

Petition for *Inter Partes* Review of U.S. Patent No. 9,152,609

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ALLSTATE INSURANCE COMPANY,
Petitioner,

v.

ATOS, LLC
Patent Owner.

U.S. Patent No. 9,152,609
Issued: Oct. 06, 2015
Filed: July 12, 2013

Inventors: Roy Schwartz
Zarick Schwartz

Title: VEHICLE STATE DETECTION

Inter Partes Review No. IPR2021-01209

**PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO.
9,152,609 UNDER 35 U.S.C. §§ 311-319 AND
37 C.F.R. § 42.1-.80 & 42.100-.123**

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Exhibit #	Reference Name
1001	U.S. Patent No. 9,152,609 (the “609 Patent”)
1002	Original File History of 609 Patent
1003	Declaration of Dr. William Michalson
1004	Curriculum Vitae of Dr. William Michalson
1005	Korean Registered Patent Number 10-0775006 to Kim, S., et. al.
1006	U.S. Patent No 8,065,508 to Rubin, et al.
1007	U.S. Patent No. 7,505,784 to Barbera, et al.
1008	Mitrovic, et al., “Reliable Method for Driving Events Recognition,” IEEE Transactions on Intelligent Transportation Systems, Vol. 6, No. 2, (2005).
1009	U.S. Patent Publication No. 2009/002147 to Bloebaum, et. al.
1010	US 2007/0072616 A1 to Irani
1011	Declaration of Dr. Ingrid Hsieh-Yee
1012	Linda Hall Library copy of Mitrovic, et al., “Reliable Method for Driving Events Recognition,” IEEE Transactions on Intelligent Transportation Systems, Vol. 6, No. 2, (2005).
1013	U.S. Patent No. 6,236,937 to Sanjai Kohli
1014	Certification of Accuracy of Translation of Korean Registered Patent Number 10-0775006 to Kim, S., et. al.

I. INTRODUCTION

Petitioner respectfully requests that trial be instituted on Claims 1-25 of U.S. Patent No. 9,152,609 (“the ’609 Patent”), and that those claims be cancelled as unpatentable.

The ’609 Patent is directed to a “a method of performing one or more actions on a portable device” through detecting what state the vehicle is in, determining an action to take on the portable device depending on what state the vehicle is in (or depending on a change in the state of the vehicle), and finally performing that action. EX1001, 11:1-14:42. The purported novelty of the ’609 Patent is the use of a portable device’s accelerometer in detecting the motion of a vehicle. EX1001, 2:16-17. But these method steps and the uses of an accelerometer were well known long before the ’609 Patent. Indeed, those in the field had routinely utilized accelerometers in portable devices to measure and analyze the motion of a vehicle and subsequently perform actions on those portable devices. EX1003, ¶¶46-48.

One group in particular had published a patent application reflecting each of the steps in the claimed methods, before the ’609 Patent’s earliest possible priority date of February 10, 2009. *See* Korean Registered Patent No. 10-0775006 to Kim, S., et. al, Abstract, <41> (EX1005) (“Kim”). Kim discloses a mobile terminal device with “an acceleration sensor” that is used to determine the “user’s context

or behavior” and the state of a vehicle by, for example, “sens[ing] vibration inside the vehicle,” and a “service creation unit” that performs an action in response to the detected state by “select[ing] a service to be provided to the user based on the context information.” EX1005, Abstract, <19>. Kim, alone, or in combination with other art, anticipates or renders obvious claims 1-25 of the ’609 Patent. As explained herein, the Board should therefore institute *inter partes* review and cancel each of the challenged claims.

II. COMPLIANCE WITH REQUIREMENTS FOR *INTER PARTES* REVIEW

A. Petitioner’s Certification

Petitioner certifies that it is not barred or estopped from requesting *inter partes* review of Claims 1-25 of the ’609 Patent (EX1001). Neither Petitioner nor any party in privity with them have filed a civil action or a prior petition for *inter partes* review challenging the ’609 Patent. Petitioner also certifies that this petition is filed within one year of the date of service of a complaint alleging infringement.

B. Fee for *Inter Partes* Review (§ 42.15(a))

The Director is authorized to charge the fee specified by 37 C.F.R.

§ 42.15(a) to Deposit Account No. 50-1597.

