

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent of: Andrew William Wright  
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Title: METHOD AND SYSTEM FOR LOGGING VEHICLE  
BEHAVIOUR

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**PETITION FOR *INTER PARTES* REVIEW OF**  
**UNITED STATES PATENT NO. 10,198,879**

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**EXHIBITS**

|           |                                                                                                                                                                                                        |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| USAA-1001 | U.S. Patent No. 10,198,879 to Wright (“the ‘879 Patent”)                                                                                                                                               |
| USAA-1002 | Excerpts from the Prosecution History of the ‘879 Patent (“the Prosecution History”)                                                                                                                   |
| USAA-1003 | Declaration and Curriculum Vitae of Dr. William Michalson                                                                                                                                              |
| USAA-1004 | Original Complaint for Patent Infringement in <i>Auto Telematics Ltd. v. United Services Automobile Association</i> , 6:22-cv-00474 (W.D. Tex. May 11, 2022)                                           |
| USAA-1005 | International Publication No. WO 2010/042545 to Curry et. al (“Curry”)                                                                                                                                 |
| USAA-1006 | U.S. Patent No. 7,821,421 to Tamir et. al (“Tamir”)                                                                                                                                                    |
| USAA-1007 | U.S. Patent No. 6,073,004 to Balachandran (“Balachandran”)                                                                                                                                             |
| USAA-1008 | Thompson et. al, “Using Smartphones 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 (“Cheng”) |
| USAA-1012 | U.S. Pat. No. 8,290,480 to Abramson (“Abramson”)                                                                                                                                                       |
| USAA-1013 | U.S. Pat. No. 8,682,399 to Rabu (“Rabu”)                                                                                                                                                               |

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| USAA-1014 | U.S. Pat. App. Pub. No. 2010/0208070 to Haynes (“Haynes”)                                                                                                                               |
| USAA-1015 | U.S. Pat. App. Pub. No. 2002/0105423 to Rast (“Rast”)                                                                                                                                   |
| USAA-1016 | U.S. Pat. App. Pub. No. 2009/0192705 to Golding (“Golding”)                                                                                                                             |
| USAA-1017 | U.S. Pat. No. 7,765,058 to Doering (“Doering”)                                                                                                                                          |
| USAA-1018 | European Pat. Pub. No. EP1614585A1 to Christian (“Christian”)                                                                                                                           |
| USAA-1019 | U.S. Pat. No. 5,906,393 to Mazur (“Mazur”)                                                                                                                                              |
| USAA-1020 | Richard C. Hunt, “Emerging Communication Technologies in Emergency Medical Services,” Prehospital Emergency Care, 2002; 6:1, 131-136 (“Hunt”)                                           |
| USAA-1021 | Kanianthra, Joseph, et al. “Enhancing post-crash vehicle safety through an automatic collision notification system” No. 2001-06-0085, SAE Technical Paper, 2001 (“Kanianthra”)          |
| USAA-1022 | Megalingam R.K. et al., “Wireless vehicular accident detection and reporting system”, 2010 International Conference on Mechanical and Electrical Technology (ICMET 2010) (“Megalingam”) |
| USAA-1023 | Farris, P. et al., “General Motors OnStar”, Darden Case No. UVA-M-0659 (2003) (“Farris”)                                                                                                |
| USAA-1024 | European Pat. App. Pub. No. EP 1,914,691 to Katayama et al. (“Katayama”)                                                                                                                |
| USAA-1025 | U.S. Pat. App. Pub. No. 2012/0074770 to Lee (“Lee”)                                                                                                                                     |
| USAA-1026 | RESERVED                                                                                                                                                                                |
| USAA-1027 | Linda Null and Julia Lobur, Excerpts from The Essentials of Computer Organization and Architecture (2d ed. 2003) (“Null”)                                                               |

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| USAA-1028 | U.S. Pat. Publication No. 2009/0005975 to Forstall et al.<br>("Forstall")                                                                                                                                       |
| USAA-1029 | Langle et al., "Are you a safe driver?" 2009 International<br>Conference on Computational Science and Engineering. Vol. 2.<br>IEEE, 2009 ("Langle")                                                             |
| USAA-1030 | U.S. Pat. Publication No. 2006/0053038 to Warren et al.<br>("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<br>traffic conditions using mobile smartphones," Proceedings of<br>the 6th ACM conference on Embedded network sensor systems,<br>2008 ("Mohan") |
| USAA-1033 | U.S. Pat. No. 5,274,560 to LaRue ("LaRue")                                                                                                                                                                      |
| USAA-1034 | Declaration of Nathaniel E. Frank-White re Exhibits USAA-<br>1077 (Ex. A) and USAA-1078 (Ex. B)                                                                                                                 |
| USAA-1035 | RESERVED                                                                                                                                                                                                        |
| USAA-1036 | Declaration of Nathaniel E. Frank-White re Exhibits USAA-<br>1079 (Ex. A), USAA-1080 (Ex. B), and USAA-1081 (Ex. C)                                                                                             |
| USAA-1037 | U.S. Pat. Publication No. 2012/0014659 to Hugosson<br>("Hugosson")                                                                                                                                              |
| USAA-1038 | U.S. Pat. Publication No. 2011/0225284 to Savolainen<br>("Savolainen")                                                                                                                                          |
| USAA-1039 | U.S. Pat. Publication No. 2010/0174449 to Kim ("Kim")                                                                                                                                                           |
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- USAA-1043 Wakiyara, Masataka, “Recent developments in lithium ion batteries,” Materials Science and Engineering: R: Reports 33.4 (2001): 109-134 (“Wakiyara”)
- USAA-1044 Toledo, Tomer, et. al, “In-vehicle data recorders for monitoring and feedback on drivers’ behavior,” Transportation Research Part C: Emerging Technologies 16.3 (2008): 320-331 (“Toledo”)
- USAA-1045 International Publication No. WO 2010/062899 (“Callopy”)
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- USAA-1047 Conover, Gerald D. “ITS Technology in Automotive—Who's on First?” SAE International (2006): 1-11 (“Conover2006”)
- USAA-1048 Skog, Isaac, et al., “A versatile PC-based platform for inertial navigation,” Proceedings of the 7th Nordic Signal Processing Symposium-NORSIG 2006. IEEE, 2006 (“Skog2006”)
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- USAA-1055 Schott, Christian, et al., “CMOS single-chip electronic compass with microcontroller,” IEEE Journal of Solid-State Circuits 42.12 (2007): 2923-2933 (“Schott2007”)
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- USAA-1065 Memorandum, Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation (USPTO June 21, 2022) (“Director’s Guidance”)
- USAA-1066 Order Granting Motion for Entry of Scheduling Order in *Auto Telematics Ltd. v. United Services Automobile Association*, 6:22-cv-00474 (W.D. Tex. September 16, 2022)
- USAA-1067 U.S. District Court Statistics (Dec. 31, 2022), *available at* [https://www.uscourts.gov/sites/default/files/data\\_tables/fcms\\_na\\_distprofile1231.2022.pdf](https://www.uscourts.gov/sites/default/files/data_tables/fcms_na_distprofile1231.2022.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 *Auto Telematics Ltd. v. United Services Automobile Association*, 6:22-cv-00474 (W.D. Tex. January 25, 2023)
- USAA-1071 Plaintiff's Claim Construction Sur-Reply Brief in *Auto Telematics Ltd. v. United Services Automobile Association*, 6:22-cv-00474 (W.D. Tex. February 6, 2023)
- USAA-1072 Joint Claim Construction Statement in *Auto Telematics Ltd. v. United Services Automobile Association*, 6:22-cv-00474 (W.D. Tex. February 7, 2023)
- USAA-1073 Claim Construction Order in *Auto Telematics Ltd. v. United Services Automobile Association*, 6:22-cv-00474 (W.D. Tex. February 17, 2023)
- USAA-1074 Stipulation by USAA
- USAA-1075 Plaintiff Auto Telematics Ltd.'s Preliminary Infringement Contentions and Identification of Document Production Accompanying Disclosure in *Auto Telematics Ltd. v. United Services Automobile Association*, 6:22-cv-00474 (W.D. Tex. August 26, 2022)
- USAA-1076 United Services Automobile Association's Preliminary Invalidity Contentions in *Auto Telematics Ltd. v. United Services Automobile Association*, 6:22-cv-00474 (W.D. Tex. October 21, 2022)
- USAA-1077 Internet Archive of Waze User Manual
- USAA-1078 Internet Archive of iPhone User Guide

|           |                                                                |
|-----------|----------------------------------------------------------------|
| USAA-1079 | Internet Archive of iPhone 3G Technical Specification          |
| USAA-1080 | Internet Archive of iPhone User Guide for iPhone and iPhone 3G |
| USAA-1081 | Internet Archive of Instruction Sheet for iPhone 3G            |

**LISTING OF CHALLENGED CLAIMS**

| <b>Claim</b> | <b>Identifier</b> | <b>Claim Language</b>                                                                                                                                                                                                                                                                                            |
|--------------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1            | [1.1]             | A mobile telecommunications device configured to log driving information associated with a vehicle, the mobile telecommunications device comprising:                                                                                                                                                             |
|              | [1.2]             | a sensor set comprising an image sensor, an audio sensor, an accelerometer or a positioning module, or a combination thereof;                                                                                                                                                                                    |
|              | [1.3]             | a user interface;                                                                                                                                                                                                                                                                                                |
|              | [1.4]             | a processor; and                                                                                                                                                                                                                                                                                                 |
|              | [1.5]             | a memory;                                                                                                                                                                                                                                                                                                        |
|              | [1.6]             | the mobile telecommunications device being configured to: determine, based on at least one of the inputs received by the user interface and sensor data from the device's sensor set, a start of a driving period during which the mobile device is removably attached to the vehicle and the vehicle is in use; |
|              | [1.7]             | process the sensor data from the sensor set during the driving period to derive driving information associated with how the vehicle is driven; and                                                                                                                                                               |
|              | [1.8]             | store a selection of the driving information to the memory;                                                                                                                                                                                                                                                      |
|              | [1.9]             | wherein the driving information is derived without data from the vehicle sensors, and                                                                                                                                                                                                                            |
|              | [1.10]            | the mobile telecommunications device is controlled by a downloaded application to control the mobile device to process the driving information to generate a driving score associated with a particular driver.                                                                                                  |
| 2            | [2]               | A mobile telecommunications device according to claim 1, wherein the mobile telecommunications device is controlled by the downloaded application to control the mobile device to detect occurrence of a predetermined event and in response take at least one predetermined action.                             |

| Claim | Identifier | Claim Language                                                                                                                                                                                                              |
|-------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3     | [3]        | A mobile telecommunication device according to claim 2, wherein predetermined action is storing driving information associated with that event to the memory.                                                               |
| 4     | [4]        | A mobile telecommunication device according to claim 2, wherein predetermined action is storing driving information captured at a higher sampling rate than when an event is not detected.                                  |
| 5     | [5]        | A mobile telecommunication device according to claim 2, wherein predetermined action is transmitting driving information via a wireless telecommunication module of the mobile telecommunication device to a remote system. |
| 6     | [6.1]      | A mobile telecommunications device according to claim 2, wherein the predetermined action comprises providing feedback to a user to indicate that an event has been detected,                                               |
|       | [6.2]      | the mobile telecommunications device being configured to receive a user interaction to confirm or deny whether the detected event has actually occurred following said feedback.                                            |
| 7     | [7.1]      | A mobile telecommunications device according to claim 6, wherein the feedback comprises notifying a user that a further action has been scheduled, and will be taken within a predetermined period,                         |
|       | [7.2]      | the mobile telecommunications device being further configured to receive a user interaction to confirm or deny whether the further scheduled action should be taken within a predetermined period.                          |
| 8     | [8.1]      | A mobile telecommunications device according to claim 2, wherein the predetermined action comprises communicating to a remote system that an event has been detected,                                                       |
|       | [8.2]      | the mobile telecommunications device being further configured to receive from the remote system a request to transmit to the remote system selected portions of the                                                         |

| Claim | Identifier | Claim Language                                                                                                                                                                                                                      |
|-------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |            | driving information associated with the detected event.                                                                                                                                                                             |
| 9     | [9.1]      | A mobile telecommunications device according to claim 2, wherein the memory comprises: a long term memory for persistently storing driving information and a short term memory for transiently storing driving information,         |
|       | [9.2]      | wherein the short term memory receives driving information at a higher update rate than the long term memory,                                                                                                                       |
|       | [9.3]      | the mobile telecommunications device being further configured to: write driving information to the short term memory at a predetermined update rate during the driving period in a predetermined sequence; and,                     |
|       | [9.4]      | overwrite the driving information previously written to the short term memory in accordance with the predetermined sequence.                                                                                                        |
| 10    | [10.1]     | A mobile telecommunications device according to claim 9, wherein the mobile telecommunications device is controlled by the downloaded application to control the mobile device to detect an occurrence of a predetermined event and |
|       | [10.2]     | in response transfer data from the short term memory to the long term memory.                                                                                                                                                       |
| 11    | [11]       | A mobile telecommunications device according to claim 2, wherein the device is controlled by the downloaded application to manage voice-calls incoming to the mobile telecommunications device during a driving period.             |
| 12    | [12]       | A mobile telecommunications device according to claim 2, wherein the device is controlled by the downloaded application to enable a hands-free mode of operation on detection of the driving period.                                |
| 13    | [13]       | A mobile telecommunications device according to claim 12, wherein the hands-free mode of operation comprises enabling voice-activated commands on the mobile                                                                        |

| Claim | Identifier | Claim Language                                                                                                                                                                                                                                                                                                                    |
|-------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |            | device.                                                                                                                                                                                                                                                                                                                           |
| 14    | [14.1]     | A mobile telecommunications device according to claim 2, wherein the device is controlled by the downloaded application to detect the occurrence of a predetermined event of significance, such as a crash, and                                                                                                                   |
|       | [14.2]     | in response to store driving information associated with that event to the memory.                                                                                                                                                                                                                                                |
| 15    | [15.1]     | A mobile telecommunications device according to claim 2, wherein the device is controlled by the downloaded application to detect the occurrence of a predetermined event of significance, such as a crash, and                                                                                                                   |
|       | [15.2]     | in response to transmit driving information associated with that event via the wireless telecommunication module to a remote data-logging system.                                                                                                                                                                                 |
| 16    | [16]       | A mobile telecommunications device according to claim 2, wherein the at least one predetermined action comprises providing the user with options to control the mobile device to take further actions.                                                                                                                            |
| 17    | [17]       | A mobile telecommunications device according to claim 1, further configured to: interface with an external device, the external device having access to external driving information associated with a condition of the vehicle; and, to receive at least a portion of the external driving information from the external device. |
| 18    | [18]       | A mobile telecommunications device according to claim 17, further arranged to interface with the external device wirelessly.                                                                                                                                                                                                      |
| 19    | [19]       | A mobile telecommunications device according to claim 1, wherein the mobile telecommunications device utilizes its own power supply.                                                                                                                                                                                              |
| 20    | [20]       | A mobile telecommunications device according to claim 1, wherein the mobile telecommunications device is a smartphone.                                                                                                                                                                                                            |
| 21    | [21.1]     | A non-transitory computer readable medium having                                                                                                                                                                                                                                                                                  |

| Claim | Identifier | Claim Language                                                                                                                                                                                                                                                                                                                             |
|-------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |            | instructions comprising a software application stored thereon, wherein the instructions are configured to be executed on a processor of a mobile telecommunications device to enable the mobile telecommunications device to log driving information associated with a driver of a vehicle, the mobile telecommunications device including |
|       | [21.2a]    | a display;                                                                                                                                                                                                                                                                                                                                 |
|       | [21.3]     | a sensor set comprising an image sensor, an audio sensor, an accelerometer or a positioning module, or a combination thereof;                                                                                                                                                                                                              |
|       | [21.4]     | the processor; and                                                                                                                                                                                                                                                                                                                         |
|       | [21.5]     | a memory,<br><br>wherein the instructions, upon execution by the processor, enable the mobile telecommunications device to:                                                                                                                                                                                                                |
|       | [21.2b]    | present a user interface on the display;                                                                                                                                                                                                                                                                                                   |
|       | [21.6]     | determine, based on at least one of the inputs received by the user interface and/or sensor data from the sensor set, a start of a driving period during which the mobile telecommunications device is removably attached to a vehicle and the vehicle is being driven by the driver;                                                      |
|       | [21.7]     | process the sensor data from the sensor set during the driving period to derive driving information associated with how the vehicle is driven;                                                                                                                                                                                             |
|       | [21.8]     | store a selection of the driving information to the memory; and                                                                                                                                                                                                                                                                            |
|       | [21.9]     | generate a driving score associated with the driver,                                                                                                                                                                                                                                                                                       |
|       | [21.10]    | wherein the driving information is derived without data from vehicle sensors.                                                                                                                                                                                                                                                              |
| 22    | [22]       | A non-transitory computer readable medium according to claim 21, wherein execution of the instructions further enables the mobile telecommunications device to                                                                                                                                                                             |

| Claim | Identifier | Claim Language                                                                                                                                                                                                                       |
|-------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |            | detect occurrence of a predetermined event and in response take at least one predetermined action.                                                                                                                                   |
| 23    | [23]       | A non-transitory computer readable medium according to claim 22, wherein predetermined action is storing driving information associated with that event to the memory.                                                               |
| 24    | [24]       | A non-transitory computer readable medium according to claim 22, wherein predetermined action is storing driving information captured at a higher sampling rate than when an event is not detected.                                  |
| 25    | [25]       | A non-transitory computer readable medium according to claim 22, wherein predetermined action is transmitting driving information via a wireless telecommunication module of the mobile telecommunication device to a remote system. |
| 26    | [26.1]     | A non-transitory computer readable medium according to claim 22, wherein the predetermined action comprises providing feedback to a user to indicate that an event has been detected,                                                |
|       | [26.2]     | the mobile telecommunications device being configured, via execution of the instructions, to receive a user interaction to confirm or deny whether the detected event has actually occurred following said feedback.                 |
| 27    | [27.1]     | A non-transitory computer readable medium according to claim 26, wherein the feedback comprises notifying a user that a further action has been scheduled, and will be taken within a predetermined period,                          |
|       | [27.2]     | the mobile telecommunications device being further configured to receive a user interaction to confirm or deny whether the further scheduled action should be taken within a predetermined period.                                   |
| 28    | [28.1]     | A non-transitory computer readable medium according to claim 22, wherein the predetermined action comprises communicating to a remote system that an event has been detected,                                                        |

| Claim | Identifier | Claim Language                                                                                                                                                                                                                                              |
|-------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | [28.2]     | wherein execution of the instructions further enables the mobile telecommunications device to receive from the remote system a request to transmit to the remote system selected portions of the driving information associated with the detected event.    |
| 29    | [29]       | A non-transitory computer readable medium according to claim 22, wherein execution of the instructions further enables the mobile telecommunications device to manage voice-calls incoming to the mobile telecommunications device during a driving period. |
| 30    | [30]       | A non-transitory computer readable medium according to claim 22, wherein execution of the instructions further enables the mobile telecommunications device to enable a hands-free mode of operation on detection of the driving period.                    |
| 31    | [31]       | A non-transitory computer readable medium according to claim 30, wherein the hands-free mode of operation comprises enabling voice-activated commands on the mobile device.                                                                                 |
| 32    | [32.1]     | A non-transitory computer readable medium according to claim 22, wherein execution of the instructions further enables the mobile telecommunications device to detect the occurrence of a predetermined event of significance, such as a crash, and         |
|       | [32.2]     | in response to store driving information associated with that event to the memory.                                                                                                                                                                          |
| 33    | [33.1]     | A non-transitory computer readable medium according to claim 22, wherein execution of the instructions further enables the mobile telecommunications device to detect the occurrence of a predetermined event of significance, such as a crash, and         |
|       | [33.2]     | in response to transmit driving information associated with that event via the wireless telecommunication module to a remote data-logging system.                                                                                                           |
| 34    | [34]       | A non-transitory computer readable medium according                                                                                                                                                                                                         |

| Claim | Identifier | Claim Language                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |            | to claim 22, wherein the at least one predetermined action comprises providing the user with options to control the mobile device to take further actions.                                                                                                                                                                                                                                                        |
| 35    | [35.1]     | A non-transitory computer readable medium according to claim 21, wherein the memory comprises: a long-term memory for persistently storing driving information and a short-term memory for transiently storing driving information,                                                                                                                                                                               |
|       | [35.2]     | wherein the short-term memory receives driving information at a higher update rate than the long-term memory,                                                                                                                                                                                                                                                                                                     |
|       | [35.3]     | wherein execution of the instructions further enables the mobile telecommunications device to: write driving information to the short-term memory at a predetermined update rate during the driving period in a predetermined sequence; and,                                                                                                                                                                      |
|       | [35.4]     | overwrite the driving information previously written to the short-term memory in accordance with the predetermined sequence.                                                                                                                                                                                                                                                                                      |
| 36    | [36]       | A non-transitory computer readable medium according to claim 35, wherein execution of the instructions further enables the mobile telecommunications device to detect an occurrence of a predetermined event and in response transfer data from the short-term memory to the long-term memory.                                                                                                                    |
| 37    | [37]       | A non-transitory computer readable medium according to claim 21, wherein execution of the instructions further enables the mobile telecommunications device to:<br>interface with an external device, the external device having access to external driving information associated with a condition of the vehicle; and, receive at least a portion of the external driving information from the external device. |
| 38    | [38]       | A non-transitory computer readable medium according                                                                                                                                                                                                                                                                                                                                                               |

| Claim | Identifier | Claim Language                                                                                                                                                                                                                                            |
|-------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |            | to claim 37, further arranged to interface with the external device wirelessly.                                                                                                                                                                           |
| 39    | [39]       | A non-transitory computer readable medium according to claim 21, wherein the mobile telecommunications device utilizes its own power supply.                                                                                                              |
| 40    | [40]       | A non-transitory computer readable medium according to claim 21, wherein the mobile telecommunications device is a smartphone.                                                                                                                            |
| 41    | [41]       | A non-transitory computer readable medium according to claim 21, wherein the processing step comprises determination of at least one of: vehicle acceleration events and vehicle braking events.                                                          |
| 42    | [42]       | A non-transitory computer readable medium according to claim 41, wherein processing step comprises determination of vehicle swerving events and the determination of such events occurs when data from the sensor set accords with preset parameters.     |
| 43    | [43]       | A non-transitory computer readable medium according to claim 21, wherein the processing step comprises determination of both vehicle acceleration events and vehicle braking events.                                                                      |
| 44    | [44]       | A non-transitory computer readable medium according to claim 43, wherein processing step comprises the determination of vehicle swerving events and the determination of such events occurs when data from the sensor set accords with preset parameters. |
| 45    | [45.1]     | A non-transitory computer readable medium according to claim 21, wherein the mobile telecommunications device further comprises a proximity sensor and                                                                                                    |
|       | [45.2]     | the instructions, upon execution by the processor, enable the mobile telecommunications device to detect the                                                                                                                                              |

