 10 is communicatively connected to remote computer(s) 150 via network(s) 144. *Id.*; USAA-1003, ¶255.



USAA-1005, FIG. 5 (annotated).

Peng's HMD 10 ("**remote telecommunications device**") "provide[s] one or more features of a driving analysis system, such as (a) **collection of driving data** (e.g., data regarding driving behavior and/or the respective driving environment)." USAA-1005, [0020]. The remote computer(s) 150 ("**data-logging system**") are "operable to receive driving data from [HMD] 10 and further process and/or display such data." USAA-1005, [0068], [0142], [0145]. That is, HMD 10 first logs driving information and then sends the data to computer(s) 150, which logs the received driving information. USAA-1003, ¶256; USAA-1005, [0019]-[0022],

[0032]-[0033], [0035], [0058], [0068], [0142], [0144]-[0149], FIGS. 1-2, 5, 6A-6G.

[6.2]

It would have been obvious to a POSITA that Peng-Callopoy remote computers would necessarily include a processor or a POSITA would have understood it to include one. USAA-1003, ¶257. Peng explains that the remote computer(s) 150 may be configured to perform some or all of the data processing.” USAA-1005, [0146] (“remote processing computer 150”), [0147]. Moreover, Peng clearly teaches that the HMD 10 includes a processor 32. *Id.*, [0006]-[0008], [0025], [0028] FIG. 2. Therefore, it would have be obvious to a POSITA that the “remote computers 150” would also include a processor to perform data processing and other processing operations. USAA-1003, ¶257.

[6.3]

The remote computers 150 include “devices operable to receive driving data from [HMD] 10,” such as a desktop computer or a server. USAA-1005, [0142], [0145]. A POSITA would have therefore understood that the Peng-Callopoy computer(s) 150 would include memory. USAA-1003, ¶258. Peng explains that the remote computer(s) 150 “may be configured to perform some or all of the data processing” discussed in Peng “with respect to a data processing module 42 on [HMD] 10,” and Peng’s HMD 10 includes memory 30 for storing driving data, so

it would have been obvious to a POSITA that computer(s) 150 would also include memory for storing driving data. USAA-1003, ¶258; USAA-1005, [0025]-[0026], [0146]-[0147], FIG. 2.

[6.4]

As discussed (*supra* III.D.1.b.i), Peng-Callopoy renders obvious this element. In particular, Callopoy describes an insurance provider system 4035 with **database** 4060 that receives “information regarding driver 4010’s driving skills, habits, *etc.*” (“**driving information associated with at least one of a vehicle and a driver**”) from mobile device 4005 (with GPS and accelerometer) that collects information. USAA-1003, ¶259; USAA-1045, [0307]-[0308], [0323]-[0324], [0284], [0294]. Callopoy explains that “driver data [is] stored in **database** 4250” of the insurance provider system 4035 and “**driver account information** database(s) to **identify a driver.**” USAA-1045, [0332], [0334], FIG. 42. 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]. Peng’s system discusses the inclusion of multiple drivers. USAA-1005, [0162], [0155], FIG. 6F. Thus, as discussed (*supra* §III.D.1.b.i), a POSITA would have found obvious that Peng-Callopoy’s data logging system includes a database that stores driver account information for multiple

users (“*storing a plurality of accounts*”), and each account having a unique identifier to identify a particular driver. USAA-1003, ¶260.

[6.5]

Peng’s HMD is communicatively connected to remote computer(s) 150 via network(s) 144. USAA-1005, [0144], [0149]. Therefore, a POSITA would have understood that the “remote computers 150 and/or remote data storage systems 152” would necessarily or obviously include an interface for communicating with the mobile device over the network. USAA-1003, ¶261.

A POSITA would have understood that, using its communication interface, the Peng-Callopy logging system receives various data from the mobile device over the network. USAA-1003, ¶262; USAA-1005, [0145] (“operable to receive driving data from [HMD]”), [0148], [0058], [0014], FIG. 5.

[6.6]

As discussed (*supra* §III.D.1.b.i), in Peng-Callopy, “[t]o enable the correlation of a unique identifier” to a driver, “user identification information can be retrieved from the mobile device 4005 and forwarded” to insurance provider system 4035. USAA-1045, [0333]. The user identification information (“*unique identifier*”) can comprise, e.g., an IMSI number retrieved from mobile device. *Id.* The insurance provider system 4035 “can access storage device 4250, 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.*; USAA-1003, ¶263.