C. Mandatory Notices (37 C.F.R. § 42.8(b))

The real parties-in-interest of this petition are Allstate Insurance Company, Esurance Insurance Services, Inc., and Arity, LLC. Lead counsel and backup lead counsel are as follows:

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Service on Petitioner may be made by email sborder@sidley.com, mail or hand delivery to: Sidley Austin LLP, One South Dearborn, Chicago, IL 60603.

The fax number for lead and backup counsel is (312) 853-7036.

The '609 Patent relates to the following proceedings:

- *ATOS, LLC v. Allstate Insurance Company, Esurance Insurance Services, Inc., and Arity, LLC*, No. 1:20-cv-06224 (N.D. Ill.).
- *Allstate Insurance Company v. ATOS, LLC*, Case No. 2021-01118.

D. Proof of Service (§§ 42.6(e) and 42.105(a))

Proof of service of this petition is provided in **Attachment A**.

III. IDENTIFICATION OF CHALLENGED CLAIMS

Claims 1-25 of the '609 Patent are unpatentable as follows:

Ground	Reference(s)	Basis	Claim(s) Challenged
1	<u>Kim</u>	§ 102	1-5, 9, 11, 13-14, 17-19, 21-25
2	<u>Kim</u> in View of <u>Rubin</u>	§ 103	6-8, and 15
3	<u>Kim</u> in View of <u>Mitrovic</u>	§ 103	10 and 12
4	<u>Kim</u> in View of <u>Barbera</u>	§ 103	16, 18, and 19
5	<u>Kim</u> in View of <u>Barbera</u> , in further view of <u>Kohli</u>	§ 103	20

IV. LEVEL OF ORDINARY SKILL

In the 2009 time frame, a person of ordinary skill in the art (a “Skilled Artisan”) in the field of the ’609 Patent (portable devices and acceleration measurements) would have been someone with a bachelor’s or master’s degree in the field of mechanical engineering, electrical engineering, or physics or with a bachelor’s or master’s degree in a related field and at least three years of experience in designing or developing portable device systems. A Skilled Artisan would have been aware of the types of portable devices discussed below, would have known how that the internal accelerometers detect motion, and would have known how to utilize the portable devices and their accelerometers to detect motion while inside a vehicle. EX1003, ¶53.

V. THE '609 PATENT

A. Priority Date

For purposes of this IPR, Petitioner applies (but does not concede) a February 10, 2009 priority date, the filing date of the '508 Provisional. EX1003, ¶52.