| Claim | Identifier | Claim Language                                                                                                                                                                                                                                                                                                          |
|-------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |            | proximity of the mobile telecommunications device to the vehicle.                                                                                                                                                                                                                                                       |
| 46    | [46.1]     | A mobile telecommunications device configured to log driving information associated with a vehicle, the mobile telecommunications device comprising:                                                                                                                                                                    |
|       | [46.2]     | a sensor set comprising an image sensor, an audio sensor, an accelerometer or a positioning module, or a combination thereof;                                                                                                                                                                                           |
|       | [46.3]     | a user interface;                                                                                                                                                                                                                                                                                                       |
|       | [46.4]     | a processor and;                                                                                                                                                                                                                                                                                                        |
|       | [46.5]     | a memory;                                                                                                                                                                                                                                                                                                               |
|       | [46.6]     | the mobile telecommunications device being configured to:<br><br>determine, based on at least one of the inputs received by the user interface and sensor data from the device's sensor set, a start of a driving period during which the mobile device is removably attached to the vehicle and the vehicle is in use; |
|       | [46.7]     | process the sensor data from the sensor set during the driving period to derive driving information associated with how the vehicle is driven; and                                                                                                                                                                      |
|       | [46.8]     | store a selection of the driving information to the memory;                                                                                                                                                                                                                                                             |
|       | [46.9]     | wherein the driving information is derived without data from the vehicle sensors and                                                                                                                                                                                                                                    |
|       | [46.10]    | the mobile telecommunications device is configured to process the sensor data by determination of at least one of: vehicle acceleration events; and vehicle braking events;                                                                                                                                             |
|       | [46.11]    | wherein the determining of such events occurs when data from the sensor set accords with predefined threshold values; and                                                                                                                                                                                               |

| Claim | Identifier | Claim Language                                                                                                                                                                                                                                                                                        |
|-------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | [46.12]    | wherein the mobile telecommunications device is controlled by a downloaded application to control the mobile device to process the driving information to generate a driving score associated with a particular driver.                                                                               |
| 47    | [47]       | A mobile telecommunications device according to claim 46, wherein the mobile telecommunications device is configured to process the sensor data by determination of vehicle swerving events and the determination of such events occurs when data from the sensor set accords with preset parameters. |
| 48    | [48]       | A mobile telecommunications device according to claim 46, wherein the mobile telecommunications device is configured to process the sensor data by determination of both vehicle acceleration events and vehicle braking events.                                                                      |
| 49    | [49]       | A mobile telecommunications device according to claim 48, wherein the mobile telecommunications device is configured to process the sensor data by determination of vehicle swerving events and the determination of such events occurs when data from the sensor set accords with preset parameters. |
| 50    | [50.1]     | A mobile telecommunications device according to claim 46, wherein the mobile telecommunications device further comprises a proximity sensor and                                                                                                                                                       |
|       | [50.2]     | the mobile telecommunications device is configured, upon execution of the instructions by the processor, to enable the mobile telecommunications device to detect the proximity of the mobile telecommunications device to the vehicle.                                                               |
| 51    | [51.1]     | A non-transitory computer readable medium having instructions comprising a software application stored thereon, wherein the instructions are configured to be executed on a processor of a mobile telecommunications                                                                                  |

| Claim | Identifier | Claim Language                                                                                                                                                                                                                                                          |
|-------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |            | device to enable the mobile telecommunications device to log driving information associated with a driver of a vehicle,                                                                                                                                                 |
|       | [51.2a]    | the mobile telecommunications device including a display;                                                                                                                                                                                                               |
|       | [51.3]     | a sensor set comprising an image sensor, an audio sensor, an accelerometer or a positioning module, or a combination thereof;                                                                                                                                           |
|       | [51.4]     | the processor; and                                                                                                                                                                                                                                                      |
|       | [51.5]     | a memory, wherein the instructions, upon execution by the processor, enable the mobile telecommunications device to:                                                                                                                                                    |
|       | [51.2b]    | present a user interface on the display;                                                                                                                                                                                                                                |
|       | [51.6]     | determine, based on at least inputs received by the user interface and sensor data from the sensor set, a start of a driving period during which the mobile telecommunications device is removably attached to a vehicle and the vehicle is being driven by the driver; |
|       | [51.7]     | process the sensor data from the sensor set during the driving period to derive driving information associated with how the vehicle is driven;                                                                                                                          |
|       | [51.8]     | store a selection of the driving information to the memory; and                                                                                                                                                                                                         |
|       | [51.9]     | generate a driving score associated with the driver,                                                                                                                                                                                                                    |
|       | [51.10]    | wherein the driving information is derived without data from vehicle sensors and comprises the determination of at least one of: vehicle acceleration events; and vehicle braking events;                                                                               |
|       | [51.11]    | wherein the determination of such events occurs when data from the sensor set accords with predefined threshold parameters.                                                                                                                                             |
| 52    | [52.1]     | A non-transitory computer readable medium according to claim 51, wherein the derived driving information                                                                                                                                                                |

| Claim | Identifier | Claim Language                                                                                                                                                                                                                                                                                                         |
|-------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |            | may further comprise the determination of vehicle swerving events and                                                                                                                                                                                                                                                  |
|       | [52.2]     | the determination of such events occurs when data from the sensor set accords with predefined threshold parameters.                                                                                                                                                                                                    |
| 53    | [53.1]     | A non-transitory computer readable medium according to claim 51, wherein the mobile telecommunications device further includes a proximity sensor, and                                                                                                                                                                 |
|       | [53.2]     | the instructions, upon execution by the processor, further enable the mobile telecommunications device to detect the proximity of the mobile telecommunications device to the vehicle.                                                                                                                                 |
| 54    | [54.1]     | A mobile telecommunications device configured to log driving information associated with a vehicle, the mobile telecommunications device comprising:                                                                                                                                                                   |
|       | [54.2]     | a sensor set comprising an image sensor, an audio sensor, an accelerometer or a positioning module, or a combination thereof;                                                                                                                                                                                          |
|       | [54.3]     | a user interface;                                                                                                                                                                                                                                                                                                      |
|       | [54.4]     | a processor and;                                                                                                                                                                                                                                                                                                       |
|       | [54.5]     | a memory;                                                                                                                                                                                                                                                                                                              |
|       | [54.6]     | the mobile telecommunications device being configured to:<br><br>determine, based on at least one of the inputs received by the user interface and sensor data from the device's sensor set, a start of a driving period during which the mobile device is removably affixed to the vehicle and the vehicle is in use; |
|       | [54.7]     | process the sensor data from the sensor set during the driving period to derive driving information associated with how the vehicle is driven; and                                                                                                                                                                     |
|       | [54.8]     | store a selection of the driving information to the memory;                                                                                                                                                                                                                                                            |

| Claim | Identifier | Claim Language                                                                                                                                                                                                                                                                                                         |
|-------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | [54.9]     | wherein the driving information is derived without data from the vehicle sensors, and                                                                                                                                                                                                                                  |
|       | [54.10]    | the mobile telecommunications device is controlled by a downloaded application to control the mobile device to process the driving information to generate a driving score associated with a particular driver.                                                                                                        |
| 55    | [55.1]     | A mobile telecommunications device configured to log driving information associated with a vehicle, the mobile telecommunications device comprising:                                                                                                                                                                   |
|       | [55.2]     | a sensor set comprising an image sensor, an audio sensor, an accelerometer or a positioning module, or a combination thereof;                                                                                                                                                                                          |
|       | [55.3]     | a user interface;                                                                                                                                                                                                                                                                                                      |
|       | [55.4]     | a processor and;                                                                                                                                                                                                                                                                                                       |
|       | [55.5]     | a memory;                                                                                                                                                                                                                                                                                                              |
|       | [55.6]     | the mobile telecommunications device being configured to:<br><br>determine, based on at least one of the inputs received by the user interface and sensor data from the device's sensor set, a start of a driving period during which the mobile device is removably affixed to the vehicle and the vehicle is in use; |
|       | [55.7]     | process the sensor data from the sensor set during the driving period to derive driving information associated with how the vehicle is driven,                                                                                                                                                                         |
|       | [55.8]     | the processing involving the use of a neural network on the mobile telecommunications device to determine whether the driving information represents an acceptable or unacceptable driving pattern; and,                                                                                                               |
|       | [55.9]     | store a selection of the driving information to the memory;                                                                                                                                                                                                                                                            |
|       | [55.10]    | wherein the driving information is derived without data from the vehicle sensors,                                                                                                                                                                                                                                      |

| Claim | Identifier | Claim Language                                                                                                                                                                                                      |
|-------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | [55.11]    | and the mobile telecommunications device is controlled by a downloaded application to control the mobile device to process the driving information to generate a driving score associated with a particular driver. |

United Services Automobile Association (“Petitioner” or “USAA”) petitions for *Inter Partes* Review (“IPR”) of claims 1-55 (“Challenged Claims”) of U.S. Patent No. 10,198,879 (“the ’879 Patent”).

## **I. REQUIREMENTS**

### **A. Grounds for Standing**

USAA certifies that the ’879 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 ’879 Patent less than one year ago. USAA-1004.

### **B. Challenge and Relief Requested**

USAA requests IPR and cancellation of the Challenged Claims on the grounds below. In support, a declaration from Dr. William Michalson<sup>1</sup> (USAA-1003) is furnished herewith.

| <b>Ground</b> | <b>Claims</b>                                             | <b>Basis</b>                                           |
|---------------|-----------------------------------------------------------|--------------------------------------------------------|
| 1A            | 1-3, 5, 8, 11-13, 19-23, 25, 28-31, 39, 41-49, 51, 52, 54 | §103: Forstall, Rabu, Warren, Langle2009               |
| 1B            | 4, 24                                                     | §103: Forstall, Rabu, Warren, Langle2009, Tamir        |
| 1C            | 6, 7, 16, 26, 27, 34                                      | §103: Forstall, Rabu, Warren, Langle2009, Balachandran |

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<sup>1</sup> Dr. Michalson is a professor in Robotics Engineering at the Worcester Polytechnic Institute.

| Ground          | Claims                               | Basis                                                  |
|-----------------|--------------------------------------|--------------------------------------------------------|
| 1D <sup>2</sup> | 9, 10, 14, 15, 17, 18, 32, 33, 35-38 | §103: Forstall, Rabu, Warren, Langle2009, Katayama     |
| 1E              | 14, 15, 32, 33                       | §103: Forstall, Rabu, Warren, Langle2009, Thompson2010 |
| 1F              | 40, 50, 53                           | §103: Forstall, Rabu, Warren, Langle2009, Willis       |
| 1G              | 55                                   | §103: Forstall, Rabu, Warren, Langle2009, Berkobin     |

The '879 patent was filed 3/9/2017, and claims priority, via several applications, to GB Pat. App. No. 1021292.6 filed 12/15/2010 ("Critical Date"). USAA does not concede that the Challenged Claims are entitled to the claimed priority, but applies prior art before the alleged date. USAA-1003, ¶¶13-15, 26-29.<sup>3</sup> Applied references are prior art:

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<sup>2</sup> Features recited by claims 14, 15, 32, and 33 are also disclosed by Katayama, as indicated in the citations to Katayama provided in this ground. *See* USAA-1024, [0046], [0050], [0051], [0075]. Because Forstall-Rabu-Warren-Langle2009-Katayama incorporates the teachings of Katayama in the manner discussed in §III.D.1, Curry-Rabu-Katayama also renders 14, 15, 32, and 33 obvious.

<sup>3</sup> In its Infringement Complaint, Patent Owner ("PO") stated "[t]he '879 Patent ... claims priority to PCT Application No. PCT/GB2011/052492, filed on December 15, 2011." USAA-1004, 10.

| Reference    | Date(s)                | Basis              |
|--------------|------------------------|--------------------|
| Forstall     | 4/15/2010              | §102(a)            |
| Rabu         | 12/15/2009             | §102(e)            |
| Langle2009   | 8/31/2009              | §102(b)            |
| Warren       | 3/9/2006               | §102(b)            |
| Tamir        | 2/1/2007<br>10/26/2010 | §102(b)<br>§102(a) |
| Balachandran | 6/6/2000               | §102(b)            |
| Katayama     | 4/23/2008              | §102(b)            |
| Thompson2010 | 7/2/2010               | §102(a)            |
| Willis       | 10/11/2007             | §102(b)            |
| Berkobin     | 10/16/2008             | §102(b)            |

### C. Claim Construction

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

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

the mobile telecommunications device being configured to: determine, based on at least one of the inputs received by the user interface and sensor data from the device's sensor set, a start of a driving period during which the mobile device is removably attached to the vehicle and the vehicle is in use<sup>4</sup>

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<sup>4</sup> Claims 21, 46, 51, and 54-55 recite the same/similar language.

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.” USAA-1003, ¶¶62, -128. 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, ¶128. The ’879 patent specification is similarly unbounded, as it expressly recognizes several driving period options that are untethered from, e.g., the beginning of the user driving the vehicle: “the mobile device [] register[s] the start of a driving period in response to an initialisation input,” which may be “the user manually executing the application on the mobile device[,]” “the mobile device being installed to the vehicle and/or the vehicle being driven.” USAA-1001, 3:32-62; USAA-1003, ¶129.

Thus, this claim term establishes two distinct “driving period” attributes: (1) “the mobile device is removably attached to the vehicle” and (2) “the vehicle is in use.” USAA-1003, ¶130. These attributes may be satisfied by a start of a monitoring period, whether at the onset of vehicle driving or whether instead before or thereafter. *Id.*

## II. THE '879 PATENT

### A. Specification

The '879 patent is directed to a mobile device that conventionally “monitor[s] and process[es] sensor data” to “derive driving information” related to “a driver’s driving performance.” USAA-1001, 1:22-30, 1:49-58, 13:36-56; 13:18-35; ; USAA-1003, ¶¶30-61.

Figure 1 shows an exemplary system:

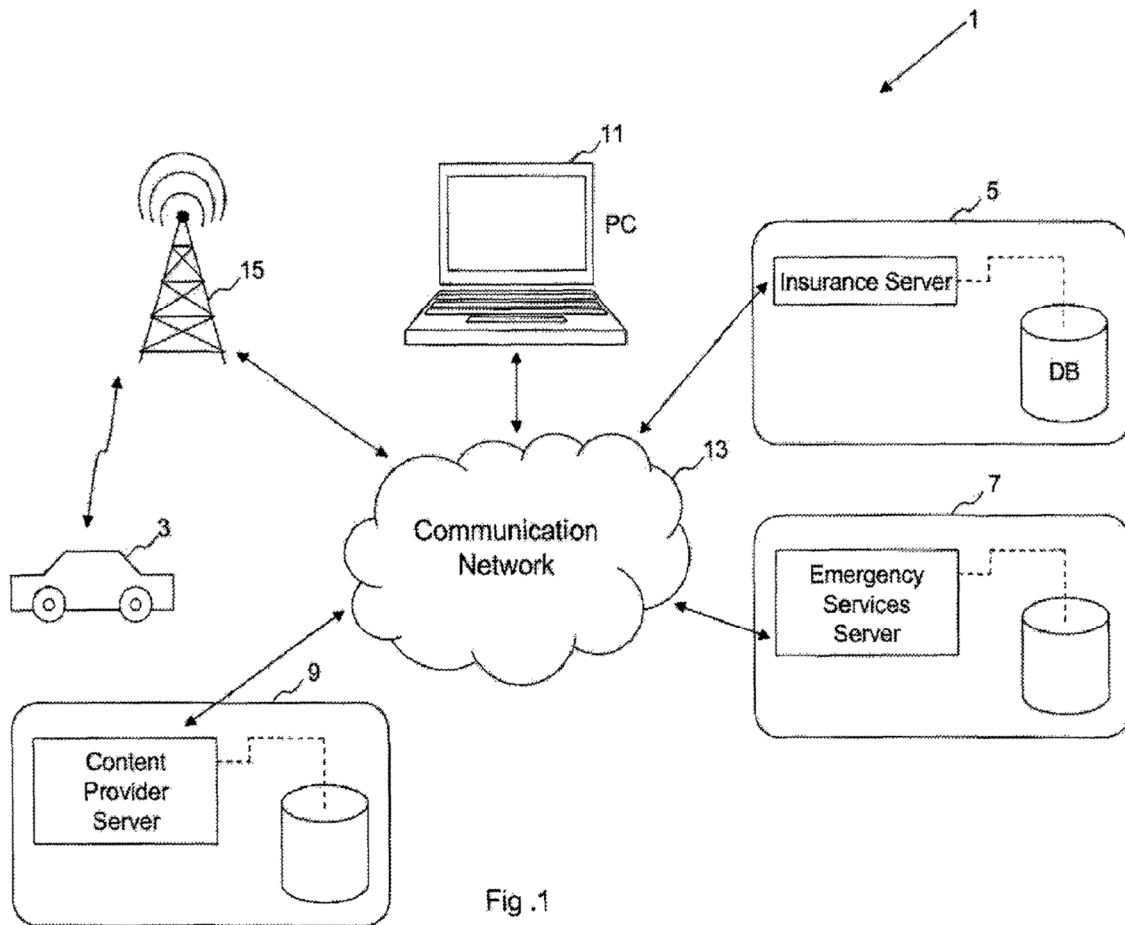


Fig. 1

USAA-1001, Fig. 1

## **B. Prosecution History**

During prosecution, the Examiner rejected the claims over U.S. Pub. Nos. 2010/0030540 (“Choi”), 2010/0157061 (“Katsman”), and 2012/0166583 (“Koonce”). *See* USAA-1002, 117-36. This petition addresses claim features distinguished during prosecution using new combinations of prior art, none of which were previously considered. USAA-1003, ¶61.

## **III. THE CHALLENGED CLAIMS ARE UNPATENTABLE**

### **A. [GROUND 1A] – Forstall-Rabu-Langle2009-Warren Renders Claims 1-3, 5, 8, 11-13, 19-23, 25, 28-31, 39, 41-49, 51, 52, 54 Obvious**

#### **1. Forstall-Rabu-Langle2009-Warren**

##### **(a) *Forstall***

Forstall describes using a mobile device (e.g., smartphone) with embedded accelerometers and/or positioning sensors for vehicle navigation. USAA-1028, [0004]; USAA-1003, ¶63. The mobile device provides “the ability to provide directions from a point of origin to a destination” and “display[s] a current position on a map as well as deliver navigation instructions based on the current position to route a user to a desired destination.” *Id.* Figure 1 shows an example of a mobile device 100 used for vehicle navigation.