[6.7]

As discussed (*supra* §III.D.1.b.i, [6.4]), the driving information in the Peng-Callopoy combination is logged to the corresponding account for the specific driver. USAA-1003, ¶264. In Peng-Callopoy, when “starting [] data recording (i.e., starting a data collection session), a screen or image for starting data recording may appear upon the [HMD] 10 being properly oriented.” USAA-1005, [0152]. Using this screen, the mobile device receives user inputs as “manual instruction” (“***inputs received by a user interface***”), e.g., “a user pressing a ‘Start Recording’ button that is displayed” on HMD 10 can “start (or re-start) collection of driving data.” *Id.*, [0152], [0066], [0154]. The Peng-Callopoy mobile device includes sensors that “collect one or more types of data regarding driving behavior and/or the driving environment,” including a GPS device and accelerometer. *Id.*, [0020]-[0021]. Based on inputs received by a user interface (e.g., input to start recording) and on sensor data (e.g., acceleration) from the sensors set (e.g., “a built-in accelerometer”) that are recorded responsive to the instruction to start recording, the Peng-Callopoy mobile device derives “data regarding driving behavior and/or the driving environment.” USAA-1003, ¶¶264-265; USAA-1005, [0021]-[0022], [0029],

[0064], [0069], [0039], [0165], FIG. 4.

As shown in Peng's FIG. 4, the Peng-Callopy mobile device "calculate[s] driving behavior metrics" used to generate "driving scores." USAA-1003, ¶¶264-267; USAA-1005, [0074], [0044], FIG. 4.

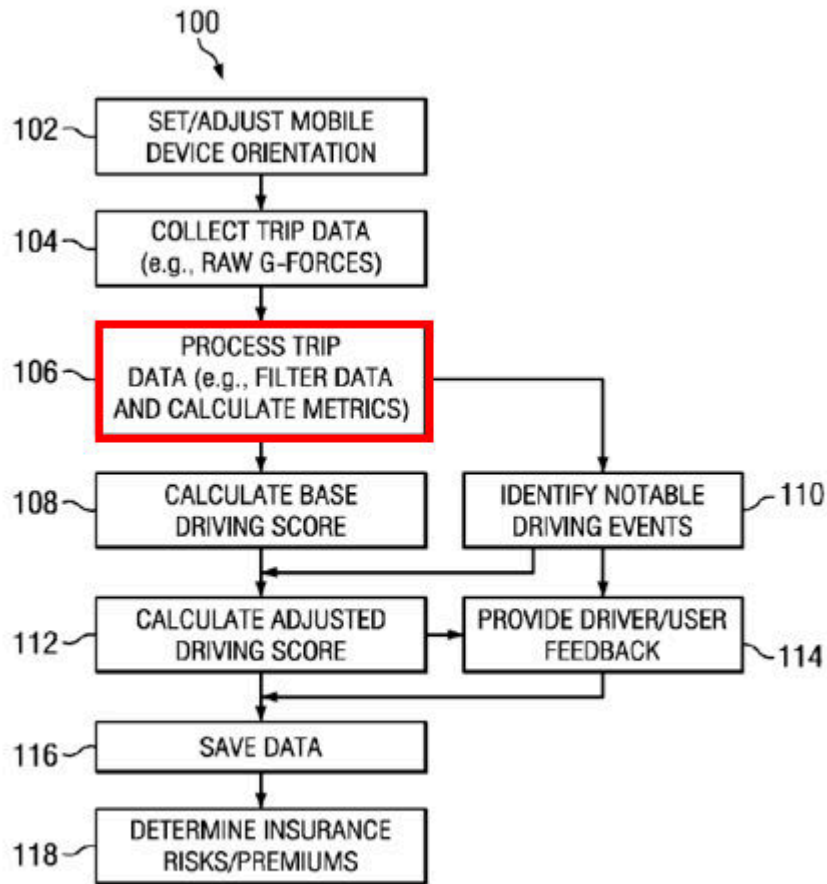


FIG. 4

USAA-1005, FIG. 4 (annotated)

[6.8]

As discussed (*supra* [6.7], [4.9]), it would have been obvious to configure Peng-Callopy's system to receive driving information derived based on inputs

received by a user interface of the remote mobile telecommunications device and sensor data from a sensor set of the remote mobile telecommunications device, including sensor data from the sensor set to derive “driving behavior metrics and/or scores.” USAA-1003, ¶¶268-271; USAA-1005, [0022], [0064], [0165].

The Peng-Callopy mobile device would have been obviously configured to “collect [driving behavior] data from sources, including (a) data sources provided by [HMD] 10...(b) data sources in vehicle 12 but external to [HMD] 10...and/or (c) data sources external to vehicle 12.” USAA-1005, [0033], [0034], [0029]; USAA-1003, ¶¶269-271.