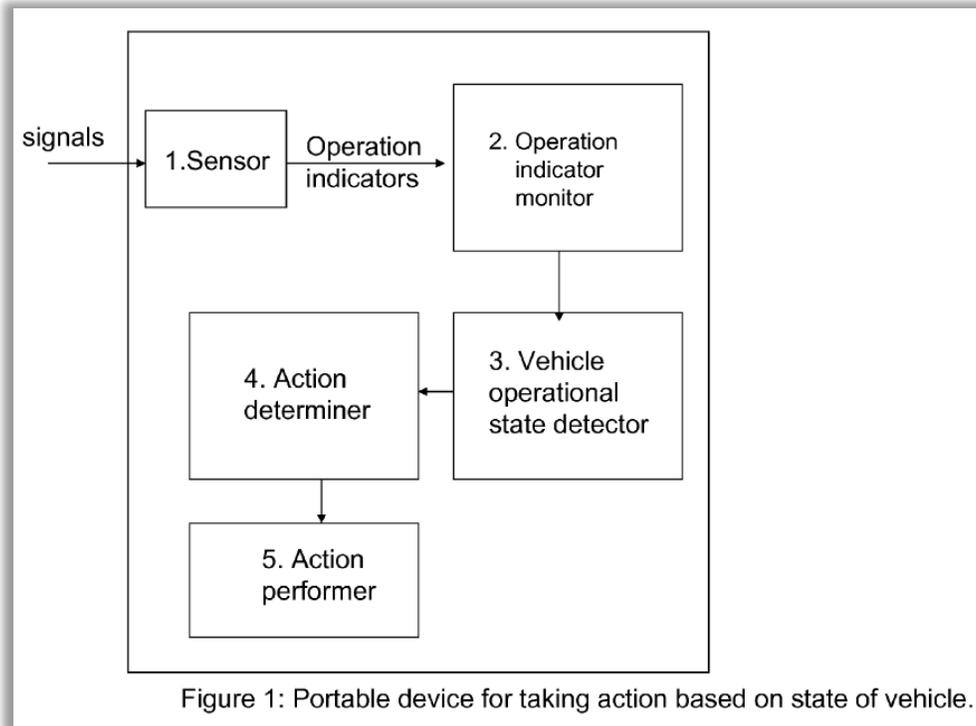
B. '609 Patent Overview

The '609 Patent explains that it is directed to “the detection of the state of a vehicle by a portable device carried by a user and the various actions taken upon the detection of the state.”¹ EX1001, 1:16-18. The “decision to perform an action [on the portable device] is based on determining the operational state of a vehicle,” where such determination is “based upon an onboard sensor on the device receiving signals from the environment and converting them to operation indicators.” EX1001, 3:52-57. The patent further describes using the detected “operational state” to take an action on the portable device, such as “blocking certain actions on the part of the user” if the vehicle is moving or moving above a specified speed threshold. EX1001, 2:47-48.

The “operational state[s]” of a vehicle include “engine is on,” “engine is off,” and “vehicle is stationary.” EX1001, 4:17-25. And actions taken “may have

¹ All emphasis is added unless otherwise noted.

been fixed or configured by the users or a third party.” EX1001, 4:39-40. Figure 1 illustrates a “portable device for taking action based on the state of the associated vehicle:” EX1001, 3:22-23.



EX1001, FIG. 1. Specifically, Figure 1 shows the different elements of the claimed invention: (1) a “sensor” that receives signals and produces “operation indicators”, (2) a component that monitors these “operation indicator[s],” (3) an “operational state detector,” (4) a component that determines an action, and (5) a component that performs an action on the portable device. EX1001, FIG. 1. For example, the device may record “vibrations measured with vehicle’s engine on and running,” EX1001, 5:32-33, and when the “vehicle is stationary,” and use these

measurements to determine the operational state of the vehicle (i.e. engine is on or engine is off). EX1001, 5:36-40.

C. Prosecution History

The '609 Patent issued from Application No. 13/987,218 (the '218 Application), which was filed on July 12, 2013. EX1001, Face; EX1003, ¶66. The '761 Application was a continuation of Application No. 12/703,761 filed on February 10, 2010, now issued U.S. Patent No. 8,527,140. EX1001, Face; EX1003, ¶66. Although the claims were rejected (and subsequently cancelled) several times, and a terminal disclaimer filed, none of that activity is relevant to the analysis below. *See generally* EX1002; EX1003, ¶¶67-69.

D. Claim Construction

The *Phillips* claim construction standard applies. *See* 37 C.F.R. § 42.100(b).

1. “operation indicator”

An “*operation indicator*” should be construed as “a sensor measurement determined from signals from the environment.” EX1003, ¶73.

The '609 Patent does not expressly define the term “operation indicator,” however it does provide definition through context. For example, the '609 Patent explains that “a vibration sensor may measure forces over time (i.e. the signals) and convert them into **number of vibrations measured per second (operation indicators).**” EX1001, 3:57-60. The '609 Patent also explains that “an onboard

sensor receives **signals from the environment and converts them into operation indicators**. Examples of **signals from the environment** include vibrations, acceleration, change in forces, noise, etc.” EX1001, 3:63-66.

2. “**on-board component**”

The term “*on-board component*” in the claims of the ’609 Patent should be construed to mean “a sensor that receives signals from the environment (for example, vibrations, acceleration, change in forces, noise, etc.), but does not receive data from a central place for example, weather information, traffic information, or location information (e.g., via GPS).” EX1003, ¶76.

The term “*on-board component*” does not appear in the specification of the ’609 Patent, but the specification uses the term “on-board sensor” in the same way as “*on-board component*” in the claims. For example, the specification explains that “[t]his determination of the operational state of the vehicle is based upon an **onboard sensor on the device receiving signals from the environment and converting them to operation indicators**.” EX1001, 3:54-58. And just as the claims recite the “*operation indicator is created by an on-board component of the portable device,*” EX1001, claim 1, the specification states that the “**on-board sensor receives signals from the environment and converts them into operation indicators**.” EX1001, 3:63-64; EX1003, ¶77.

The specification further states: “[i]n unit 1, an onboard sensor receives signals from the environment and converts them into operation indicators.”