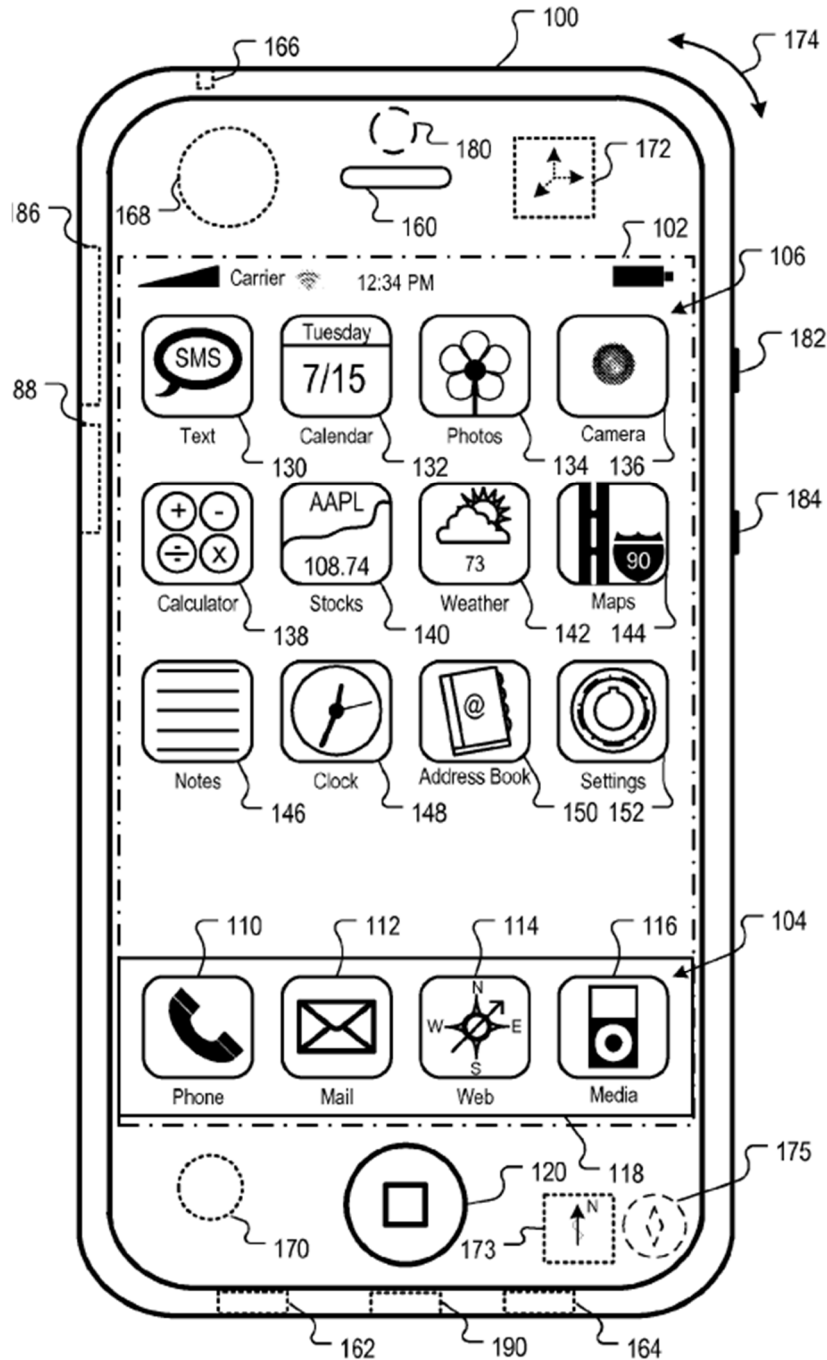


FIG. 1

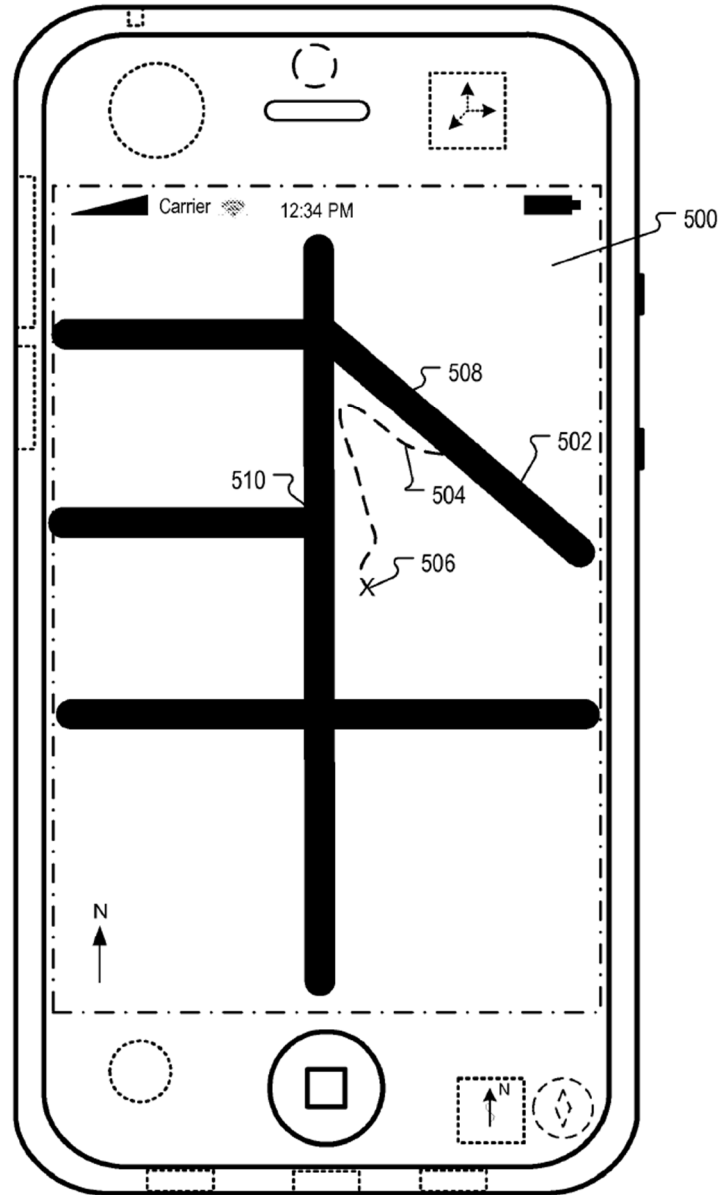
USAA-1028, Fig. 1

Device 100 can be implemented as “a handheld computer, a personal digital assistant, a cellular telephone, a network appliance, a camera, a smartphone,...”

among others. USAA-1028, [0024]. The embedded sensors used to “detect motion movement of the mobile device 100” include proximity sensor 168, ambient light sensor 170, accelerometer 172, compass 173, and gyroscope 175. *Id.*, [0036]; USAA-1003, ¶64.

Device 100 runs a navigation application that “provide[s] navigation information, e.g., map information, location information, route information, and other information.” USAA-1028, [0042]. A user can access the navigation application running on device 100 by interacting with an object presented on a graphic interface. USAA-1028, [0030]-[0033]. For example, in Figure 1, “invoke[s] a map functionality, e.g., by pressing the maps object 144 on the top-level graphical user interface...and has requested and received a map for the location ‘1 Infinite Loop, Cupertino, Calif.’” *Id.*, [0042]; USAA-1003, ¶65.

The navigation application running on device 100 provides graphical interfaces relating to vehicle navigation. For example, Figure 5 (below) shows an exemplary map display 500 “shows a number of streets and a point of origin ‘O’ 502[,]” and paths “measured by the device 100 from the origin 502 to a destination” (dashed line 504, solid line 508). USAA-1028, [0072]; USAA-1003, ¶66.



USAA-1028, Fig. 5

Figure 2 (below) illustrates an exemplary network environment enabling the navigation application to obtain data relating to real-time navigation using “one or more services 230, 240, 250, and 260.” USAA-1028, [0042], [0082]. For example, “navigation service 230 can provide navigation information, e.g., map

information, location information, route information, and other information, to the mobile device 100.” *Id.*, [0042]. Additionally, device 100 “communicate[s] with one or more GPS Satellite(s) 252 to enable circuitry and sensors (e.g., a GPS receiver on the mobile device 100) to support a location determining capability.” *Id.*, [0045]; USAA-1003, ¶67.

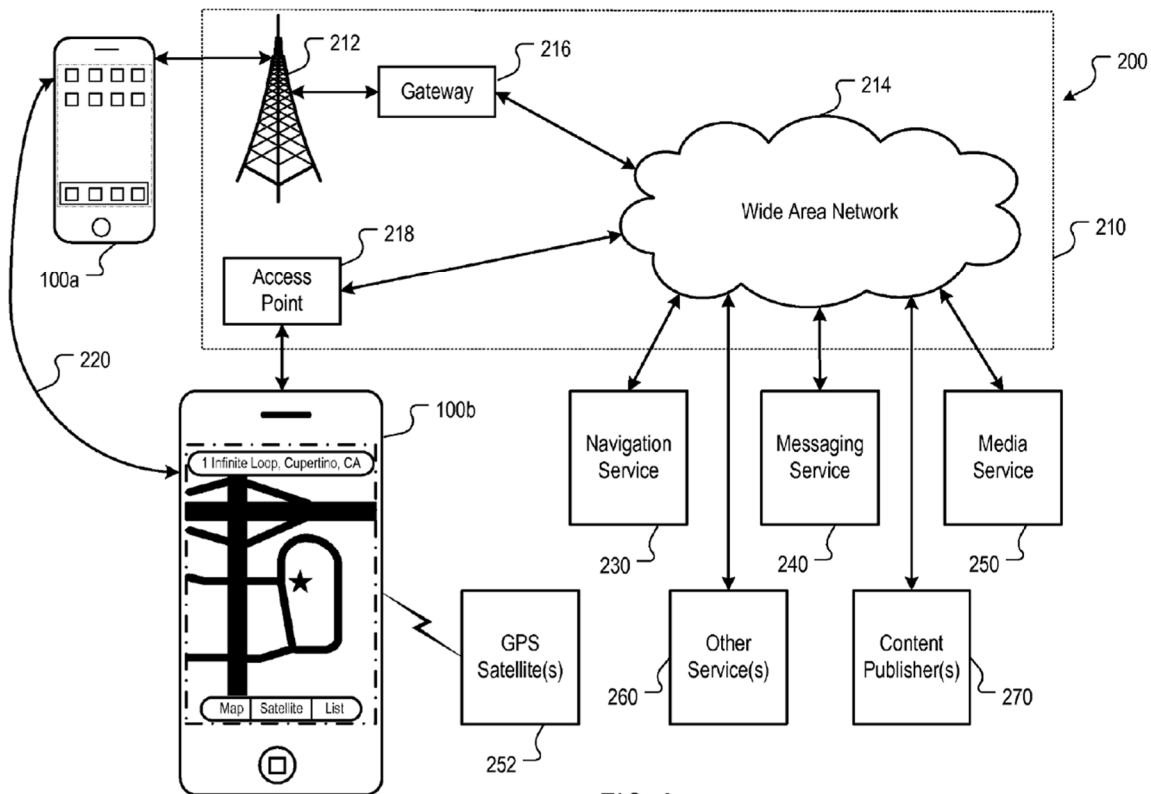


FIG. 2

USAA-1028, Fig. 2

Device 100 can use “dead reckoning[,]” where “[s]ensor data from accelerometers, a compass, gyroscopes, and impact sensors can be used alone or in combination” to “measure the movement of device 100 from a point of origin or known location (a ‘fix’) to determine the device’s location relative to the fix.”

USAA-1028, [0062]. Such location measurement techniques are useful “where no satellite or terrestrial positioning signal information is available...” and Forstall teaches configurations device 100 “switch[es] into a dead reckoning positioning mode upon another positioning mode becoming unavailable.” *Id.* In this mode, “an accelerometer reading” is used to “determine how the device [100] is positioned relative to the earth’s gravity[,]” which enables detection of “which direction is down relative to the positioning of the device.” *Id.*, [0070]; USAA-1003, ¶68.

Device 100 can be set to different modes to selectively adjust the use of dead reckoning functions (e.g., using accelerometer measurements for location measurement). When device 100 is set to a “vehicle mode,” “dead reckoning functions are active” and a “default dead reckoning mode” is used. USAA-1028, [0064]. For example, in vehicle mode, “sudden accelerations in a positive or negative direction along the axis of the earth's gravity are given a reduced importance” for dead reckoning position measurement since “[a]ccelerations along this axis are discounted as they are likely caused by undulations of a traveling Surface and reactions thereto by a vehicle suspension system.” *Id.*, [0070]. In contrast, “[a]ccelerations along the axes perpendicular to the detected gravity axis are given enhanced weight” since “it is primarily these accelerations that contribute to displacement of the vehicle from a known fix to a second position to

be measured via dead reckoning and displayed on a map.” *Id.*; USAA-1003, ¶69.

Another mode of device 100 is “walking mode,” where “a walking mode of dead reckoning position measurement” is used for location measurement, e.g., using data collected by “a footwear impact sensor” and “detecting walking motions” such as “periodic accelerations indicative of steps being taken by a user.” USAA-1028, [0065]. For example, in the “walking mode,” device 100 “combines pedometer functions with compass measurements without use of accelerometer or gyroscope data.” *Id.*, [0071]; USAA-1003, ¶70.

(b) *Rabu*

Rabu likewise uses an accelerometer within a “portable media device” (“PMD”) (e.g., “smart phone”). USAA-1013, Abstract, 1:1-52, 1:60-2:11, 3:11-28, 6:49-7:6, Figs. 1-8. Rabu leverages the accelerometer both to determine whether the PMD is located in a moving or stationary vehicle, and to determine whether the PMD “is in a dock, resting on a surface, or being handled by a person.” *Id.* Based on those determinations, Rabu “choose[s] a particular mode of operation” for the PMD that can promote driver safety by restricting problematic phone interactions. USAA-1013, 1:53-59, 8:13-10:42, Fig. 5; USAA-1003, ¶¶71-75. For example, as explained with respect to processing illustrated by Figs. 7 and 8 (below), if the PMD is “docked in a moving vehicle,” an operating mode with relatively few restrictions might be chosen. USAA-1013, 8:13-10:42, Figs. 5, 7, 8;

USAA-1003, ¶75. Conversely, “if the PMD determines that [it] is being held” while driving, the PMD can for example “prevent the driver from sending or receiving text messages.” USAA-1013, 12:26-43; USAA-1003, ¶75.

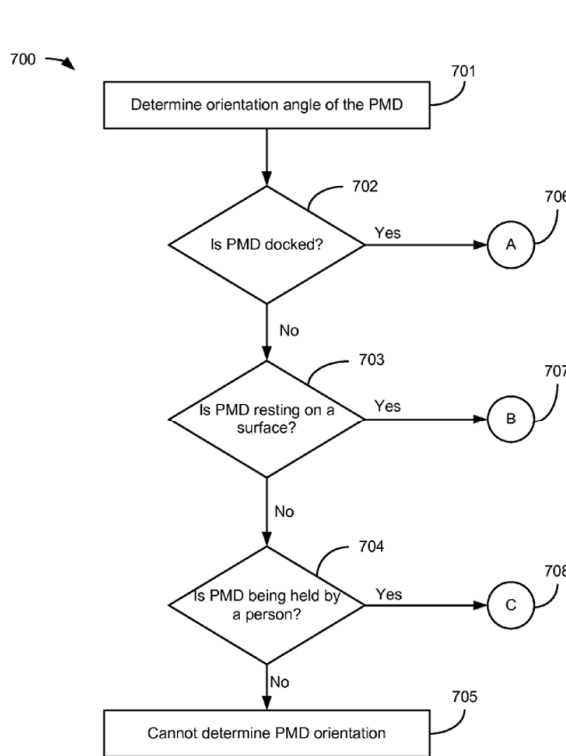


FIG. 7

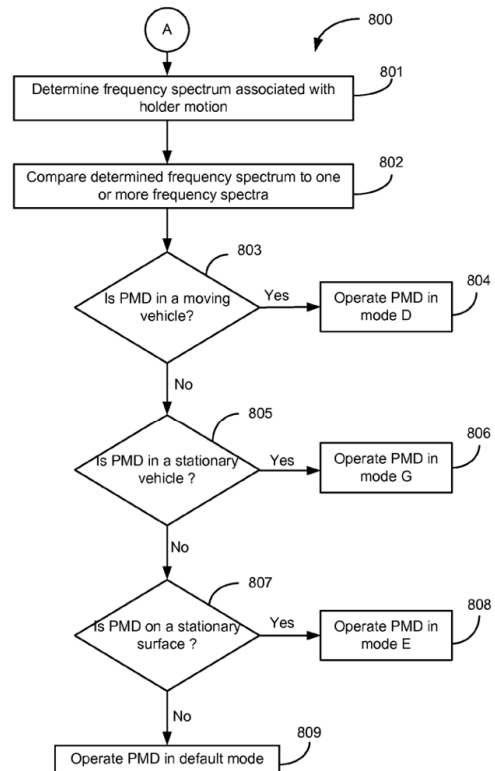


FIG. 8

Rabu’s PMD is mounted using an “automobile dock.” USAA-1013, 3:11-45, Figs. 1, 2. Figures 1-3 (below) show PMD 100 “coupled to dock 200” and positioned “at an angle 302...” *Id.*, 3:46-50. Rabu leverages this “orientation” angle to confirm whether the PMD is coupled to dock 200, and to switch to an associated operating mode. USAA-1013, 3:29-4:4, 8:13-24, Figs. 2, 7, 3:46-4:4; USAA-1003, ¶72.

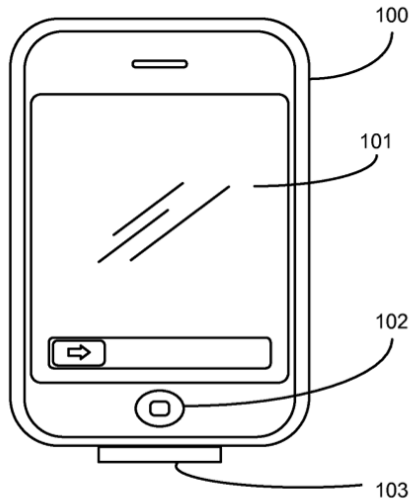


FIG. 1

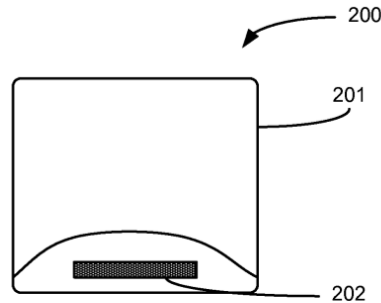


FIG. 2

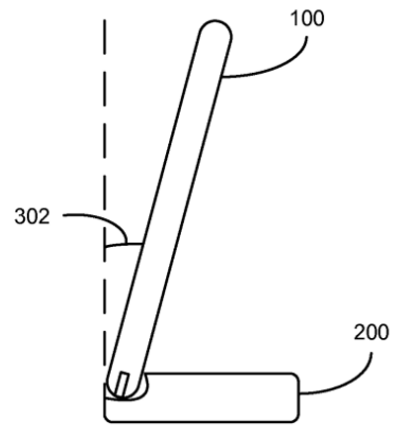
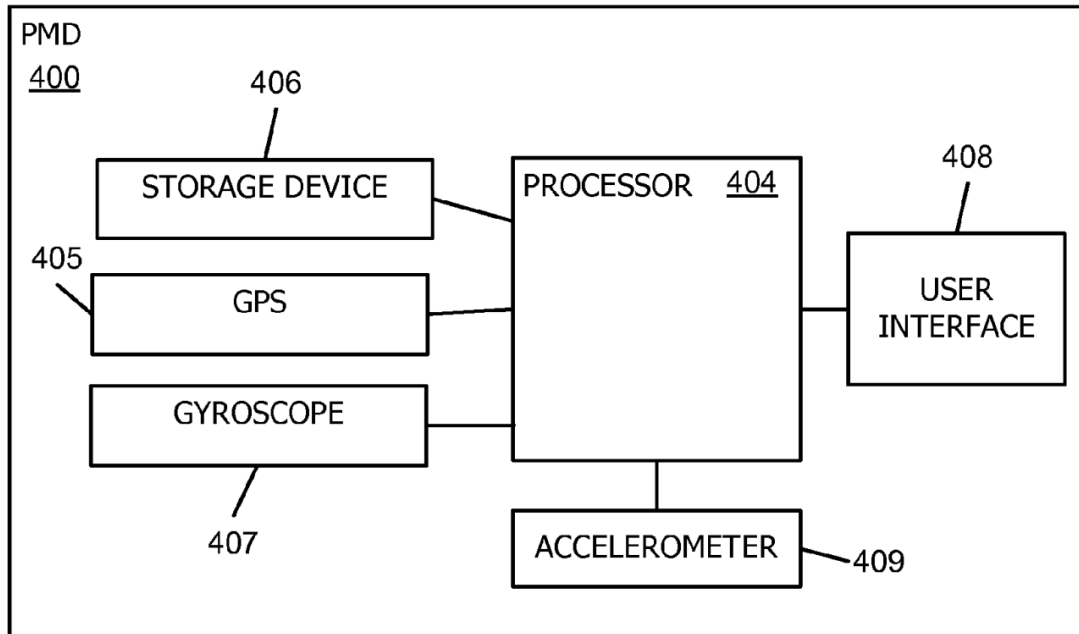


FIG. 3

USAA-1013, Fig. 1

Figure 4 (below) shows PMD 400 with processor 404, user interface 408, accelerometer 409, (GPS) device 405, and storage device 406. USAA-1013, 4:15-20. Processor 404 uses accelerometer 409 to determine the PMD's motion status and orientation angle. USAA-1013, 3:1-28, 4:21-40, Figs. 1, 4; USAA-1003, ¶¶73-75.



USAA-1013, Fig. 4

(c) *Langle2009*

Langle2009 is focused on using mobile devices to “aid in safe driving practices and detection of emergencies.” USAA-1029, 502. discloses a technique of using a “Google phone” (“T-Mobile G1”) to “classify safe versus unsafe driving[.]” using sensor data collected by the phone, such as “breaking distance, acceleration, and deceleration...” *Id.*; USAA-1003, ¶76.

Langle2009 recognizes that mobile phones include “embedded accelerometers” that are “used for risk level detection while riding in a vehicle.” USAA-1029, 502. It also states that “[p]rogramming with accelerometers on the Android platform is straightforward and supports three axes[.]” and thus, “[u]sing accelerometer measurements, it should be possible to classify driving habits as safe

or unsafe.” The technique described in Langle2009 “look[s] at the two horizontal axes to determine the safety level of the driver. *Id.*; USAA-1003, ¶77.

Langle2009 characterizes unsafe driving activity based on driving behaviors, such as braking and lane changing. Figure 2 illustrates acceleration measurements indicative of unsafe acceleration. USAA-1003, ¶78.

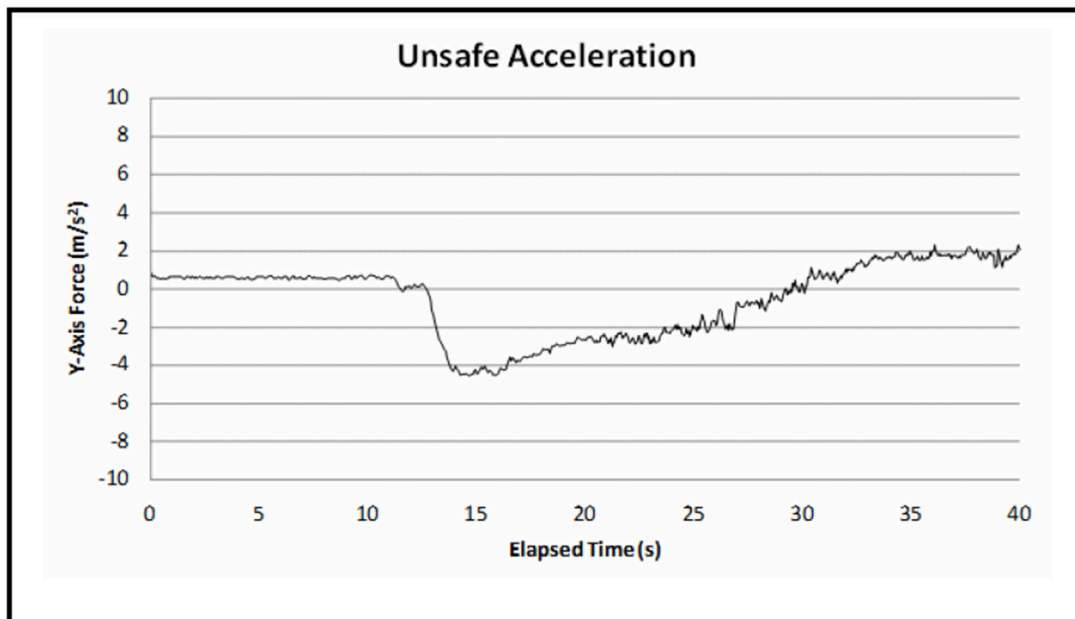


Figure 2. Unsafe Acceleration

USAA-1029, Fig. 2

Figure 5 illustrates acceleration measurements indicative of unsafe lane changing.