In one example, a POSITA would have obviously configured the Peng-Callopy device to use “real time analysis of data received from accelerometer 54, location tracking system 56, or other sensors 34 provided by [HMD]....” USAA-1005, [0035]; USAA-1003, ¶¶270-271. A POSITA would have found obvious that, based on Peng’s teachings, the combination device derives driving information without data from the vehicle sensors, at least because Peng offers examples that focus only on leveraging motion data obtained from one or more sensors provided by the mobile phone (e.g., sensors 34) to derive filtered data and/or driving behavior metrics (“*driving information*”). USAA-1003, ¶¶268-272; USAA-1005, [0044], [0035].

Further, from Peng’s teaching, a POSITA would have understood that data

from vehicle sensors is not needed 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 involved in obtaining and integrating data from a vehicle's sensors. USAA-1003, ¶273; USAA-1026, 11:15-25.

[6.9]

As explained above, Peng-Callopoy renders obvious computer(s) 150 receiving “data regarding driving behavior and/or the driving environment” (“*driving information*”) from a remote mobile device. USAA-1003, ¶¶274-275; USAA-1005, [0021]-[0022], [0029], [0039], [0064], [0069], [0165], FIG. 4. Peng-Callopoy further renders obvious the types of driving data that the mobile device derives. *Id.* Peng explains that the mobile device processes collected driving data to “calculate one or more driving behavior metrics and/or scores based on such collected driving data” (“*driving score*”). *Id.*, [0022], [0044]-[0045], FIG. 4; USAA-1003, ¶¶274-275.

Peng-Callopoy also teaches sensor data captured and processed by the remote device during a driving period during which the mobile device is removably attached to the vehicle being driven by the driver, as discussed above in §III.D.1.b.iii. USAA-1003, ¶275. The Peng-Callopoy device starts “collection of

driving data in response to determining that the [HMD] 10 is likely travelling in an automobile, e.g., **based on a real time analysis of data received from accelerometer 54, location tracking system 56, or other sensors 34** provided by [HMD]” (“*sensor data captured and processed*”). USAA-1003, ¶276; USAA-1005, [0035], [0077], [0029]. Peng additionally teaches data is analyzed and processed in real-time as it is collected. USAA-1005, [0035], [0038], [0073], FIG. 3, USAA-1003, ¶274. It would have been obvious that Peng-Callopy “gather[s] ...real-time operation information of the vehicle” (“*sensor data captured*”) and “is removably attached to the vehicle and receives input from an operator of the vehicle” (“*during a driving period during which the mobile device is removably attached to the vehicle being driven by the driver*”) as Callopy teaches. USAA-1005, [0037], [0151]; USAA-1045, [0154], [0388], claims 121, 123, 129; USAA-1003, ¶276.

It would have been obvious to a POSITA for the Peng-Callopy device to capture and process sensor data during a driving period during which the HMD 10 is removably attached to the vehicle and the vehicle is moving (or otherwise in use) for multiple reasons, e.g., minimizing driving data collection interruptions and securely attaching the device 10 within the vehicle in a safe and convenient manner, as discussed above in §III.D.1.b.iii. USAA-1003, ¶277; USAA-1005, [0001], [0014], [0019], [0021]-[0022], [0029], [0036]-[0037], [0040], [0067], [0076]-

[0077], [0151], [0153], [0165], FIGS. 1, 4-6A; USAA-1045, [0154].

Peng further explains that a user at the remote computer(s) 150 may request data, such as a score, from the mobile device. USAA-1005, [0068]. A POSITA would have found it obvious for the mobile device to transmit the score and/or sensor data, along with other driving information, to the remote computer(s) for the purpose of calculating insurance premiums and the like based on the scores and sensor data. USAA-1003, ¶278; USAA-1005, [0074]; *see also* USAA-1026, 7:5-22, 10:2-12.

[6.10]

Peng-Callopy's "computers 150 may be configured to perform some or all of the data processing discussed above with respect to data processing module 42 on [HMD] 10," where the data processing by the data processing module 42 includes "process[ing] or analyz[ing] any of the driving data ... collected by [HMD] 10" and "calculat[ing] one or more driving behavior metrics and/or scores." USAA-1005, [0044], [0069], [0089]-[0098], [0145]-[0146]. Thus, a POSITA would have found obvious that Peng-Callopy's data logging system is arranged to process the driving information to generate a driving score. USAA-1003, ¶¶279-280.