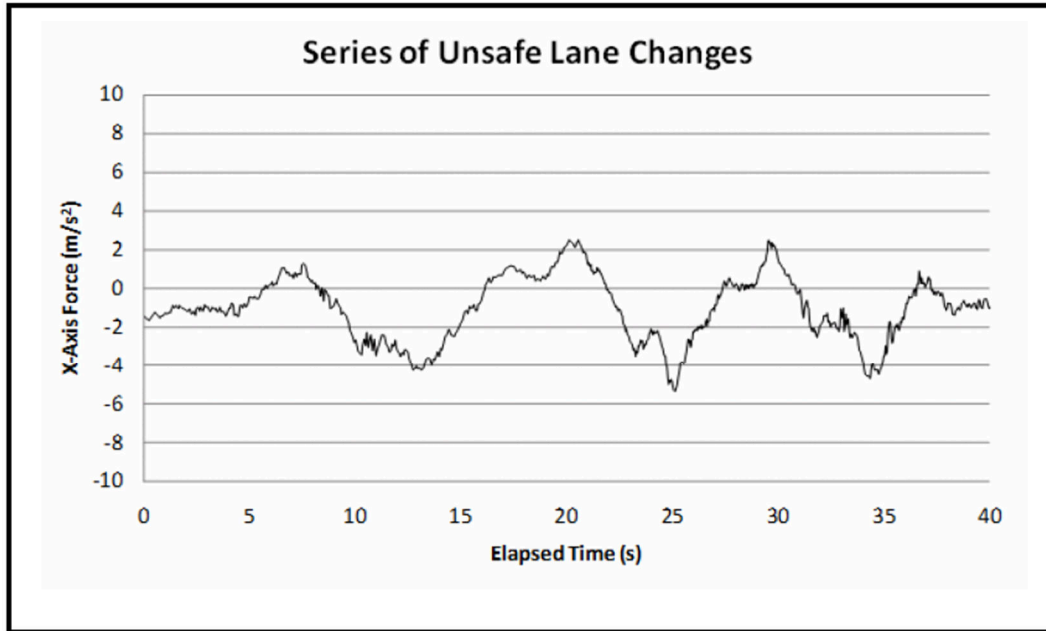


Figure 5. A Series of Unsafe Lane Changes

USAA-1029, Fig. 5

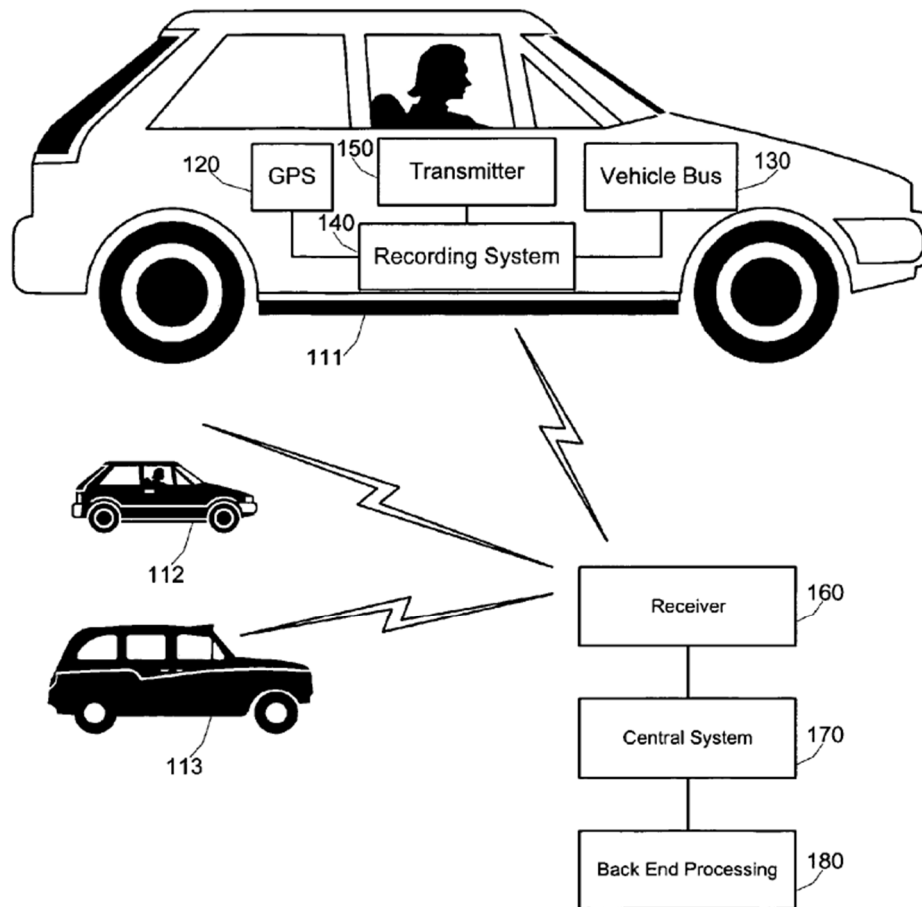
(d) *Warren*

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

USAA-1030, Abstract. The driver score is “applied to ascertain the risk of insuring a particular driver” and “a tool for defining or adjusting the terms of an insurance policy for an insured driver.” *Id.* This enables “more accurate and profitable insurance policies.” *Id.*; USAA-1003, ¶80.

Figure 1 shows an exemplary system for collecting vehicle operation data used to compute a driver score. A vehicle 111 is equipped with a vehicle recording

system 140 with interfaces (GPS interface 120, vehicle bus interface 130) for collecting monitoring information, including “speed of the vehicle,” “motion through the use of an accelerometer,” “the location of the vehicle,” and “direction of motion.” USAA-1030, [0020]. The collected information is stored locally information locally and/or transmitted to central system 170. *Id.*; USAA-1003, ¶81.



USAA-1030, Fig. 1

The driver score “reflects a qualitative view of the driving characteristics for a particular vehicle or a combination of a vehicle and driver,” for example, “a risk

level associated with insuring a particular driver.” USAA-1030, [0024]; USAA-1003, ¶82. Other examples include “the accuracy of information provided to an insurance company,” “compliance of a teenaged driver within guidelines established by his or her parents,” and “compliance of teenaged drivers with local/regional laws...” *Id.* The driver score can also “reflect[] an insurance risk and is used to either increase or decrease an insurance premium or otherwise modify the terms of an insurance policy.” *Id.*, [0026]. As shown in Table 1 (below), driver scores can be computed for different scenarios and used to represent “a risk level associated with insuring a particular driver.” *Id.*, [0024].

TABLE 1

| Time of Day | Normal Traffic | Peak Traffic | Risk Traffic    | Weighted Score |
|-------------|----------------|--------------|-----------------|----------------|
| Risk Factor | 0.60           | 1.40         | 2.50            |                |
| Driver A    | 20%            | 75%          | 5%              | 1.295          |
| Driver B    | 80%            | 20%          | 0%              | 0.760          |
| Driver C    | 20%            | 20%          | 60%             | 1.900          |
|             |                |              | (capped at 50%) | 1.650          |

USAA-1030, [0028]

(e) *Proposed Combination*

(i) Forstall, Rabu

A person of ordinary skill in the art at the time of the '487 patent (a “POSITA”<sup>5</sup>) would have found it obvious to integrate Rabu’s dock status sensing

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<sup>5</sup> USAA-1003, ¶¶14-15 (defining a POSITA)

and associated mode-shifting capabilities into Forstall's device 100, thereby enhancing the device's ability to promote safe driving. USAA-1003, ¶¶98-99. As explained below, the resulting device would have added functionality, as it would be capable of defining and determining different types of driving periods based on user inputs and sensor data (including one in which the phone is docked within a moving vehicle, and another in which the phone is undocked within a moving vehicle). *Id.*

For example, the Forstall-Rabu device would have leveraged orientation and motion data from its accelerometer to determine both vehicle motion and phone docking status upon a user initiating an adaptive navigation period. USAA-1003, ¶100; USAA-1013, 3:1-10, 4:21-33, 8:13-10:42, 15:7-22, Figs. 1, 4-5, 7-8.

Consistent with both Forstall and Rabu, the Forstall-Rabu device would have provided a basis for changing the operational mode to "vehicle mode," which would have enabled position measurement using a "default dead reckoning mode." USAA-1003, ¶100; USAA-1028, [0064], [0070]; USAA-1013, 3:1-10, 4:21-33, Figs. 1, 4. For example, a POSITA would have found it obvious to leverage motion and orientation data from accelerometer 172 to detect whether device should operating in "vehicle mode." USAA-1003, ¶100; USAA-1028, [0070].

A POSITA would have also been motivated to seek practical solutions relating to Forstall's vehicle mode detection since its disclosure lacks

implementation details relating to detecting a vehicle mode absent some explicit user indication. USAA-1003, ¶¶101-102; USAA-1028, Abstract, [0064]-[0071].

Those solutions are found within Rabu. USAA-1003, ¶¶103-112. Like Forstall, Rabu is focused on mode detection by a mobile device, and further teaches how mode detection improves the use of a mobile device for monitoring when used in a vehicle. The Rabu device leverages a “generally conventional” accelerometer (also in Forstall’s device) to determine its orientation angle and motion status, which is used to determine if it has been docked within a moving vehicle, which enables a change in the operational mode (as opposed, for example, to being hand-held). USAA-1013, 3:1-10, 4:21-33, 8:13-10:42, Figs. 1, 4.

Forstall and Rabu would have also motivated a POSITA to supplement the detection of a “vehicle mode” on Forstall’s device based on user input. USAA-1028, [0064]. Forstall teaches a “navigation settings screen 400” through which a user can access a “user selectable touch-sensitive display button 402” to “toggle dead reckoning functions on or off.” *Id.*; USAA-1003, ¶¶106-112. The POSITA would have found obvious that enabling the device to automatically detect a “vehicle mode” using a docked/undocked status would introduce multiple additional advantages. *See id.*, ¶106.

(ii) Forstall-Rabu, Langle2009

As discussed in §III.A.1(a), Forstall describes using a navigation application

running on mobile device for vehicle navigation. USAA-1028, [0004], [0030]-[0033], [0042], [0072]. Mobile-based navigation systems were known to increase the risk of accidents since they typically involve mounting a mobile device to a vehicle dashboard so that a user may view navigation information while driving. USAA-1003, ¶113 (citing USAA-1031, [0002]). This safety risk would have motivated a POSITA to venture beyond Forstall's disclosure to well-known vehicle monitoring systems specifically concerned with safety. *Id.* USAA-1003, ¶114 (citing USAA-1032, 323; USAA-1024, [0004]-[0008]).

One such reference, Langle2009, described a technique to predict accident-related risks. USAA-1029, 1; USAA-1003, ¶115. Like Forstall, Langle2009's technique utilizes embedded sensors of mobile phones, including accelerometer data and position data. *Id.* Langle2009 teaches "mobile phones may be used to aid in safe driving practices and detection of emergencies[,]" and thus, the sensors used for improving safety are already present in Forstall's device. USAA-1029, 1; USAA-1003, ¶115. A POSITA would have reasonably succeeded in incorporating Langle2009's safety techniques into Forstall's mobile device since Langle2009 recognizes that "[p]rogramming with accelerometers...is straightforward and supports three axes." USAA-1003, ¶116 (citing USAA-1032, 323-24; USAA-1031, [0014]-[0018]); USAA-1077, 3-12.

(iii) Forstall-Rabu-Langle2009, Warren

As previously discussed, Langle2009 describes techniques to improve driver safety by evaluating accelerometer data to identify unsafe driving behaviors.

USAA-1030, 502. Langle2009 indicates that “look[ing] at the two horizontal axes [of movement of a mobile device]” can be used to “determine the safety level of **the driver**.” USAA-1029, 502. A POSITA would have understood from and/or found it obvious from this disclosure that unsafe behaviors are driver-specific, and thereby looked to techniques for improving its use to improve driver safety.

USAA-1003, ¶117.

Indeed, “by the Critical Date, one common and well-known technique of improving driver safety is by using a “safety metric” to “numerically represent[]” “how safe or unsafe certain driving behaviors were based on evaluating recorded motion data.” USAA-1003, ¶118 (citing USAA-1030, Abstract, USAA-1045, [00401]). With this knowledge, a POSITA would have looked to incorporate the use of such techniques into the Forstall-Rabu-Langle2009 combination as this would improve Langle2009’s focus on “classify[ing] driving habits as safe or unsafe.” USAA-1029, 502; USAA-1003, ¶118. Indeed, “numerical scores would have enabled the Forstall-Rabu-Langle2009 combination to use thresholds to differentiate between safe driving activity and unsafe driving activity and simplify the processing needed for effective classification without needed to compare the activity graphs presented in Langle2009.” USAA-1003, ¶118 (citing USAA-1030,

Figs. 1-5).

Warren describes an exemplary technique for “monitoring vehicle operation and using the collected data to calculate a driver score.” USAA-1030, Abstract. The driver score indicates “a risk level associated with insuring a particular driver.” USAA-1030, [0024]. A POSITA would have regarded Warren’s driver score to be reasonably pertinent to Forstall and Langle2009 since all three disclosures are generally focused on improving driver safety through monitoring vehicle motion data. USAA-1003, ¶119. Moreover, incorporating Warren’s driver score into the Forstall-Rabu-Langle2009 combination would have been harmonious—and advanced—Langle2009’s overall motivation to increase the use of mobile devices “as a black box to determine varying levels of risk while riding in a vehicle.” USAA-1029, 502. A POSITA would have also had a reasonable expectation of success in implementing the combination without invention since each reference—Forstall, Langle2009, Warren—contemplates using the same type of data (accelerometer data) to monitoring driving activity. USAA-1003, ¶119 (citing USAA-1028, [0061], [0067]); USAA-1029, 502; USAA-1030, [0020]). Additionally, “a POSITA would have understood that the types of driving conditions that Warren describes are monitored to compute its driving score would have been derived from the sensors in the mobile devices disclosed in Forstall and Langle2009.” *Id.*

## 2. Claim 1

### [1.1]

To the extent the preamble is limiting, the combination discussed in §III.A.1(e) renders it obvious. USAA-1003, ¶120. The combination includes a device (“*mobile telecommunications device*”), which may be “a handheld computer, a personal digital assistant, a cellular telephone, a network appliance, a camera, a smartphone[.]” USAA-1028, [0024], Fig. 1.<sup>6</sup>

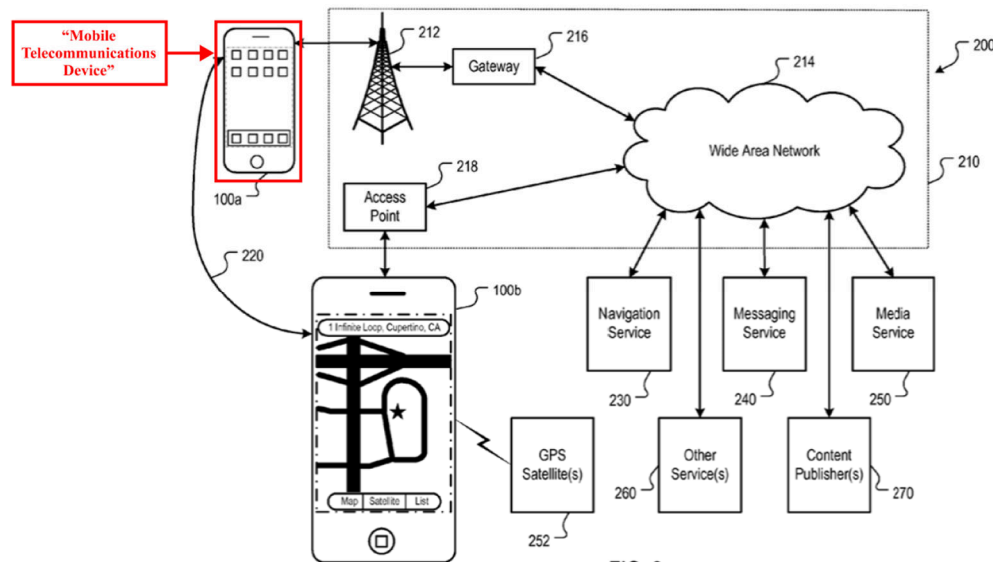


FIG. 2

Forstall, Fig. 2 (annotated)

The device provides “adaptive mobile device navigation” where “a device position is stored in memory,” “sensor data is received from a motion sensor measuring movement of the device[.]” and “sensor data is compared to map data

<sup>6</sup> Unless otherwise indicated, all emphasis has been added in the Petition.

corresponding to the device location.” USAA-1028, [0006]. Based on these disclosures, a POSITA would have understood that the Forstall-Rabu-Langle2009-Warren device logs vehicle movement (“*driving activity associated with a vehicle*”). *Id.*, [0065]-[0071]; USAA-1003, ¶121.

**[1.2]**

The Forstall-Rabu-Langle2009-Warren device includes integrated sensors (“*a sensor set*”) including accelerometer 172 (“*accelerometer*”) and compass 173 and/or gyroscope 175 (“*positioning module*”). USAA-1028, [0061] (“the device 100 includes one or more of an accelerometer 172, a magnetic compass 173, and/or a gyroscope 175[,]” which can be used alone or in combination to “measure movements of the device 100”); [0061]; USAA-1003, ¶122.

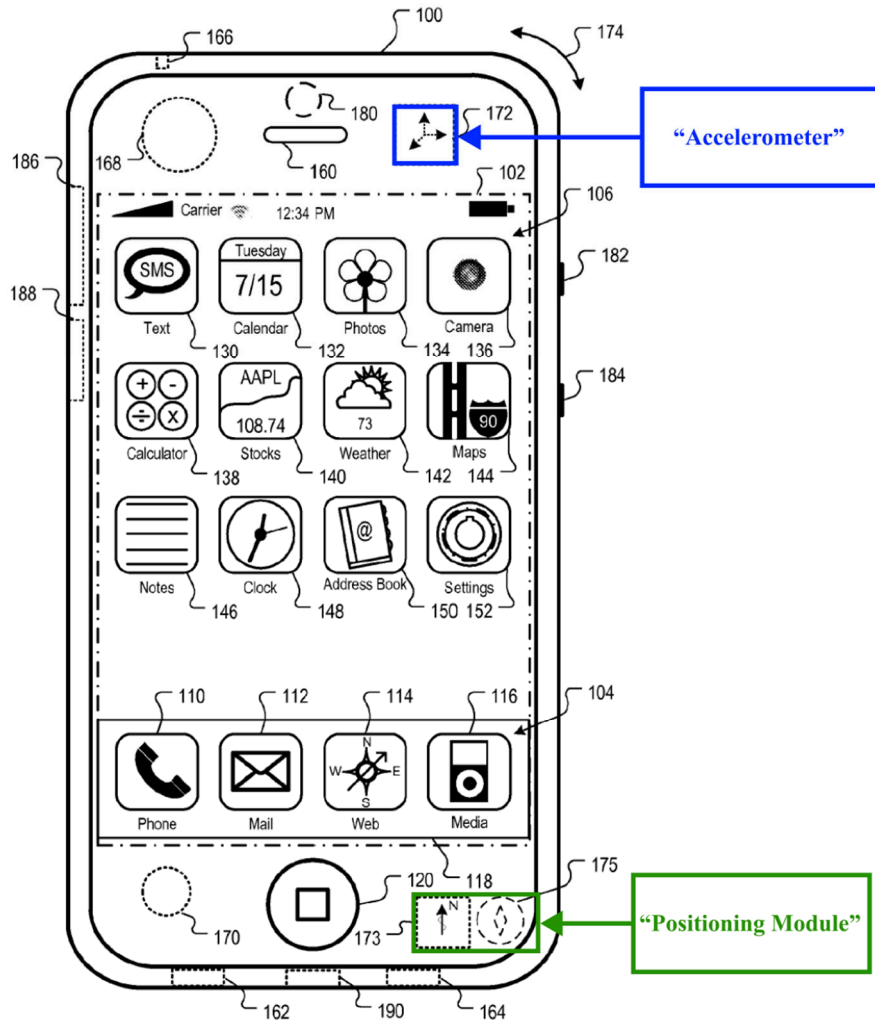


FIG. 1

Forstall, Fig. 1 (annotated)

Data from the device's sensors is used to “measure the movement of the device [] from a point of origin or a known location” and “determine the device's location” relative to the known location. USAA-1028, [0062]. Forstall also discloses embodiments of a device with “an integrated GPS receiver” (*id.*, [0045]) and “circuitry and sensors for supporting a location determining capability such as that provide by [GPS] or other positioning systems...” (*id.*, [0036]). In the

combination (*see* §III.A.1(e)), a POSITA would have further configured the device to process sensor data related to movement of the Forstall-Rabu-Langle2009-Warren device to identify unsafe driving behaviors (e.g., unsafe acceleration, unsafe braking), which would have been obvious to represent as a numerical score (e.g., driver risk score). *See* §III.H.4, *supra*; USAA-1029, 502; USAA-1030, [0020]; USAA-1003, ¶123.

**[1.3]**

The Forstall-Rabu-Langle2009-Warren device runs a navigation application that “display[s] one or more graphical user interfaces on [a] touch-sensitive display 102 for providing the user access to various system objects and for conveying information to the user.” USAA-1028, [0027]. For example, the navigation application displays map display 500 (“*user interface*”) with “an example path measured by the device 100 from [an] origin 502 to a destination 510...” *Id.*, [0072]; USAA-1003, ¶124.

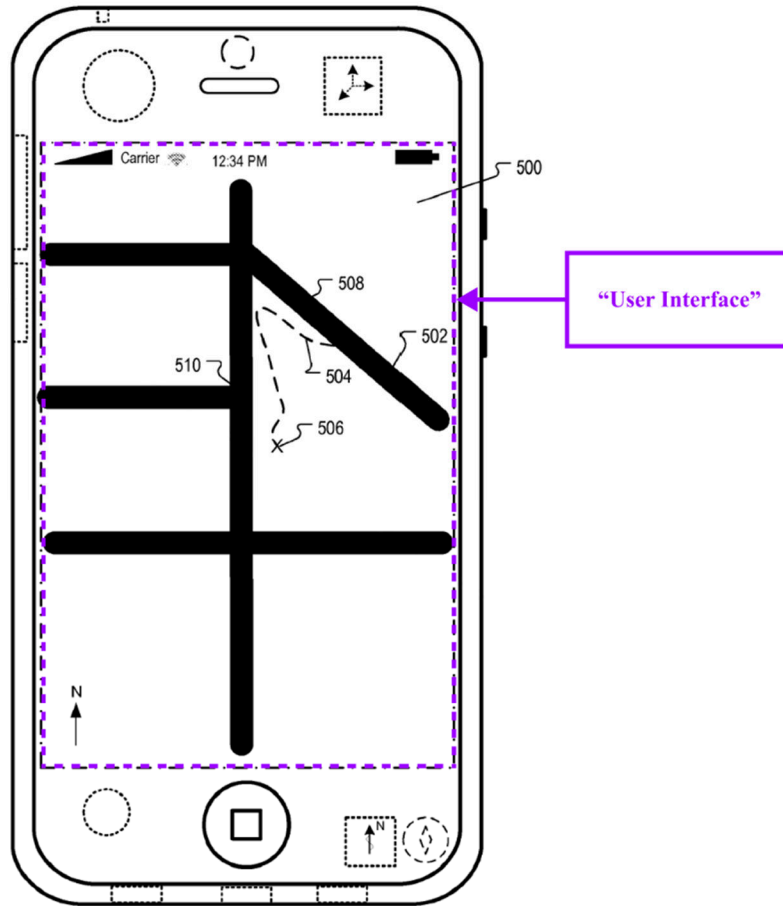


FIG. 5

USAA-1028, Fig. 5 (annotated)

[1.4]

The Forstall-Rabu-Langle2009-Warren device includes “one or more processors” (“*processor*”) for interpreting sensor data “received from one or all of the accelerometer 172, compass 173, and/or gyroscope 175.” USAA-1028, [0074]. The one or more processors “[u]se an on board clock” to “interpret the sensor data as movement of the device 100[,]” and “determine velocity, and position[,]” and/or a direction of travel. *Id.*; USAA-1003, ¶125.

**[1.5]**

Forstall-Rabu-Langle2009-Warren device includes memory (“**memory**”) for storing information relating to “adaptive mobile device navigation,” such as “a device position.” USAA-1028, [0006]. In one exemplary embodiment, the device includes “memory 350” that includes “high-speed random access memory and/or non-volatile memory,” e.g., “one or more magnetic disk storage devices, one or more optical storage devices, and/or flash memory (e.g., NAND, NOR).” *Id.*, [0055]. Memory 350 stores “operating system 352,” including “instructions for handling basic system services and for performing hardware dependent tasks.” *Id.*; USAA-1003, ¶126.

Memory 350 stores various types of instructions providing device functionality, such as “graphic user interface processing,” “sensor-related processing and functions,” “phone-related processes and functions,” “electronic-messaging related processes,” “media processing-related processes,” “navigation-related processes and instructions,” “camera-related processes and functions,” “other processes and functions.” USAA-1028, [0056]. Given such non-limiting disclosures of storing data relating to different types of device functionality, a POSITA would have understood and found obvious to configure memory of the device to store raw sensor data (accelerometer data, position data) and data generated from evaluating the raw sensor data (e.g., unsafe driving behaviors).

USAA-1003, ¶127.

**[1.6]**

The Forstall-Rabu-Langle2009-Warren device runs a navigation application to “provide directions from a point of origin to a destination” and “display[] a current position on a map as well as deliver navigation instructions based on the current position to route a user to a desired destination.” USAA-1028, [0004]. As discussed below, the Forstall-Rabu-Langle2009-Warren device meets each of the requirements imposed by [1.6] of the configuration of a “mobile telecommunications device” to determine a “start of a driving period” identified in §I.C. USAA-1003, ¶¶131-132.

The start of a navigation period (“*start of a driving period*”) is determined based on a user’s interaction with map display 500 (“*inputs received by the user interface*”), for example, when a user specifies a “desired destination” (destination 506) for the map display 500 to “provide directions from a point of origin to [the] destination[.]” USAA-1028, [0004], [0072]; USAA-1003, ¶133. A user also interacts with objects displayed on a top-level interface graphical of the device to access the user interfaces specifically provided by the navigation application (e.g., map display 500). USAA-1028, [0042].

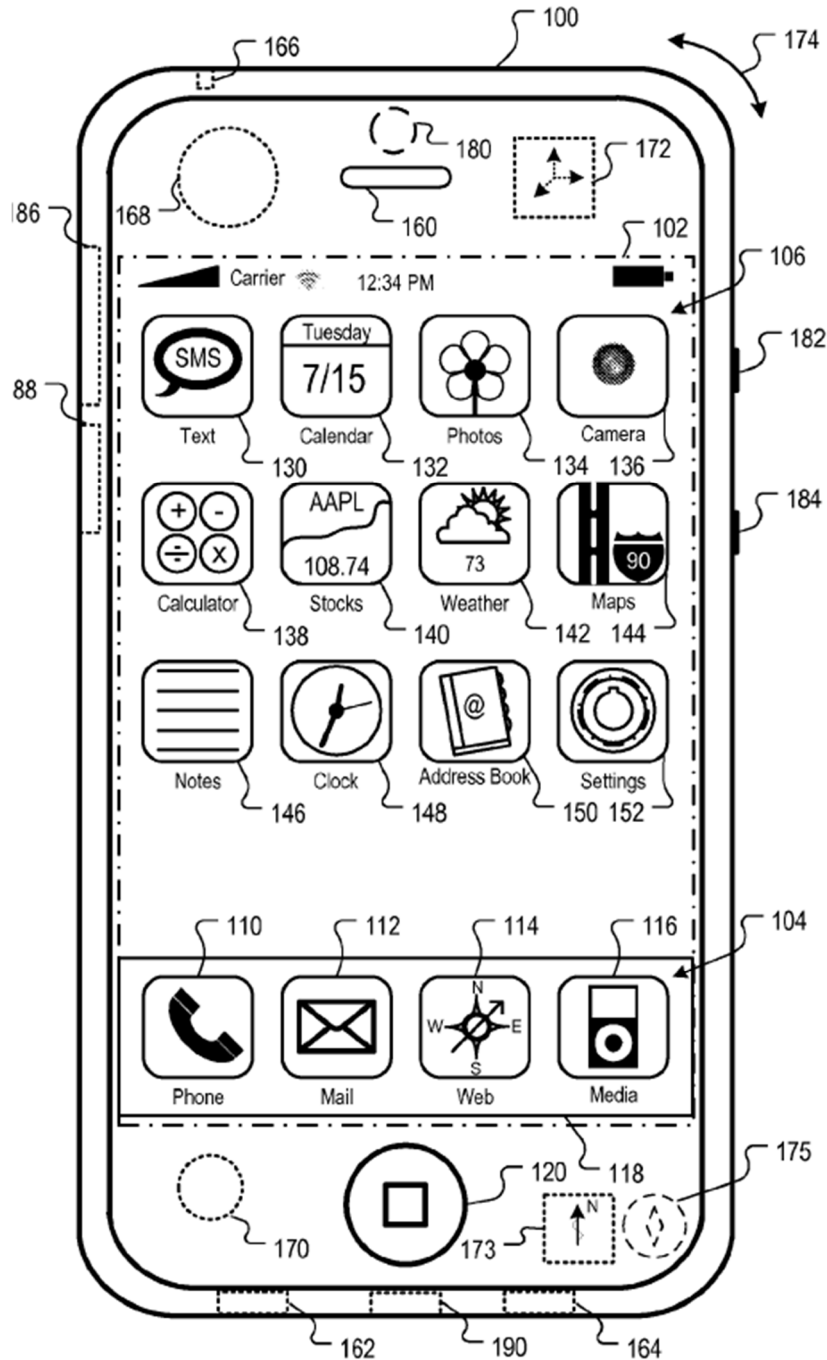
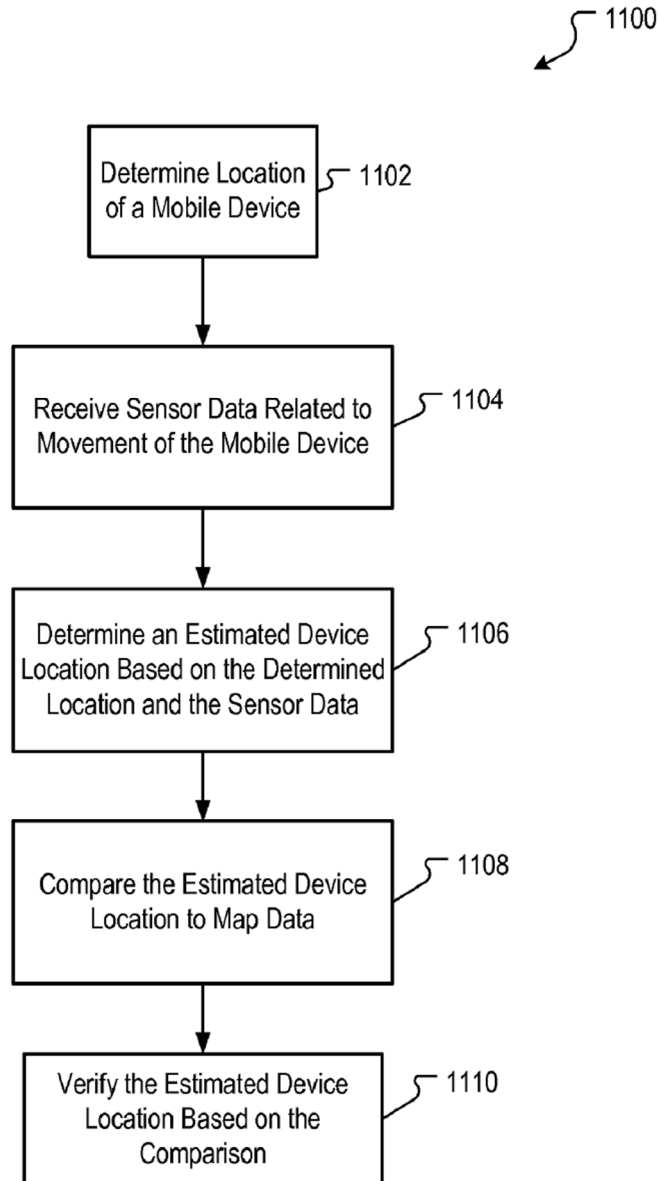


FIG. 1

USAA-1028, Fig. 1

The start of a navigation period (“*start of a driving period*”) is determined based on data collected by integrated sensors (“*sensor data from the device’s*”

*sensor set*”), e.g., when the device determines an estimated device location to set for the “point of origin” (origin 502). USAA-1028, [0072], [0082]. In Figure 11 (below), the estimated device location is determined based on sensor data received from “accelerometer 172, compass 173, gyroscope 175,” and by, for example, “performing dead reckoning calculations using the received sensor data to measure movements of the mobile device from the determined location.” *Id.*, [0073], [0082]. USAA-1003, ¶134.



USAA-1028, Fig. 11

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

*sensor set*”). USAA-1003, ¶135; USAA-1028, [0004], [0042], [0072], [0073], [0082], [0083].

Moreover, based on Forstall-Rabu-Langle2009-Warren, it would have been obvious to a POSITA to provide a device that is “mounted in a vehicle” using an “automobile dock” or “vehicle holder,” and thus, is “*removably attached to the vehicle*” prior to and/or during a navigation period where a vehicle is traveling along a navigation path (“*the vehicle is in use*”). USAA-1013, 3:11-45, Figs. 1, 2; USAA-1003, ¶136. As discussed in §III.E.1(d)(i), this would have improved the transitioning of operational modes (walking mode, vehicle mode) by detecting a “dock status” indicating attachment to “automobile dock” or “vehicle holder” (as taught in Rabu). USAA-1003, ¶136; USAA-1028, [0064], [0065], [0068], [0070], [0071]; USAA-1013, 3:1-10, 4:21-33, 8:13-10:42, Figs. 1, 4, 5, 7, 8.

#### [1.7]

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

USAA-1029, 1-3; Figs. 2, 4. Further, a POSITA would have found obvious that the driving safety data is derived from sensor data since Langle2009 describes analyzing information specified by the sensor data (e.g., acceleration values, lane change indicators) to “classify safe versus unsafe driving.” USAA-1029; Abstract; USAA-1003, ¶137.

**[1.8]**

As discussed for [1.2], a memory of Forstall-Rabu-Langle2009-Warren device (e.g., memory 350) stores driving safety data (“***store a selection of the driving information to the memory***”). USAA-1003, ¶138; USAA-1029, 507; USAA-1028, [0055], [0056]. From Forstall, a POSITA would have found it obvious to store all or a subset of the derived driving information in the memory of the Forstall-Rabu-Langle2009-Warren device, and thus, to store a selection of the driving information to the memory. USAA-1003, ¶138. Notably, the plain meaning of a “selection of the driving information” is not limited to a selection of a subset of the same, but instead is broad enough to encompass selection of some or all of that information.

Still, to the extent that this limitation is narrowly interpreted to require a selection of less than all for storage, a POSITA would have found obvious to store in the Forstall-Rabu-Langle2009-Warren device a subset of (i.e., selection of) the recorded sensor data since, e.g., Forstall explains storage of various types of data,

indicating that specific types of recorded data are more useful for storage than others. USAA-1003, ¶139; USAA-1028, [0055], [0056]; USAA-1015, 233-250.

**[1.9]**

As discussed for [1.7], it would have been obvious to a POSITA to determine driving safety data (“***driving information***”) based on evaluating sensor data collected by integrated sensors (accelerometer 172, compass 173, gyroscope 175). USAA-1028, [0036], [0045], [0061]; USAA-1003, ¶140. Since Forstall and Langle2009 each teach data collection and processing techniques using only data from smartphone sensors, it would have been obvious to derive driving safety data “***without data from vehicle sensors.***” *Id.*, [0006], [0007], [0061]; USAA-1029, 1-2; USAA-1003, ¶140 (citing USAA-1031, [0010]).

**[1.10]**

Forstall describes examples of display objects used to access applications on a device and further describes that the device “may download additional applications or other software that provides other functions and corresponding display objects.” USAA-1028, [0033]. Based on this, a POSITA would have understood that the navigation application is downloaded by the Forstall-Rabu-Langle2009-Warren device, and thus, a “***downloaded application.***” USAA-1028, [0042], Fig. 5; USAA-1003, ¶141. As discussed in §III.A.1(a), the navigation application monitors location information on the Forstall-Rabu-Langle2009-

Warren device such that the device is “**controlled**” by the navigation application while a user accesses map data. *Id.*, [0030]-[0033], [0042]; USAA-1003, ¶141.

Further, as discussed in §III.A.1(e), a POSITA would have configured the device to determine a driver score based on the driving safety data (“**driver score associated with a particular driver**”). USAA-1029; USAA-1030. As described in Warren, the driver score reflects “a qualitative view of the driving characteristics for a particular vehicle or a combination of a vehicle and driver[,]” such as “a risk level associated with insuring a particular driver[.]” USAA-1029, [0024]. The driver score can be based on “speeds at which the vehicle is operated.” *Id.*, [0014]. A POSITA would have understood that Langle2009’s driving safety data relates to risks associated with driving, and thus, found it obvious to configure device 100 to compute the driver score based on processing information represented by the driving safety data (e.g., unsafe acceleration, unsafe braking) (“**process the driving information to generate a driving score associated with a particular driver**”). USAA-1003, ¶142; USAA-1029, 502-503; USAA-1030, [0014], [0024]. For example, Warren teaches embodiments where the driver score “include[s] a variety of parameters with various weights applied to the parameters[.]” and a POSITA would have found it obvious that to determine parameter weights based on identifying unsafe driving behaviors from sensor data (as taught in Langle2009). USAA-1030, [0051]; USAA-1003, ¶142.

### 3. Claims 21, 46, 51, 54

Forstall-Rabu-Langle2009-Warren renders these claims obvious in the same manner as explained above for the corresponding claim 1 limitations listed in the table below. USAA-1003, ¶143.

| <b>Claim 1 Limitation</b> | <b>Corresponding Limitations</b> |
|---------------------------|----------------------------------|
| [1.1] <sup>7</sup>        | [21.1], [46.1], [51.1], [54.1]   |
| [1.2]                     | [21.3], [46.2], [51.3], [54.2]   |
| [1.3]                     | [46.3], [54.3]                   |
| [1.4]                     | [21.4], [46.4], [51.4], [54.4]   |
| [1.5]                     | [21.4], [46.5], [51.5], [54.5]   |
| [1.6] <sup>8</sup>        | [21.6], [46.6], [51.6], [54.6]   |
| [1.7]                     | [21.7], [46.7], [51.7], [54.7]   |
| [1.8]                     | [21.8], [46.8], [51.8], [54.8]   |
| [1.9]                     | [21.10], [46.9], [51.10], [54.9] |

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<sup>7</sup> Preambles [1.1] and [54.1] describe a “mobile telecommunications device,” while preambles [21.1] and [51.1] describe a “non-transitory computer readable medium.” While none of the preambles are limiting, the Curry-Rabu combination renders them obvious, as discussed in Sections III.A.2 ([1.1], [54.1]) and III.A.3 ([21.1], [51.1]). USAA-1003, ¶143.

<sup>8</sup> Limitation [54.6] differs from limitation [1.6] by a single word (“affixed” in [54.6] compared to “attached” in [1.6]). The ’879 patent specification does not distinguish the two terms “affix” versus “attach.” USAA-1003, ¶143.

| Claim 1<br>Limitation | Corresponding Limitations        |
|-----------------------|----------------------------------|
| [1.10]                | [21.9], [46.12], [51.9], [54.10] |

**[21.1]/[51.1]**

As discussed for [1.5], the Forstall-Rabu-Langle2009-Warren device includes memory that stores, for example, “operating system 352,” including “instructions for handling basic system services and for performing hardware dependent tasks.” USAA-1028, [0006]. Forstall also describes that the memory stores various types of instructions providing device functionality, thereby rendering obvious that the memory is a “*non-transitory computer readable medium having instructions comprising a software application stored thereon.*” USAA-1028, [0056]; USAA-1003, ¶144.

**[21.2a]/[51.2a]**

The Forstall-Rabu-Langle2009-Warren device includes “touch-sensitive display 102” (“*display*”) that can be implemented using “liquid crystal display (LCD) technology” or light emitting polymer display (LPD) technology” and is “sensitive to haptic and/or tactile contact with a user.” USAA-1028, [0025]-[0027]; USAA-1003, ¶145.

**[21.2b]/[51.2b]**

As discussed for [1.3] and [21.2a], the Forstall-Rabu-Langle2009-Warren device “display[s] one or more graphical user interfaces on [a] touch-sensitive

display 102 for providing the user access to various system objects and for conveying information to the user.” USAA-1028, [0027]. A POSITA would have understood and found it obvious that the display “*present[s]*” the one or more graphical interfaces on display 102. *Id.*, [0025]-[0027]; USAA-1003, ¶146.

**[46.10]**

As previously discussed (§III.A.1(a), and for [1.2], [1.7]), the Forstall-Rabulange2009-Warren device processes accelerometer readings (“*sensor data*”) using “vehicle dead reckoning” to detect vehicle accelerations in a positive axial direction (“*vehicle acceleration events*”) and vehicle accelerations in a negative axial direction (“*vehicle braking events*”). USAA-1028, [0062], [0063], [0070], [0081], [0082]. Specifically, when in “vehicle mode,” the device applies a “vehicle dead reckoning mode [that] uses an accelerometer reading to determine how the device is positioned relative to gravity.” USAA-1028, [0070]. Further, “[a]ccelerations along the axes perpendicular to the detected gravity axis” are used to identify “accelerations that contribute to displacement of the vehicle from a known fix to a second position to be measured via dead reckoning and displayed on a map.” *Id.*; USAA-1003, ¶147.

Moreover, the combination discussed in §III.A.1(e) renders this limitation obvious since Langle2009 teaches processing accelerometer measurements (“*sensor data*”) to detect driving safety data, including unsafe acceleration

(“*vehicle acceleration events*”) and unsafe braking (“*vehicle braking events*”).

USAA-1029, 502-504, Figs. 2, 3. Specifically, “a change in the vehicle’s speed is measured along the x axis[,]” where “acceleration” is “an increase in speed” and “deceleration” is “a decrease in speed.” *Id.*, 502-503; USAA-1003, ¶148.

**[46.11]/[51.11]**

As discussed for [1.7], Langle2009 describes evaluating accelerometer measurements) to identify safe and unsafe driving behaviors. USAA-1029, 502. A POSITA would have understood that this identification is based on classifying detected driving behaviors (e.g., acceleration, braking) as “safe” and “unsafe” driving behaviors and found obvious that an example of classification technique is using measured acceleration values (“*predefined threshold values*”) to differentiate the two types of driving behaviors. USAA-1003, ¶149. For example, as shown in Fig. 1 (below), “safe acceleration and deceleration never reaches more than 0.3 g in either the positive or negative direction.” USAA-1029, 503.

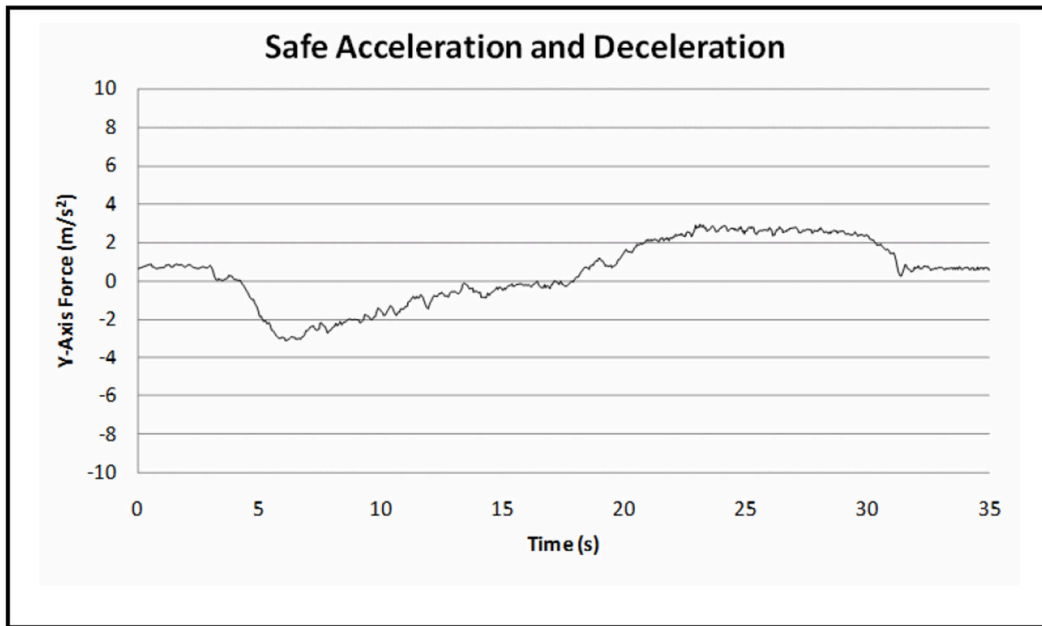


Figure 1. Safe Acceleration and Deceleration

USAA-1029, Fig. 1

In contrast, in Fig. 2 (below), the acceleration measurements have “the same overall shape” but have “a slightly higher G-force of 0.43 g on this incline.” *Id.* From these examples, unsafe acceleration is determined when measured acceleration exceeds a threshold value of 0.3 g. USAA-1003, ¶150. As another example, in Fig. 5 (below), acceleration measurements have “a G-force of well over 0.5 g in the x direction[,]” which indicates an unsafe lane change. USAA-1029, 504. In this example, the unsafe lane change is determined when measured acceleration in the x direction exceeds a threshold parameter value of 0.5 g. USAA-1003, ¶150.