A POSITA would have found it obvious that the driving score generated by Peng-Callopy's data logging system is used to determine a risk profile for at least one of the vehicle and driver. USAA-1003, ¶¶280-281. Peng's driving score is

used “for performing risk analysis of the respective driver,” and “[t]he insurance provider may determine appropriate insurance products or premiums for the driver according to such risk analysis.” USAA-1005, [0074], [0143]. A POSITA would have understood that an insurance premium for a particular driver and a driving score are both reflective of that driver’s risk profile. USAA-1003, ¶¶280-281; USAA-1005, [0004], [0024], [0074], [0143]; USAA-1045, [0004]; *see also* USAA-1026, 16:7-22. Indeed, a POSITA would have recognized that the ’271 Patent’s discussion of a “risk profile” is similar to Peng’s description of a driving score, so a POSITA would have understood that Peng’s insurance premium and/or score is a risk profile for the driver or that a risk profile would have been obvious in light of Peng’s insurance premium and/or score. USAA-1003, ¶281; *compare* USAA-1001, 22:13-15, *with* USAA-1005, [0022], [0053]-[0055], [0074], [0133]-[0138], [0143], [0165], FIG. 4.

3. Claim 7

[7.1]-[7.10]

Peng-Callopy renders obvious claim elements [7.1]-[7.10] for at least the reasons discussed above with respect to the claim elements [6.1]-[6.10] applied in Ground 1D. Peng-Callopy additionally renders obvious claim element [7.11] for at least the reasons discussed below. USAA-1003, ¶¶282-291.

[7.11]

As discussed (*supra* [6.10]), Peng-Callopy renders obvious wherein the

driving score is used to define an insurance premium associated with the account.

USAA-1003, ¶292. Peng-Callopoy further renders obvious that the data-logging system is arranged to communicate to the remote mobile telecommunication device an insurance offer generated in response to the driving information received from the remote device. *Id.* The Peng-Callopoy data-logging system communicates insurance offers, including “insurance rates” and “changes to an insurance premium and/or coverage” to a remote device. USAA-1005, [0024], [0074], [0141], [0143], [0165] (“provide a potential customer a quote for insurance”); USAA-1045, [0166], [0233], [0310]. A “dynamic rate determination component 4055” in the data logging system “dynamically determine[s] an insurance rate(s) based upon the gathered data and data analysis,” and the “determined insurance rate(s) and any other pertinent information can be transmitted to the mobile device 4005 ... for presentation to the driver.” *Id.*, [0310]; USAA-1003, ¶293.

IV. PTAB DISCRETION SHOULD NOT PRECLUDE INSTITUTION

A. Discretion Under §314

Consistent with Congressional intent, the goals of *Fintiv*, and Director Vidal’s June 2022 interim guidance, USAA asks the Board to consider the challenges raised in this Petition. IPR2020-00019, Pap. 11, 6 (PTAB Mar. 20, 2020)

(precedential)(“*Fintiv*”). First, a holistic analysis of the *Fintiv* framework favors institution.¹⁰

Even were that not the case, the Petition presents compelling challenges and, for at least that additional reason, “the PTAB should not discretionarily deny institution under *Fintiv*.” USAA-1065, 3-5; IPR2022-01242 Pap. 23 at 3, 5-6 (Feb. 27, 2023) (precedential) (“*Commscope*”).

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

Factor 2 (proximity of trial date to FWD) favors institution. USAA has been diligent. PO filed its complaint on 5/11/2022, and this Petition has been prepared concurrent with eight other petitions challenging related patents, each filed

¹⁰ Apart from Petitioner’s showing that the *Fintiv* factors favor institution, the *Fintiv* framework should not be followed because the framework (1) exceeds the Director’s authority, (2) is arbitrary and capricious, and (3) was adopted without notice-and-comment rulemaking.

before the statutory bar date. IPR2020-00156, Paper 10, 9 & n.8 (June 15, 2020)

(“*Seven*”); USAA-1004.

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

Indeed, applying the District’s median time-to-trial of about 29.5 months (USAA-1067, 37) to the complaint filing date suggests a jury trial in late October 2024. Based on the 18-month IPR schedule, the Board would be expected to issue its Final Written Decision (“FWD”) in November 2024 (i.e., around the same time as the median-expected trial). USAA-1065, 9.

Factor 3 (investment in parallel proceedings) favors institution. This Petition is being filed at an early stage of the litigation, which “has weighed against exercising the authority to deny institution....” *Seven*, 11-13 (quoting *Fintiv*, 11).

Factor 4 (overlap in issues) favors institution because the Petition’s Grounds are materially different from any that might be raised in litigation. PO presently alleges infringement of the ’271 Patent’s claims 1 and 3-7, but its contentions are preliminary; PO has not committed to limiting its assertion as such. USAA-1075, 6. Lacking an indication from PO of the full complement of claims for which infringement will ultimately be alleged by PO in this or future litigation,

USAA challenges all claims of the '271 Patent. Accordingly, only this proceeding addresses the patentability of a material number of the Challenged Claims. *Seven*, 21.