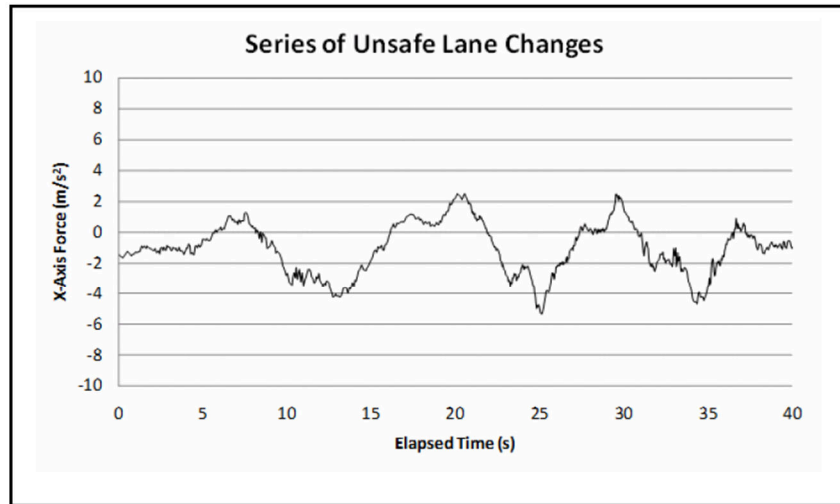


Figure 5. A Series of Unsafe Lane Changes

USAA-1029, Fig. 5

**4. Claims 2, 3, 5, 8, 11-13, 19, 20, 41, 42, 45**

**[2]**

As discussed for [1.7] and [1.10], in the combination (*see* III.A.1(e)), a POSITA would have configured the device to classify driving behaviors based on sensor data, such as unsafe acceleration and unsafe breaking. USAA-1029, 502. A POSITA would have understood detection of a driving behavior to represent “*detect occurrence of a predetermined event*” since the detected behaviors are among a finite number of predetermined classifications. *Id.*; USAA-1003, ¶151. Further, because Warren describes using weights to compute parameters for a driver score, a POSITA would have found it obvious that, in at least some configurations, detection of an unsafe driving behaviors results in adjusting a weight in computing the driver score (“*take at least one predetermined action*”).

USAA-1003, ¶151; USAA-1030, [0051].

[3]

As discussed for [1.5] and [1.8], in the combination (*see* §III.A.1(e)), a POSITA would have configured the device to store driving safety data (e.g., unsafe acceleration, unsafe braking) in memory (“***storing driving information...to the memory***”). USAA-1028, [0055], [0056]; USAA-1029, 507. Because stored driving safety data is evaluated to identify an unsafe acceleration (detect occurrence of an “***event***”), the stored driving safety data is ***associated with that event.***” USAA-1003, ¶152.

[5]

Warren discloses a central system 170 (“***remote system***”) that receives data collected and/or generated for a monitored vehicle. USAA-1030, [0021]. Warren describes monitored data to central system 170 for processing (“transmitting driving information...to a remote system”). A vehicle monitor “periodically transmit[s] collected data to the central system 170[,]” using “wireless technology,” such as “FLEX, REFLEX, POCSAG, AMPS, NAMPS, TDMA, CDMA, GSM, GPRS...” *Id.*, [0022]. Forstall describes a device including “one or more wireless communication subsystems” (“***wireless telecommunications module***”), including “802.11b/g communication device 186, and/or a Bluetooth™ communication device 188.” USAA-1028, [0038]. Thus, in the combination (*see*

§III.A.1(e)), a POSITA would have configured the device to provide driving safety data to central system 170 using one or more wireless communication subsystems (*“transmitting driving information via a wireless telecommunication module of the mobile telecommunication device”*). USAA-1003, ¶153.

**[8.1]**

As discussed for [2] and [5], in the combination (*see* §III.A.1(e)), a POSITA would have configured the device to detect an unsafe acceleration from driving safety data (detect an *“event”*) and provided the driving safety data to central system 170 (*“communicating to a remote system that an event has been detected”*). USAA-1003, ¶154; USAA-1029, 502; USAA-1030, [0022], [0038], [0051].

**[8.2]**

In the combination (*see* III.A.1(e)), a POSITA would have configured the device to receive a request from Warren’s central system 170 to transmit driving safety data (*“request to transmit to the remote system selected portions of the driving information associated with the detected event”*). USAA-1003, ¶155; USAA-1030, [0022], [0023]. Further, “the communication protocol between a mobile device and an associated server was an obvious design choice by the Critical Date because systems that enabled various types of communication between devices were well-known by the Critical Date.” USAA-1003, ¶155

(citing USAA-1041, USAA-1045).

**[11]**

The Forstall-Rabu-Langle2009-Warren device can be “cellular telephone” or a “smartphone” and “can place and receive phone calls (e.g., using VoIP protocols)[.]” USAA-1028, [0024], [0040]. Based on these disclosures, a POSITA would have recognized certain scenarios where the device receives an incoming phone call while the mobile navigation application (“***downloaded application***”) is used for navigation (“***driving period***”). USAA-1003, ¶156; USAA-1028, [0024], [0040]. For such instances, a POSITA would have looked to disclosure that memory of phone 100 includes “graphical user interface instruction 356 to facilitate graphic user interface processing” and “phone instructions 360 to facilitate phone-related processes and functions[.]” USAA-1028, [0056]. From these disclosures, a POSITA would configured the navigation application to display information relating to the incoming phone call and thereby “***manage voice-calls incoming to the mobile telecommunications device during a driving period.***” *Id.*; USAA-1003, ¶156.

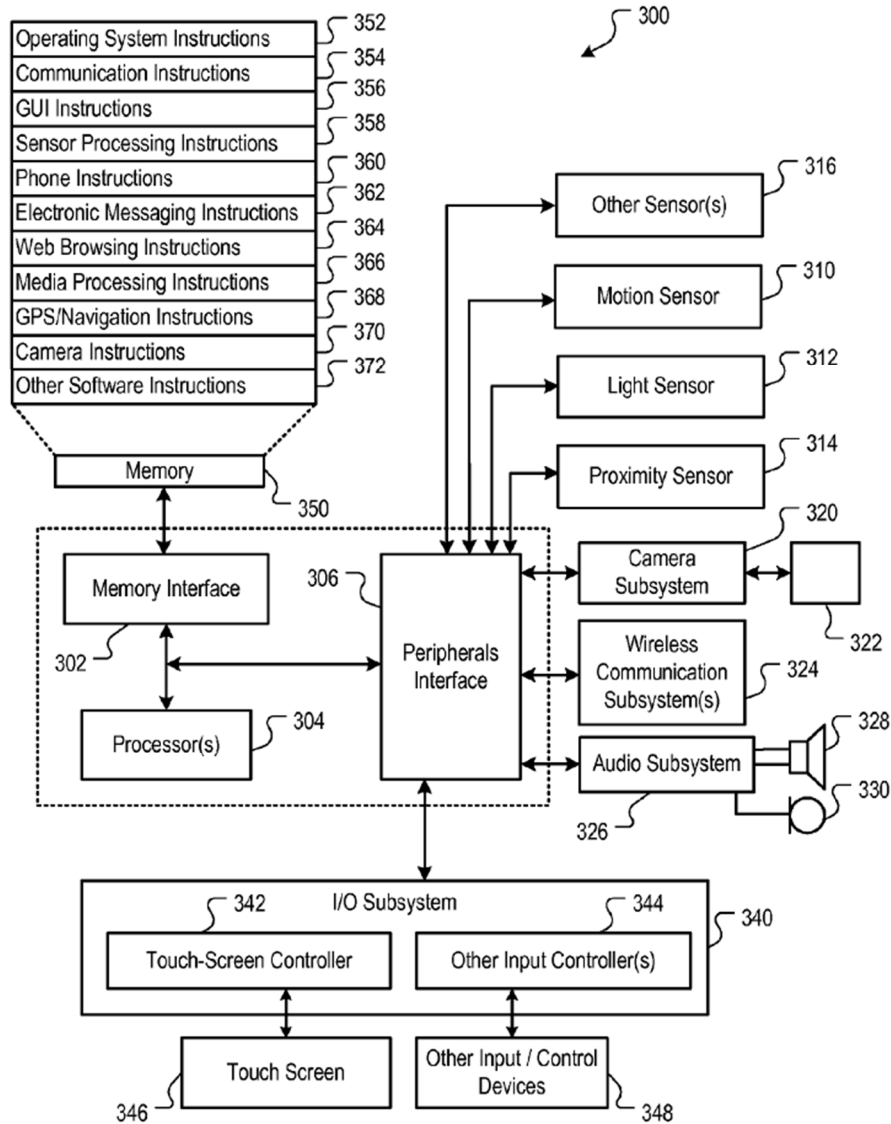
**[12]**

The Forstall-Rabu-Langle2009-Warren device can include “a loudspeaker 164” to “facilitate hands-free voice functionalities, such as speaker phone functions.” USAA-1028, [0034]. A POSITA would have found it obvious to

configure the device to enable hands-free voice functionality while the navigation application is being used for navigation (“*driving period*”) since a user is occupied driving a vehicle and is unable to fully interact with the device. USAA-1003, ¶157. One obvious configuration is that the navigation application controls the device to enable hands-free functionality upon detecting a start of navigation (“*enable a hands-free mode of operation on detection of the driving period*”) since the use of hand-free functions to increase user safety while using mobile navigation systems were well-known by the Critical Date. *Id.* (citing USAA-1003, Abstract, 1:45-50).

**[13]**

As discussed for [12], the Forstall-Rabu-Langle2009-Warren device “facilitate[s] hands-free voice functionalities, such as speaker phone functions.” USAA-1028, [0034]. In an exemplary implementation (shown in Fig. 3 below), the device includes “audio subsystem 326,” “speaker 328,” and “microphone 330[,]” which collectively “facilitate voice-enabled functions, such as voice recognition, voice replication, digital recording, and telephony functions.” *Id.*, [0050]. Because the device provides voice recognition capabilities, the Forstall-Rabu-Langle2009-Warren device “*enable[s] voice-activated commands*” through microphone 300. USAA-1003, ¶158.



USAA-1028, Fig. 3

[19]

The Forstall-Rabu-Langle2009-Warren device can be “cellular telephone” or a “smartphone” and “can place and receive phone calls (e.g., using VoIP protocols)[.]” USAA-1028, [0024], [0040]. A POSITA would have understood and found obvious that the device includes a battery as a power source (“*utilizes its*

*own power supply*”) since cellphones and smartphones were known by the Critical Date to include batteries. USAA-1003, ¶159 (citing USAA-1039, 2; USAA-1040, 32-34).

**[20]**

As discussed for [1.1], the Forstall-Rabu-Langle2009-Warren device can be a “smartphone” and “can place and receive phone calls (e.g., using VoIP protocols)[.]” USAA-1028, [0024], [0040]; USAA-1003, ¶160.

**[41]**

As discussed for [1.7], the Forstall-Rabu-Langle2009-Warren device uses “[s]ensor data from accelerometers, a compass, gyroscopes, and impact sensors” to “measure the movement of the device...” USAA-1028, [0062]. The device also “detects an axis of periodic sudden accelerations using the accelerometer 172...” *Id.*, [0071]. Further, “[i]n the vehicle mode, sudden accelerations in a positive or negative direction” are also measured along several axes using accelerometer 172. A POSITA would have therefore configured the device to detect both sudden accelerations in the positive direction (“*vehicle acceleration events*”) and sudden accelerations in the negative direction (“*vehicle braking events*”). USAA-1003, ¶161. A POSITA would have also configured the device to detect driving safety data from accelerometer measurements, including both safe/unsafe accelerations (“*vehicle acceleration events*”) and safe/unsafe braking (“*vehicle braking*

*events*”). *Id.*; USAA-1029, 502-504.

**[42.1]**

As previously discussed, Forstall and Langle2009 each describe identifying a direction of travel by a vehicle using sensor data collected by a mobile device (e.g., accelerometer data, GPS data). USAA-1028, [0070], [0071], [0075], [0076]; USAA-1029, 502. Forstall describes that the sensor data can be processed to “determine a change of direction[]” (USAA-1028, [0070]), and similarly, Langle2009 describes using triaxial acceleration measurements to identify a “[c]hange in direction ([s]teering)” (USAA-1029, Table 1). According to Langle2009, “[u]sing this data, not only is it possible to count lane changes and detect when they occur, it is possible to classify safe and unsafe lane changes.” USAA-1029, 502. Thus, in the combination (*see* §III.A.1(e)), a POSITA would have configured the device to determine unsafe lane changes (“*determination of vehicle swerving events*”) from sensor data collected by integrated sensors. USAA-1003, ¶162.

**[42.2]**

As discussed for [1.7], Langle2009 describes evaluating sensor data (e.g., accelerometer measurements) to identify driving safety data indicating safe and unsafe driving behaviors. USAA-1029, 502. A POSITA would have found obvious that the classification of driving behaviors involves the use of “*preset*

*parameters*” to differentiate between “safe” and “unsafe” driving behaviors.

USAA-1003, ¶163. For example, as shown in Fig. 1 (below), “safe acceleration and deceleration never reaches more than 0.3 g in either the positive or negative direction.” USAA-1029, 503.

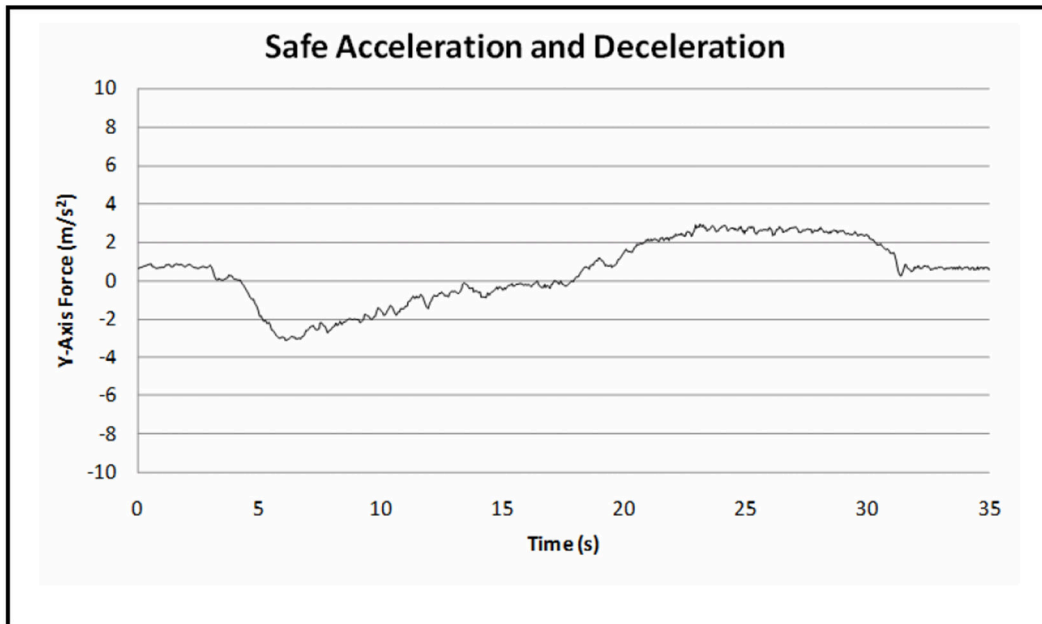


Figure 1. Safe Acceleration and Deceleration

USAA-1029, Fig. 1

In contrast, in Fig. 2 (below), the acceleration measurements have “the same overall shape” but have “a slightly higher G-force of 0.43 g on this incline.” *Id.* From these examples, unsafe acceleration is determined (“*determination of such events occurs*”) when measured acceleration exceeds a threshold parameter value of 0.3 g (“*when data from the sensor set accords with preset parameters*”).

USAA-1003, ¶164. As another example, in Fig. 5 (below), acceleration

measurements have “a G-force of well over 0.5 g in the x direction[,],” which indicates an unsafe lane change. USAA-1029, 504. In this example, the unsafe lane change is determined (“*determination of such events occurs*”) when measured acceleration in the x direction exceeds a threshold parameter value of 0.5 g (“*when data from the sensor set accords with preset parameters*”). USAA-1003, ¶164.

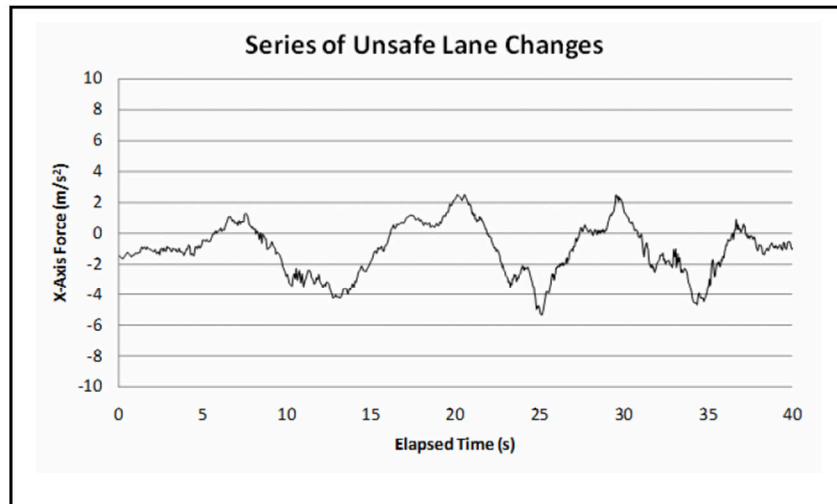


Figure 5. A Series of Unsafe Lane Changes

USAA-1029, Fig. 5

## 5. Additional Claims

These claims are obvious in the same manner as explained above for the corresponding claims listed in the table below. USAA-1003, ¶165.

| Claim Limitation | Corresponding Limitations |
|------------------|---------------------------|
| [2]              | [22]                      |
| [3]              | [23]                      |

| Claim Limitation  | Corresponding Limitations    |
|-------------------|------------------------------|
| [5]               | [25]                         |
| [8.1]-[8.2]       | [28.1]-[28.2]                |
| [11]              | [29]                         |
| [12]              | [30]                         |
| [13]              | [31]                         |
| [19]              | [39]                         |
| [20]              | [40]                         |
| [42]              | [44], [47], [49], [52]       |
| [45.1]-[45.2]     | [50.1]-[50.2], [53.1]-[53.2] |
| [41] <sup>9</sup> | [43], [48]                   |

**B. [GROUND 1B] – Forstall-Rabu-Langle2009-Warren-Tamir Renders Claims 4 and 24 Obvious**

**1. Forstall-Rabu-Langle2009-Warren-Tamir**

(a) *Tamir*

Tamir is focused on a traffic information system that evaluates driver behavior in a vehicle. USAA-1006, Abstract. It discloses a data collection

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<sup>9</sup> Claims 43 and 48 require determinations of “both” of “vehicle acceleration events” and “vehicle braking events,” while claim 41 requires determinations of “at least one of” these features. As explained for [41], the Curry-Rabu combination renders even the narrower requirements of claims 43 and 48 obvious. USAA-1003, ¶165.

technique in which “samples are collected at a dynamically adjusted rate[,]” by determining sampling rate “according to the location of the driving...” *Id.*, 9:10-20. For example, data collection can involve “accumulating more samples at areas where there are many accidents or near intersections.” *Id.* The sampling rate can also be adjusted according to “the time of day, date, and/or external conditions, such as weather conditions,” and “the driving behavior of the vehicle,” e.g., “increasing the sampling rate when reckless driving is identified.” *Id.*; *see id.*, 20:52-21:11; USAA-1003, ¶83.

(b) *Proposed Combination*

As discussed in the previous section, Tamir discloses an exemplary data collection technique where a sampling rate is adjusted based on conditions associated with data collection (e.g., location of driving, driving behavior). USAA-1006, 9:10-20, 20:52-21:11. A POSITA would have recognized that incorporating Tamir’s data collection technique into the Forstall-Rabu-Langle2009-Warren combination would have improved motion recording by, for example, allowing “lower power consumption and less wear and tear of” phone 100. USAA-1006, 20:52-21:2. Moreover, “dynamic sampling rates were conventional by the Critical Date and known to provide several advantages to data processing in vehicle monitoring systems, such as maintaining measurement precision, high adaptation to different driving conditions, and increased

responsiveness.” USAA-1003, ¶166 (citing USAA-1017, 5:61-6:9, 9:3-7; USAA-1018, [0019]; USAA-1019, 5:1-3).

## 2. Claims 4, 24

[4]/[24]

As discussed in §III.B.1(b), a POSITA would have configured the Forstall-Rabu-Langle2009-Warren-Tamir device to use Tamir’s data collection technique to use variable sampling rates and improve Forstall’s data recording technique. USAA-1006, 9:10-20, 20:52-21:11. Tamir describes that “the sampling rate is adjusted according to the driving pattern of vehicle 15” and that “when it is determined that the driver is driving relatively daringly, a higher sampling rate is used.” *Id.*, 20:52-21:2. Tamir also contemplates adjusting data collection “at special occasions, such as when an accident is possible.” *Id.* A POSITA would have therefore found it obvious to configure the device to detect an unsafe driving behavior (“*and event*”) using a higher sampling rate for data collection relative to other scenarios (“*driving information captured at a higher sampling rate than when an event is not detected*”). USAA-1003, ¶167.