Furthermore, to eliminate any doubt as to the absence of meaningful overlap between the Litigation and IPR, USAA stipulates that upon institution of this Petition, USAA will not seek resolution in the District Court of any ground of invalidity using any of Peng, Chatterjee, Tamir, Wilkes, or Callopy. USAA-1074. By this stipulation, Factor 4 weighs heavily against denial of institution because, upon institution, there would be *zero overlap* between the prior art in this IPR and the prior art in District Court. *See* IPR2021-00972 Pap. 10, 13-16 (Dec. 8, 2021)(“*AliveCor*”); IPR2021-00033, Pap. 13, 14 (April 30, 2021).

Factor 5 (overlap in parties) is, at worst, neutral. The Litigation involves the same parties. IPR2020-00122, Pap. 15, 10 (Crumbley, dissenting); *Fintiv*, 13-14; *Snap*, 16.

Factor 6 (other circumstances) compels institution. “[T]he PTAB will not deny institution...under *Fintiv*...when a petition presents compelling evidence of unpatentability....” USAA-1065 (*Director’s Guidance*), 3-5, 9; *Fintiv*, 14-15.

This Petition’s merits are compelling. Institution would result in a finding of unpatentability, and the strength of the merits alone is enough to outweigh any inefficiencies born of parallel litigation. USAA-1065, 3-5, 9; *Fintiv*, 14-15.

Further, institution would *promote* the AIA's objectives. Sen. Rep. No. 110-259 (2008); H.R. Rep. No. 112-98, pt. 1, 39-40; *Snap*, 16-19; *Commscope*, 4.

B. Discretion Under §325(d)

The asserted references were not considered during prosecution. *See, generally*, USAA-1002. The Challenged Claims have not previously been challenged in an IPR or PGR proceeding. While the '271 Patent lists U.S. Pub. No. 2010/0131307 ("Collopy," USAA-1517), it was not relied upon for any rejection. USAA-1001, 2; *see, generally*, USAA-1002. Moreover, while related, Callopy is not cumulative of Collopy. *Compare* USAA-1045, *with* USAA-1517; USAA-1003, ¶67. Callopy has a significantly longer disclosure, including approximately 300 paragraphs and 46 figures not disclosed in Collopy. USAA-1003, ¶67 (Appendix B). Moreover, the invalidity grounds rely primarily on portions of Callopy (e.g., Figures 40-42 and related descriptions in [0306]-[0357]) that were not in Collopy. *Id.*; *see supra* §III.D.

The examiner's plain errors in failing to cite or apply those references cited herein are highlighted by the element-by-element analysis set forth herein and by the Michalson declaration (USAA-1003). *See supra* Grounds 1A-1D. Indeed, nothing in the prosecution record applies or analyzes any of the references in a manner cumulative to the analysis in the present petition. Thus, the *Becton, Dickinson* factors weigh against exercising §325(d) discretion. *See* IPR2017-01586,

Paper 8, 17-28 (Dec. 15, 2017).

Accordingly, the Board should reach the merits of this Petition and institute review of the Challenged Claims.

V. CONCLUSION AND FEES

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

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

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

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

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

The ’271 Patent is the subject of a civil action, *Auto Telematics Ltd. v. United Services Automobile Association*, 6:22-cv-00474-ADA-DTG, W.D. Tex., filed May 11, 2022. USAA-1004. USAA is concurrently filing a second petition challenging claims of the ’271 Patent (IPR2023-00911). USAA is not aware of any other disclaimers, reexamination certificates, or IPR petitions addressing the ’271 Patent.

USAA has also previously filed eight IPR petitions challenging patents related to the ’271 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), and U.S. Pat. No. 10,918,879 (IPR2023-00857,

IPR2023-00858, IPR2023-00859).

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

USAA provides the following designation of counsel.

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D. Service Information

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

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Respectfully submitted,

Dated May 11, 2023

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CERTIFICATION UNDER 37 CFR § 42.24

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Petition for *Inter Partes* Review totals 13,897 words, which is less than the 14,000 allowed under 37 CFR § 42.24.

Dated May 11, 2023

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR §§ 42.6(e)(4)(i) *et seq.* and 42.105(b), the undersigned certifies that on May 11, 2023, a complete and entire copy of this Petition for *Inter Partes* Review and all supporting exhibits were provided by Federal Express, to the Patent Owner, by serving the correspondence address of record as follows:

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