### C. [GROUND 1C] – Forstall-Rabu-Langle2009-Warren-Balachandran Renders Claims 6, 7, 16, 26, 27, and 34 Obvious

#### 1. Forstall-Rabu-Langle2009-Warren-Balachandran

##### (a) *Balachandran*

Balachandran describes an emergency response technique focused on

“enabling emergency call initiations in response to the detection of a vehicle accident.” USAA-1007, Abstract. This involves an activation signal transmitted between vehicle sensors that detect an accident and a cellular telephone used for an emergency call. *Id.*, 1:34-47. The emergency call activation signal “activates a timer for delaying initiation of an outgoing call to an emergency number, such as 911.” *Id.* Once the timer expires, the cellphone “initiates an emergency call setup to the mobile switching center servicing the telephone unit.” *Id.*, 1:48-67. Further, the cellphone can provide “[a]n audio or visual indication [that] notifies the passengers of activation [a] timer 35 and ceases with expiration or cutoff of the timer.” *Id.*, 2:46-63; USAA-1003, ¶84.

(b) *Proposed Combination*

Balachandran discloses an exemplary technique where emergency call is initiated by a cellphone in response to detection of a vehicle accident. USAA-1006, Abstract. A POSITA would have been motivated to incorporate this feature into the Forstall-Rabu-Langle2009-Warren combination and thereby enable the device to prevent casualties resulting from a vehicle accident. USAA-1003, ¶168.

Balachandran’s emergency response technique would have advanced Langle2009’s overall motivation to reduce casualties resulting from vehicular accidents. USAA-1003, ¶169. For example, the combination would have enabled phone 100 to provide life-saving capabilities by enabling a mechanism for user to

seek emergency response service when a vehicle accident occurs while a user is travel along a navigation route. *Id.* Further, because Langle2009 describes that a cellphone is capable of communicating and/or sharing safety evaluation data with other external systems, a POSITA would have perceived configuring phone 100 to incorporate Balachandran's emergency response techniques as an implementation detail. USAA-1029, Abstract ("mobile phones may be used to aid in safe driving practices and detection of emergencies"); USAA-1003, ¶169. A POSITA would have had a reasonable success in implementing the combination without invention since "several vehicle monitoring systems by the Critical Date were similarly capable of providing emergency response techniques." USAA-1003, ¶169 (citing USAA-1021, USAA-1022, USAA-1023).

## **2. Claims 6, 7, 16, 34**

### **[6.1]**

Balachandran describes sensors that detect an accident ("*event [that] has been detected*"). USAA-1007, 2:16-27, 4:5-21. Upon detecting an accident, Balachandran's emergency response technique involves an emergency call activation signal being transmitted to a cellphone, which initiates an emergency call after a timeout period specified by timer 35 has expired. *Id.*, Abstract, 2:46-3:6. Notifications relating to timer 35 are used to indicate an accident has been detected since the timer 35 is specifically used to initiate an emergency call

relating to a detected accident. USAA-1003, ¶170. Thus, a POSITA would have found it obvious that the Forstall-Rabu-Langle2009-Warren-Balachandran device provides an audio or visual output to indicate that an accident has been detected (“*providing feedback to a user*”). *Id.* Further, in some instances, an accident is detected (and an audible or visual notification of the detected accident is provided) in response to device identifying an unsafe driving behavior (“*occurrence of a predetermined event*”). *Id.*, ¶170 (citing USAA-1029, 1).

A POSITA would have also found it obvious to configure the Forstall-Rabu-Langle2009-Warren-Balachandran device provide visual notifications relating to accident detection since the device provided by the combination already includes a touch screen (as discussed for [1.1] and [1.3]). USAA-1003, ¶171; USAA-1028, [0051]. Balachandran describes an interface 45 enabling a user to interact with a cellphone after detection of an accident and a POSITA would have recognized that touch screens were ubiquitous for enabling device-user interaction in mobile device-based accident systems by the Critical Date. USAA-1007, 2:64-3:6; USAA-1003, ¶171 (citing USAA-1008, 32-34). A POSITA would have therefore found it obvious to implement interface 45 as a visual interface and enable user interaction (e.g., interactive notifications) through a touch screen of the device provided by the combination. *Id.*; USAA-1028, [0051]-[0053].

**[6.2]**

As discussed for [7.1], in the device provided by the combination, a POSITA would have found it obvious to implement interface 45 as a visual interface to enable user interaction (e.g., interactive notifications) through a touch screen. USAA-1007, 2:64-3:6; USAA-1028, [0051]-[0053]; USAA-1003, ¶172 (citing USAA-1008, 32-34). A POSITA would have found it obvious that such user interaction involves a user providing input relating to a detected accident (“*receive a user interaction to...deny whether the detected event has actually occurred following said feedback*”) since touch screens were ubiquitous for enabling device-user interaction in mobile device-based accident systems by the Critical Date. USAA-1003, ¶172. Further, Balachandran teaches that a cellphone is capable of providing a “*visual indication* [that] notifies the passengers of activation of timer” relating to a detected accident. USAA-1003, ¶172; USAA-1007, 2:16-63, 4:5-21.

**[7.1]**

As discussed for [6.1], the Forstall-Rabu-Langle2009-Warren-Balachandran device would have provided an audio or visual indication upon accident detection. USAA-1007, 2:46-63. A POSITA would have also found it obvious to implement interface 45 in the device as a visual interface and enable user interaction (e.g., interactive notifications) through a touch screen. USAA-1003, ¶173; USAA-1028,

[0051]-[0053]. Thus, the device would have notified a user that an emergency call has been scheduled (“*further action [that] has been scheduled*”) after a time period specified by a timer (the action “*will be taken with a predetermined period*”). USAA-1003, ¶173.

**[7.2]**

As discussed for [7.1], the device provided by the combination would have received a user abort command relating to an emergency call. USAA-1006, 2:64-3:6, 4:22-31. A POSITA would have also found it obvious to implement interface 45 in the device as a visual interface and enable user interaction (e.g., interactive notifications) through a touch screen of the device. USAA-1003, ¶174; USAA-1028, [0051]-[0053]. Thus, the device provided by the combination would have received a user abort command (“*user interaction...to deny whether the further action should be taken*”) relating to an emergency call to be initiated (the action “*will be taken with a predetermined period*”). USAA-1003, ¶174.

**[16]/[34]**

As discussed for [6.1] and [6.2], Balachandran describes initiating a timeout period upon detecting an accident and allowing a user to interact with a cellphone via interface 45 during the timeout period. USAA-1007, 2:16-27. The cellphone provides “[a]n audio or visual indication [that] notifies the passengers of activation of [a] timer 35 and ceases with expiration or cutoff of the timer.” *Id.*, 2:46-63.

During the timeout period, the user can “cancel initiation of an emergency call...if no emergency assistance is required.” *Id.*, 2:16-27, 4:5-21. Since cancellation is initiated by the user via interface 45, a POSITA would have found it obvious that interface 45 “*provid[es] the user with [an] option[] to control the mobile device to take further action[]*” (e.g., configuring the cellphone to end timer 35 and cancel initiation of an automated emergency call). USAA-1003, ¶175.

A POSITA would have also found it obvious to configure the Forstall-Rabu-Langle2009-Warren-Balachandran device to provide a user with additional options, such as confirming, via interface 45, that an accident has occurred. *Id.* A POSITA would have found it obvious to configure interface 45 in the same manner to provide an option for the user to voluntarily confirm an accident. Such a configuration would have been advantageous as it would allow a cellphone to initiate an emergency call immediately and without requiring expiration of the timeout period, as described in Balachandran. *Id.* Similar configurations of accident detection systems were also well-known by the Critical Date. USAA-1003 ¶176 (citing USAA-1008, 32-34).

### **3. Claims 26, 27**

These claims are obvious in the same manner as explained above for the corresponding claims listed in the table below. USAA-1003, ¶177.

| Claim Limitation | Corresponding Limitations |
|------------------|---------------------------|
| [26.1]           | [6.1]                     |
| [26.2]           | [6.2]                     |
| [27.1]           | [7.1]                     |
| [27.2]           | [7.2]                     |

**D. [GROUND 1D] – Forstall-Rabu-Langle2009-Warren-Katayama Renders Claims 9, 10, 14, 15, 17, 18, 32, 33, 35-38 Obvious**

**1. Forstall-Rabu-Langle2009-Warren-Katayama**

**(a) *Katayama***

Katayama describes a “driving recorder” that records “situation data” that indicates the “surrounding situation or the like of a motor vehicle during a certain period before and after a time of an accident or...risk incident” in which “a driver...is close to [being] involved in an accident....” USAA-1024, [0001], [0011], [0058]; USAA-1003, ¶85.

Through “after-the-fact analysis” of recorded data, the recorder can for example determine provide insights into driving behavior that may have contributed to the occurrence of a given accident or “risk incident.” USAA-1024, [0001]-[0002]; USAA-1003, ¶86.

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

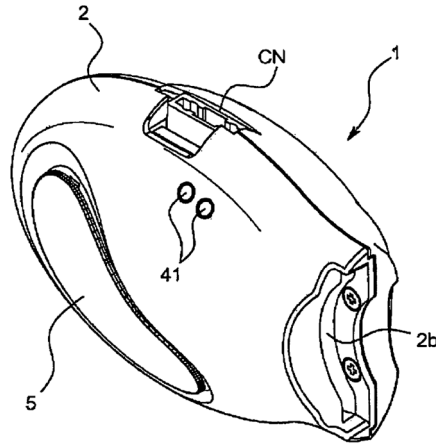


Fig.2

USAA-1024, Fig. 2

Recorder 1 detects occurrence of accidents and/or risk incidents based on “situation data” that includes both sensor data and information derived therefrom, including “acceleration data indicating acceleration applied to a vehicle, [and] position data indicating a position of the vehicle....” USAA-1024, [0013]; USAA-1003, ¶87.

As shown in Figure 5, the recorder “is controlled...by operating the CPU 81 in accordance with programs stored in a predetermined area of the internal memory 82.” USAA-1003, ¶88.

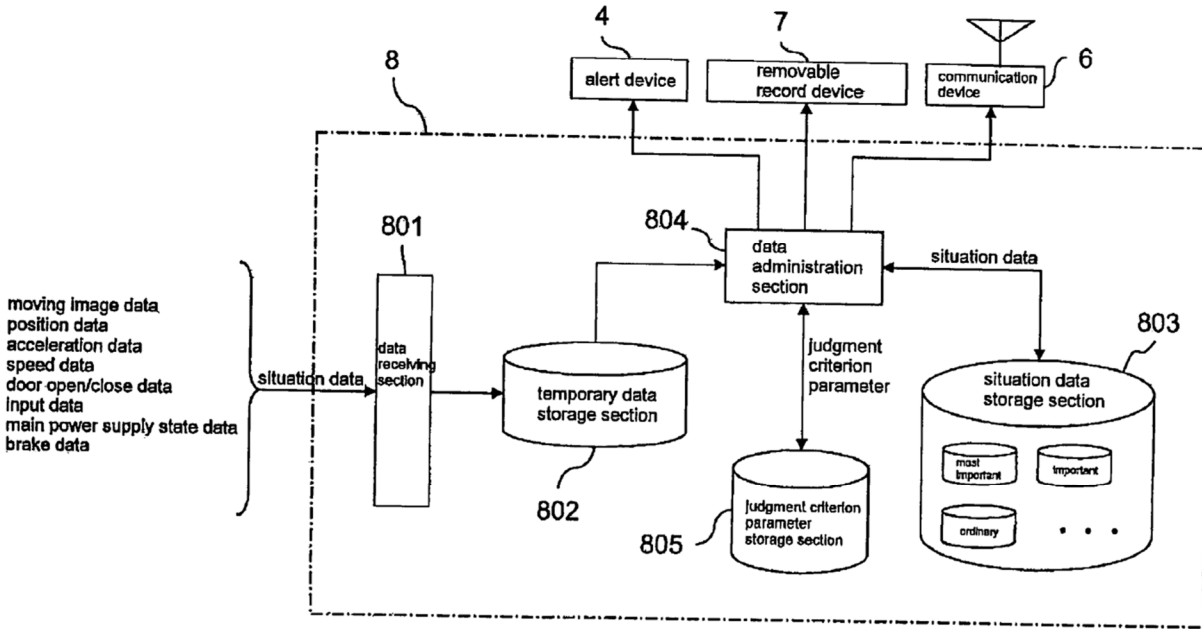


Fig.5

USAA-1024, Fig. 5

Memory 82 features an architecture with multiple sections, including “section 802” and “section 803.” *Id.*, [0044]. Relatedly, Katayama describes data handling techniques that enable “effective use” of the memory’s limited capacity, and ensure that “important data will not be erased,” but instead will remain available for easy and accurate “after-the-fact analysis” of accidents and/or risk incidents. *Id.*, [0016]; USAA-1003, ¶89.

In more detail, data receiving section 801 receives “situation data” including sensor data “at a constant sampling time one after another in a chronological order and writes the received situation data” in memory 82’s temporary data storage section 802. *Id.*; USAA-1003, ¶90. Due to that area’s limited capacity, “old data

is sequentially erased” and replaced over time with “new situation data.” USAA-1024, [0045], [0016]; USAA-1003, ¶90.

To avoid erasing situation data, section 804 determines at the “time of recording” whether temporarily stored situation data meets one or more predetermined criteria for long term storage. USAA-1024, [0001]-[0002], [0016], [0046]-[0050]; USAA-1003, ¶91. If so, the recorded situation data is, for example, classified with an identifier marking it as “important,” and then transferred with the identifier to long term “section 803.” *See* USAA-1024, [0001]-[0002], [0011]-[0016], [0027], [0046]-[0050], [0054], [0083]; USAA-1003, ¶91. In contrast, situation data that is marked with an identifier as less than important remains in temporary storage until eventually overwritten. *See* USAA-1024, [0011]-[0016], [0054]; USAA-1003, ¶¶91-93.

(a) *Proposed Combination*

A POSITA would have found it obvious to enhance the Forstall-Rabu-Langle2009-Warren device through implementation both of Katayama’s teachings on partitioning local memory into several sections (temporary, long term storage), and its related teachings on data handling, including both the comparison at the time of recording of digitalized sensor data against judgment criteria representative of specific driving behaviors, and storage in appropriate sections of memory of digitalized data with metadata identifiers indicating determinations made through

those comparisons. USAA-1024, [0012], [0015], [0039], [0048], [0049], [0075]; USAA-1003, ¶¶178-182.

Furthermore, a POSITA would have understood and found obvious that, like Katayama's local memory 82, the local memory featured in the Forstall-Rabu-Langle2009-Warren device, e.g., Forstall's "device 100" has limited capacity, accommodating continuously and sequentially received information including sensor data. *See* USAA-1028, [0055]-[0057]; USAA-1003, ¶183.

Forstall explains that "a device position is stored in memory[,]" along with "[s]ensor data [] received from a motion sensor measuring movement of the device." USAA-1028, [0006], [0075]. Forstall also describes processing of this data, for example, that "[a]n estimated current device location is determined[,]" based on "the device position, received sensor data, and an interpretation of the received sensor data as corresponding to movement along at least one pathway defined by the map data." *Id.*, [0006]. As discussed in §III.A.1(c), Langle2009 further describes techniques to "classify safe versus unsafe driving[]" using sensor data collected by a phone, such as "[braking] distance, acceleration, and deceleration[.]" USAA-1029, 1. A POSITA would have understood and found obvious that driving safety information derived from sensor data is stored locally in a memory on the Forstall-Rabu-Langle2009-Warren device for analysis. USAA-1003, ¶184; USAA-1029, 1 ("[u]sing accelerometer

measurements, it should be possible to classify driving habits as safe or unsafe”).

Accordingly, a POSITA would have recognized that important information stored in the local memory of the devices of Forstall and Langle2009 may be inadvertently erased and overwritten with new data, and would have recognized in Katayama’s teachings a solution that could be applied in the context of the Forstall-Rabu-Langle2009-Warren device: bifurcation of the local memory into temporary and long term sections, with storage of information identified as important in the long term section. USAA-1003, ¶185; USAA-1024, [0001]-[0002], [0016], [0044]-[0051], [0057]. This would “enable[] effective use of the memory without erasing important situation data” and “eliminat[e] accumulation of useless data,” while at the same time furthering Langle2009’s goals of “aid[ing] in safe driving practices and detection of emergencies” and “classify[ing] safe versus unsafe driving” by enabling the Forstall-Rabu-Langle2009-Warren device to detect both accidents and “risk incidents.” USAA-1029, Abstract, 1; USAA-1024, [0016], [0053], [0044], [0046]; USAA-1003, ¶¶186-187.

A POSITA would have configured the Forstall-Rabu-Langle2009-Warren device to record situation data determined to be “important” with a metadata “identifier” marking it as such, and to transfer situation data with the identifier from the local memory’s temporary storage to its long term recording section.” USAA-1024, [0001]-[0002], [0011]-[0016], [0027], [0046]-[0050], [0054], [0083];

USAA-1003, ¶188. And, again consistent with Katayama’s teachings, the POSITA would have configured the Forstall-Rabu-Langle2009-Warren device to store situation data determined to be less than important with a metadata “identifier” marking it as such, until such time as the unimportant situation data is overwritten with new data. USAA-1024, [0011]-[0016], [0054]; USAA-1003, ¶188.

As noted above, a POSITA would have understood and found obvious that the Forstall-Rabu-Langle2009-Warren-Katayama device resulting from these collective enhancements would, in comparison with the Forstall-Rabu-Langle2009-Warren device, enjoy improved data management with reduced likelihood of erasure of important data. USAA-1003, ¶189; USAA-1028, [0055]-[0057]; USAA-1024, [0014]-[0016], [0045], [0053]. Further, the POSITA would have understood and found obvious that the above enhancements would improve Langle2009’s driving safety monitoring techniques, by enabling identification of accidents and “risk incidents”, with corresponding improvements to the sophistication of driving safety metrics.<sup>10</sup> USAA-1029, 1-3; USAA-1024, [0044]-

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<sup>10</sup> For example, a POSITA would have recognized that Katayama’s techniques for managing “situation data” would advantageously enable the Forstall-Rabu-Langle2009-Warren device to determine the “surrounding situation or the like of a

[0046]; USAA-1003, ¶189.

Several advantages would have motivated a POSITA to integrate Katayama into the Forstall-Rabu-Langle2009-Warren device. USAA-1003, ¶¶190-195; USAA-1028, [0055]-[0057]; USAA-1029, 1-3; USAA-1024, [0001]-[0002], [0011]-[0016], [0027], [0044]-[0050], [0054], [0083]. Claims 9, 10, 17, 18, 35-38 *[9.1]/[35.1]*

As discussed above (§III.D.1(b)), a POSITA would have configured the Forstall-Rabu-Langle2009-Warren-Katayama device's memory ("**memory**") to feature several sections according to, and facilitating use of Katayama's teachings on data management, including a temporary section ("**short term memory**") and a storage section ("**long term memory**"). USAA-1024, [0044]; USAA-1028, [0055]-[0057]. Implementation of Katayama's teachings on memory architecture and data management enable the Forstall-Rabu-Langle2009-Warren device to, among other things, achieve several benefits, including the ability to retain (i.e., store over long time periods) data indicating unsafe driving behaviors in the storage section while

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motor vehicle during a certain period before and after a time of an accident or...risk incident," and to "very easily and accurately[,] enable "after-the-fact analysis" of accidents and risk incidents by third parties. USAA-1024, [0001], [0027].

also ensuring sufficient capacity to store data in the temporary section. USAA-1024, [0045]; USAA-1028, [0055]-[0057], Fig. 3; USAA-1003, ¶196.

As explained in [1.7], the Forstall-Rabu-Langle2009-Warren-Katayama device processes sensor data to derive “driver safety” information. USAA-1029, 1-3. Further, the Forstall-Rabu-Langle2009-Warren-Katayama device would receive “situation data” including sensor data “at a constant sampling time one after another in a chronological order,” and write “the received situation data” in a temporary section within the Forstall-Rabu-Langle2009-Warren-Katayama device’s memory. USAA-1024, [0016], [0044]-[0049]; USAA-1003, ¶197.

To avoid erasure of situation data, the POSITA would have further configured the Forstall-Rabu-Langle2009-Warren device to “digitalize” temporarily stored situation data for purposes of determining, at the “time of recording,” whether that digitalized situation data meets one or more predetermined criteria for long term storage. USAA-1024, [0001]-[0002], [0011]-[0016], [0027], [0046]-[0050], [0054], [0083]; USAA-1003, ¶198.

A POSITA would have configured the Forstall-Rabu-Langle2009-Warren-Katayama device to record situation data determined to be “important” with a metadata “identifier” marking it as such, and to transfer situation data with that identifier from the local memory’s temporary storage to its long term recording section.” USAA-1024, [0001]-[0002], [0011]-[0016], [0027], [0046]-[0050],

[0054], [0083]; USAA-1003, ¶199. More specifically, the important situation data would be retained to enable “after-the-fact analysis” of, for example, accidents and risk incidents, and would for at least that reason be understood as being “*persistently*” stored. USAA-1024, [0001], [0027], [0046]-[0052]. Katayama also render this limitation obvious through disclosures of various storage configurations. USAA-1003, ¶¶199-207.

**[9.2]/<sup>11</sup>[35.2]**

A POSITA would have understood and found obvious that the situation data sequentially written to the temporary section “one after another” includes both sensor data and information derived therefrom (digitalized data, metadata identifiers) given Katayama’s broader disclosure of the situation data being “automatically classified at a time of recording.” USAA-1003, ¶¶209-208; USAA-1024, [0016]. Katayama teaches “make[ing] after-the-fact analysis,” and a POSITA would have found it advantageous to implement these techniques such that these specific portions of situation data are similarly written one after another

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<sup>11</sup> The “update rate” recited in this limitation is distinct from a “sampling rate” recited in other dependent claims. This limitation is not limited to sampling, and broad enough to encompass other aspects of data storage, consistent with the ’369 patent specification. USAA-1001, 7:62-8:7.

in the temporary section. USAA-1003, ¶¶209-211; USAA-1024, [0016].

A POSITA would have found obvious that the temporary section receives situation data, including sensor data and derived information (digitalized data, metadata identifiers). USAA-1003, ¶212. Further, the temporary section obtains data more frequently (“*receives driving information at a higher update rate*”) than the long term storage section. USAA-1024, [0044]-[0046], Fig. 5; USAA-1003, ¶213.

### **[9.3]/[35.3]**

A POSITA would have understood and found obvious that derived information within the situation data, such as digitalized data and associated metadata identifiers reflecting importance classifications, are each written in the temporary section. USAA-1003, ¶¶214-217. Thus, a POSITA would have found it obvious the Forstall-Rabu-Langle2009-Warren-Katayama device writes derived information specified in situation data (digitalized values, metadata identifiers) in the temporary section (“*write driving information to the short term memory*”). For example, the Forstall-Rabu-Langle2009-Warren-Katayama device writes the derived information specified in the situation data (digitalized values, metadata identifiers) at a constant sampling rate (“*predetermined update rate*”) and while a vehicle is monitored according to a chronological order (“*predetermined sequence*”). USAA-1024, [0044]-[0046], Fig. 5; USAA-1003, ¶¶218-220. A

POSITA would have also understood that predetermined sampling of sensor data involves a predetermined update rate of writing associated data into storage since similar storage configurations were well-known by the Critical Date. USAA-1003, ¶220 (citing USAA-1027, 70-71).

**[9.4]/[35.4]**

As discussed in §III.A.1(e)(iii), the Forstall-Rabu-Langle2009-Warren-Katayama device would have leveraged Katayama to “eliminat[e] accumulation of useless data” and to make “effective use of the memory without erasing important situation data,” while at the same time furthering Langle2009’s goals of “classify[ing] safe and unsafe lane changes.” USAA-1029, Abstract; USAA-1024, [0016], [0026], [0053], [0044], [0046]; USAA-1003, ¶221. Further, “[i]f a capacity of the [short term memory section]...runs out, old data is sequentially erased and new situation data is written in” to the short term memory section. USAA-1024, [0045]. A POSITA would have understood that, being “*sequentially* erased,” old data is erased according to the chronological order in which it was written into the short term memory section, which is First in, First Out (“FIFO”), a typical replacement policy commonly used to overwrite old data in a memory when the memory is full. USAA-1003, ¶222; USAA-1027, 70-71; USAA-1039, [0003]-[0004].

**[10.1]/[36.1]**

As discussed for [2] (*see* §III.A.4), a POSITA would have configured the Forstall-Rabu-Langle2009-Warren-Katayama device to classify driving behaviors based on sensor data, and POSITA would have understood detection of a particular driving behavior to represent “*detect occurrence of a predetermined event.*”

USAA-1029, 502; USAA-1030, [0051]; USAA-1003, ¶223.

**[10.2]/[36.2]**

Katayama describes transferring situation data from section 802 to section 803 in response to satisfaction of predetermined conditions associated with accident detection. USAA-1024, [0046]. The conditions can relate to acceleration data, such as “whether or not the acceleration (deceleration) exceeds a predetermined judgement criterion,” or “whether or not the acceleration continues for more than or equal to a certain period...” *Id.*, [0048]. A POSITA would have therefore understood that in circumstances where an accident is detected based on acceleration data that also satisfies a predetermined condition, the situation data is transferred from temporary data storage section 802 to situation data recording section 803 “*in response to*” the accident being detected. USAA-1003, ¶224.

**[17]/[37]**

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

*condition of the vehicle*”). USAA-1024, [0034], [0064]. Examples of the vehicle sensors include “automobile speed meter 10 incorporated into the vehicle, the door 11, the emergency brake 12 and the ignition switch 13.” *Id.*, [0064]. In the combination (§III.D.1(b)), a POSITA would have configured the device to obtain data from vehicle sensors as this configuration would have improved the accuracy of monitoring for unsafe driving behaviors. USAA-1003, ¶225.

Further, data used for accident detection includes “position data indicating a position of the vehicle, speed data indicating a speed of the vehicle, brake data indicating whether or not a brake of the vehicle is activated, door open/close data indicating whether a door is open or closed” (“*at least a portion of the external driving information*”). Given that external vehicle sensor data is used to detect accidents, a POSITA would have found it obvious to configure the device to receive at least a portion of the data collected by external vehicle sensors (“*external device*”). USAA-1003, ¶226.

**[18]/[38]**

A POSITA would have configured the Forstall-Rabu-Langle2009-Warren-Katayama device to communicate wirelessly with external vehicle sensors (“*arranged to interface with the external device wirelessly*”). USAA-1003, ¶227. In Katayama, driving recorder 1 receives data collected by external vehicle sensors (e.g., vehicle speed data, door open/close data, brake data). USAA-1024, [0038].

A POSITA would have understood and/or found obvious to configure the device to implement a wireless connection with the external vehicle sensors since Katayama's recorder 1 and Forstall's device each include wireless modules configured to enable wireless communication with other devices. USAA-1028, [0038]; USAA-1024, [0074]; USAA-1003, ¶227 (citing USAA-1045, [00117], [00178], FIG. 41-43).

**E. [GROUND 1E] – Forstall-Rabu-Langle2009-Warren-Thompson2010 Renders Claims 14, 15, 32, and 33 Obvious**

**1. Forstall-Rabu-Langle2009-Warren-Thompson2010**

**(a) *Thompson2010***

Thompson2010 is focused on smartphone-based accident detection applications. It describes “how smartphones in a wireless mobile sensor network can capture the streams of data provided by their accelerometers, compasses, and GPS sensors to provide a portable ‘black box’ that detects traffic.” USAA-1008, 30; USAA-1003, ¶94. Figure 2 shows a smartphone-based accident detection system.

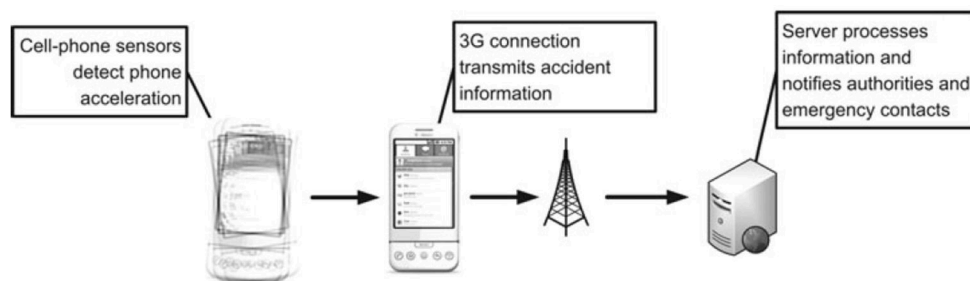


**Fig. 2.** Smartphone-Based Accident Detection System

USAA-1008, Fig. 2

Thompson2010's system employs a client-server architecture in which "sensors built into a smartphone detect a major acceleration event indicative of an accident and utilize the built-in 3G data connection to transmit that information to a central server." USAA-1008, 30. The server "then processes the information and notifies the authorities as well as any emergency contacts." *Id.* This client-server architecture is called "WreckWatch," which a "mobile client/server application [] developed to automatically detect car accidents." USAA-1008, 30. WreckWatch is "separated into two main components—the WreckWatch server and the WreckWatch client," as shown in Figure 3. USAA-1003, ¶95.

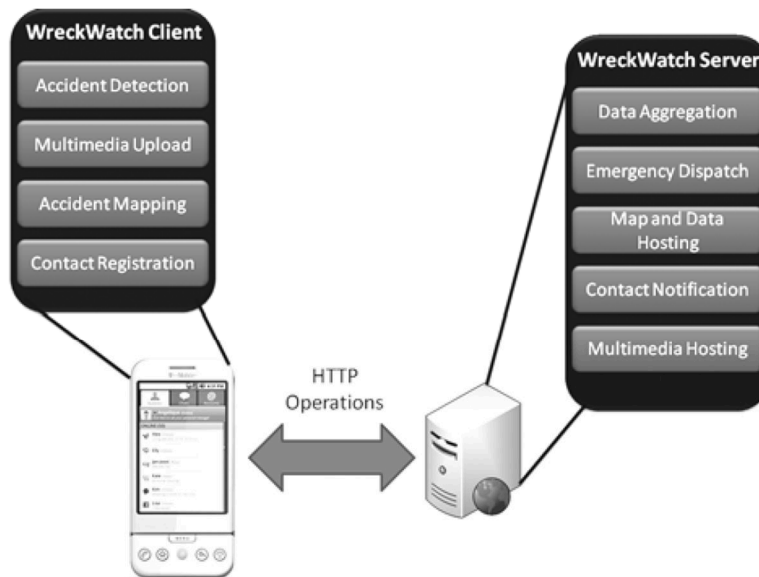


**Fig. 3.** WreckWatch Architecture Diagram

USAA-1008, Fig. 3

(b) *Proposed Combination*

As discussed in the previous section, Thompson2010 describes techniques for using smartphone system sensors, such as GPS sensors and accelerometers, to provide smartphone-based accident detection. USAA-1008, 30, Fig. 2. A POSITA would have been motivated to incorporate this feature into the Forstall-Rabu-Langle2009-Warren combination and thereby configure a device to prevent casualties that may result from a vehicle accident. USAA-1003, ¶228.

Thompson2010's accident detection technique would have advanced Langle2009's overall motivation to "enhance safety" using "embedded accelerometers" of mobile devices to provide "risk level detection while riding in a vehicle." USAA-1028, 502. This combination would have enabled motion recording technique to achieve advantages that Thompson2010 describes for smartphone-based accident detection, including "reduc[ing] overall traffic congestion and increas[ing] the preparedness of emergency responders." USAA-1008, Abstract. Further, because Forstall teaches that memory of a device stores "communication instructions" to permit communications with "one or more servers[,] a POSITA would have perceived incorporating Thompson2010's client-server architecture as an implementation detail. USAA-1028, [0056]; USAA-1008, 30, 33-34; USAA-1003, ¶229. A POSITA would have also had a reasonable success in implementing the combination without invention since accident

detection using smartphones was well-known by the Critical Date. USAA-1003, ¶229 (citing USAA-1007).

## 2. Claims 14, 15, 32, 33

### *[14.1]/[32.1]*

In Thompson2010, a smartphone detects traffic accidents. USAA-1008, 30. In the combination (*see* §III.E.1), a POSITA would have configured the device to perform Thompson2010's accident detection technique and thereby detect traffic accidents. Thompson2010 describes this is accomplished using "sensors built into a smartphone to detect a major acceleration event indicative of an accident and utilize the built-in 3G data connection to transmit that information to a central server." USAA-1008, 30; USAA-1003, ¶230; ; *see also* USAA-1024, [0039], [0075].

### *[14.2]/[32.2]*

As discussed for [1.8] (*see* §III.A.2), a POSITA would have configured memory (e.g., memory 350) to store driving safety. USAA-1028, [0056]. Further, in the combination with Thompson2010 (*see* §III.E.1(b)), a POSITA would have configured the memory to store sensor information indicating a traffic accident using Thompson2010's accident detection technique ("***store driving information associated with that event to the memory***"). *Id.*, [0006], [0055], [0056]; USAA-1003, ¶231. The memory stores various information, including a "device position" (USAA-1028, [0008]), "sensor data" and "map data" (*id.*, [0075]), and

“instructions for handling basic system services and performing hardware dependent tasks” (*id.*, [0055]). Thompson2010 describes that a smartphone executes a “WreckWatch Android client” that runs “[b]ackground services [that] detect accidents by polling smartphone system sensors, such as the GPS receiver and accelerometers[,]” where “[t]he polling rate is configurable at compile-time to meet user needs and to provide the appropriate consumption characteristics.”

USAA-1008, 33. Given these disclosures, a POSITA would have found it obvious to configure the memory to store raw sensor data used for accident detection (e.g., GPS data, accelerometer data) and data generated through the processing of raw sensor data by the device in detecting a traffic accident. USAA-1003, ¶231.

Further, “a POSITA would have recognized Thompson2010’s disclosure of accident image upload to a server suggests that the uploaded accident images (and associated accident information) are at least temporarily stored in memory prior to upload.” *Id.* (citing USAA-1008, 32, Fig. 4); *see also* USAA-1024, [0046], [0050], [0051].

***[15.1]/[33.1]***

*See* [14.1], *supra*. USAA-1003, ¶232.

***[15.2]/[33.2]***

Thompson2010 describes that a mobile client on a smartphone (WreckWatch client) uploads (“*transmit*”) data associated with a detected accident

(“*driving information associated with that event*”) to an associated server

(WreckWatch server) (“*a remote data-logging system*”). USAA-1008, 30. In the combination (*see* §III.E.1(b)), a POSITA would have configured Forstall’s system to incorporate a similar client-server architecture such that the navigation application of the device provides similar functionality as the WreckWatch client, and a server providing basic services to the navigation application provides similar functionality as the WreckWatch server. USAA-1029, [0040]-[0045]. Forstall contemplates such a configuration since device memory “store[s] communication instructions 354 to facilitate communicating with one or more additional devices,” such as “one or more servers.” *Id.*, [0056]. Thus, a POSITA would have found it obvious to configure the navigation application with functionality for uploading data associated with a detected accident to server 104 (as taught in Thompson). *Id.*; USAA-1008, 30, 32-35; USAA-1003, ¶233; *see also* USAA-1024, [0046], [0050], [0063].

**F. [GROUND 1F] – Forstall-Rabu-Langle2009-Warren-Willis  
Render Claims 45, 50, 53 Obvious**

**1. Forstall-Rabu-Langle2009-Warren-Willis**

(a) *Willis*

Willis is focused on techniques for “determining the proximity of radio frequency devices using the analysis of a series of receive signal strength indicator (RSSI) values.” USAA-1009, Abstract. Further, “RSSI values are used in a range

of situations” and “in various radio frequency technologies including General Packet Radio Service (GPRS), Global System for Mobile Communications (GSM), Code division multiple access (CDMA), Bluetooth™, ZigBee™, Wifi 802.11x, and other Radio Frequency Identification (RFID) methods.” *Id.*, 1:23-27. Wilson discloses an exemplary embodiment “applied to measurement of Bluetooth signal strength from a mobile phone inside a stationary vehicle.” *Id.*, 14:25-15:3. This “provide[s] a proximity detection of the phone coming within 2 meters of the vehicle in any manner from any direction.” *Id.*; USAA-1003, ¶96.

(b) *Proposed Combination*

The combined device includes “one or more wireless communication subsystems,” such as a “Bluetooth[] communication device 188.” USAA-1028, USAA-1003, ¶234. A POSITA would have understood that “Bluetooth” means “the industrial specification for wireless personal area networks that provides a mechanism for exchanging information between cell phones, pocket PCs, PDAs, and the like.” USAA-1009, 9:22-24.

A POSITA would have also understood that proximity detection based on Bluetooth signal strengths (in Willis) is an implementation detail and/or obvious design choice of many (if not all) Bluetooth sensors of mobile devices. USAA-1003, ¶235. Willis’ techniques involve “[t]he use of core Bluetooth™ functionality [that] enables the invention to be used with a broad range of

Bluetooth™ capable devices and avoids the incompatibility issues suffered by predecessor devices.” USAA-1009, 31:6-8; USAA-1003, ¶235. Thus, a POSITA would have found it obvious that Bluetooth communication device 188 detects a proximity of a car using “the signal strength of the Bluetooth receiver inside [the] car,” as described in Willis. USAA-1009, 19:10-14; USAA-1003, ¶235.

## **2. Claims 45, 50, 53**

### ***[45.1]/[50.1]/[53.1]***

In Willis, a Bluetooth sensor (“*proximity sensor*”) detects proximity of a nearby vehicle using Bluetooth signal strength. USAA-1009, 1:23-27, 14:25-15:3. The Forstall-Rabu-Langle2009-Warren-Willis device includes Bluetooth communication device 188, which a POSITA would have configured to detect proximity of a vehicle. *Id.*; USAA-1003, ¶236.

### ***[45.2]/[50.2]/[53.2]***

In the combination (§III.F.1(b)), a POSITA would have configured Bluetooth communication device 188 of the device to detect proximity of a vehicle (“*detect the proximity of the mobile telecommunications device to the vehicle*”) (as taught in Willis). USAA-1009, 1:23-27, 14:25-15:3; USAA-1003, ¶237.

## **G. [GROUND 1G] – Forstall-Rabu-Langle2009-Warren-Berkobin Renders Claims 55 Obvious**

### **1. Forstall-Rabu-Langle-Warren-Berkobin**

#### **(a) Berkobin**

Berkobin is focused on determining driver behavior based on vehicle operating parameters and adjusting insurance premiums based on the driver behavior. USAA-1010, Abstract. Berkobin also teaches embodiments in which its disclosed techniques “can employ Artificial Intelligence techniques such as machine learning and iterative learning[,]” such as “Bayesian networks, behavior based AI, neural networks, fuzzy systems, evolutionary computation...” *Id.*, [0031]; USAA-1003, ¶97.

(b) *Proposed Combination*

As discussed in §III.G.1(a), using artificial intelligence to evaluate driver information well-known by the Critical Date. USAA-1003, XX; USAA-1010, [0031]; USAA-1025, [0047]; USAA-1026, [0094]. A POSITA would have been motivated to employ artificial intelligence to identify unsafe driving behaviors from motion data recorded for a vehicle for the reasons discussed in § III.G.1(b) (incorporated herein by reference). USAA-1003, ¶238.

A POSITA would have perceived the benefit of increasing accuracy of identifying unsafe driving behaviors since Langle2009 expresses a desire to “enhance and strengthen [the world’s] emergency services[.]” through the use of mobile devices to “aid in safe driving practices and detection of emergencies.” USAA-1029, Abstract. A POSITA would have looked to techniques for improving accuracy in driver safety monitoring, and in doing so, identified artificial

intelligence as an available tool to process sensor data collected by the device in identifying unsafe driving behaviors. USAA-1003, ¶239. A POSITA would also have had a reasonable expectation of success in implementing the combination because similar configurations were well-known by the Critical Date. USAA-1003, ¶239.

## 2. Claim 55

The proposed combination (*see* §III.G.1(b)) renders obvious the following limitations of claim 55 in the same manner as explained above for the corresponding claim 54 limitations listed in the table below. USAA-1003, ¶240.

| Claim 54 Limitation | Corresponding Limitations |
|---------------------|---------------------------|
| [54.1]              | [55.1]                    |
| [54.2]              | [55.2]                    |
| [54.3]              | [55.3]                    |
| [54.4]              | [55.4]                    |
| [54.5]              | [55.5]                    |
| [54.6]              | [55.6]                    |
| [54.7]              | [55.7]                    |
| [54.8]              | [55.9]                    |
| [54.9]              | [55.10]                   |
| [54.10]             | [55.11]                   |

**[55.8]**

The term “neural network” appears once in the ’879 patent specification and relevant disclosure closely repeats the language recited by this claim limitation.

USAA-1001, 6:61-7:3 (“use of virtual neural networks can be used to determine whether the driving information represents acceptable or unacceptable driving patterns”). Beyond these general descriptions, ’879 patent specification lacks any discernible disclosure relating to which types of specific neural networks are used to evaluate sensor data to identify acceptable or unacceptable driving patterns.

USAA-1003, ¶241.

Berkobin describes using a neural network to process sensor data and evaluate driving information (“*processing involving the use of a neural network*”). USAA-1010, [0002], [0031]. In the combination with Berkobin (*see* §III.G.1(b)), a POSITA would have configured the device to use a neural network to evaluate driving safety data (e.g., acceleration, braking) determine whether it indicates a safe driving behavior (e.g., safe acceleration, safe braking) (“*an acceptable [driving pattern]*”) or an unsafe driving behavior (e.g., unsafe acceleration, unsafe braking) (“*unacceptable driving behavior*”). USAA-1029, 502-504; USAA-1003, ¶242.

#### **IV. PTAB DISCRETION SHOULD NOT PRECLUDE INSTITUTION**

Consistent with Congressional intent, the goals of *Fintiv*, and Director Vidal’s interim guidance issued June 21, 2022 (“*Director’s Guidance*”), USAA asks the Board to consider this Petition’s challenges. IPR2020-00019, Pap. 11, 6 (PTAB

Mar. 20, 2020) (precedential)(“*Fintiv*”). A holistic analysis of the *Fintiv* framework favors institution.<sup>12</sup>

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, Paper 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, Pap. 24, 7 (June 16, 2020)(“*Sand Revolution*”)(informative); IPR2020-01019 Pap. 12, 14 (PTAB Dec. 1, 2020)(“*Sotera*”)(precedential).

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

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<sup>12</sup> Apart from USAA’s showing that the *Fintiv* factors favor institution, the *Fintiv* framework should not be followed because it is legally invalid. The framework (1) exceeds the Director’s authority, (2) is arbitrary and capricious, and (3) was adopted without notice-and-comment rulemaking.

each filed well in advance of the statutory bar date. IPR2020-00156, Pap. 10, 9 & n.8 (June 15, 2020) (“*Seven*”); USAA-1004.

Although the District Court—one of the busiest patent courts—has set an estimated March 2024 trial date, “scheduled trial dates are unreliable and often change.” USAA-1065, 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 and a typical delay in issuance of notice of filing date accorded of less than one month, the Board will likely 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 ’879 patent’s claims 1, 2, 4-7, 15, 18-21, and 26. But its contentions are preliminary, and PO has not committed to limiting its assertion to only these claims.

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 '879 patent. USAA-1075, 6. 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 utilizing any of Forstall, Rabu, Warren, Langle2009, Tamir, Balachandran, Katayama, Thompson2010, Willis, or Berkobin. 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 Paper 10, 13-16 (Dec. 8 2021) (“*AliveCor*”); IPR2021-00033, Paper 13, 14 (April 30, 2021).

**Factor 5** (overlap in parties) is, at worst, be neutral. The Litigation involves the same parties. The *Fintiv* decision “says nothing about situations in which the petitioner is the same as, or is related to, the district court defendant.” IPR2020-00122, Pap. 15, 10 (Crumbly, 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.

## **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 ’879 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 two additional petitions challenging the ’879 patent (IPR2023-00857, IPR2023-00858). USAA is not aware of any other disclaimers, reexamination certificates, or IPR petitions addressing the ’879 Patent.

USAA has also previously filed five IPR petitions challenging patents related to the ’879 patent, including petitions challenging U.S. Pat. No. 9,633,487 (IPR2023-00518, IPR2023-00519) and U.S. Pat. No. 10,192,369 (IPR2023-00768, IPR2023-00769, IPR2023-00770).

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

USAA provides the following designation of counsel.

| Lead Counsel                                                                                                                                                                                                                                     | Backup 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 5/4/2023

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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 13,944 words, which is less than the 14,000 allowed under 37 CFR § 42.24.

Dated: 5/4/2023

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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 4, 2023, a complete and entire copy of this Petition for *Inter Partes* Review and all supporting exhibits were provided via Federal Express, to the Patent Owner, by serving the correspondence address of record as follows:

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