EX1001, 3:63-64. The specification then explains: “[e]xamples of signals from the environment include vibrations, acceleration, change in forces, noise, etc. Note that **sensors do not receive** and are not responsible to receive **data from a central place, for example weather information, traffic information or location information (e.g. via GPS).**” EX1001, 3:66-4:2; EX1003, ¶77.

Moreover the patent repeatedly disclaims use of data from a central place, such as GPS: “**it is not possible to directly use GPS in the above application to detect whether a car is parked or moving.**” EX1001, 1:42-43. Similarly, the specification explains:

Using **GPS once again has the disadvantage that it cannot be used to detect when a user is walking or a vehicle is being driven slowly. . . .** And taking repeated GPS measurements is expensive in terms of battery consumption, and for this application, very frequently repeated measurements would have to be taken in order to timely block certain actions. **The battery drain would make GPS essentially useless for this application.**

EX1001, 1:51-59. The invention purportedly “does not have the above mentioned drawbacks in . . . a need for GPS to identify the operational state of the vehicle.”

EX1001, 2:34-37; EX1003, ¶78. These statements constitute a “clear and unmistakable disclaimer” of GPS technology for use in the “*on-board component*”

of a portable device that functions to receive signals from the environment. *See Thorner v. Sony Comput. Entm't Am., LLC*, 669 F.3d 1362, 1367 (Fed. Cir. 2012).

Accordingly, the term “*on-board component*” should be given the construction set forth above. EX1003, ¶79. As Dr. Michalson notes, the “*on-board component*” should be construed to exclude GPS because the specification makes clear that GPS is not used to “receive[] signals from the environment” and determine the state of the vehicle. EX1001, 3:63-64; EX1003, ¶79.

VI. THE PRINCIPAL PRIOR ART - KIM (EX1005)

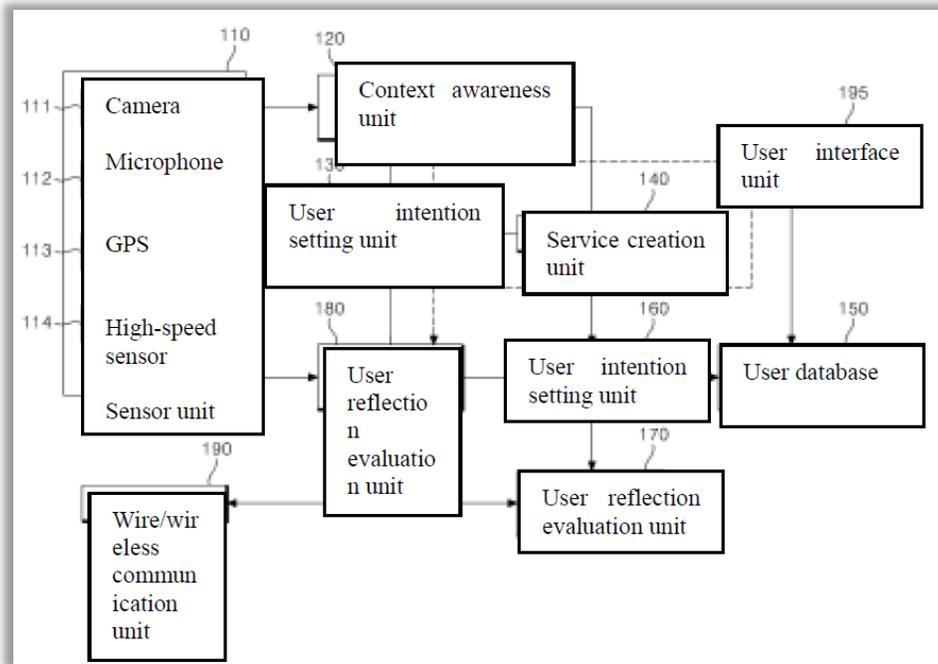
Kim was registered on November 2, 2007, and published November 8, 2007. EX1005, Face. Kim is therefore prior art to the '609 Patent under 35 U.S.C. §§ 102(a) and 102(b). The English translation of Kim attached to this petition reflects a true and accurate translation of the original document. EX1014.

Kim describes a “terminal” that is a “**device** for providing a context aware-based mobile service.” EX1005, Abstract. The “terminal” can “seamlessly provide a **mobile service** suitable for the user’s current location and context . . . [including] **inside of a vehicle, outdoors or indoors.**” EX1005, Abstract. The “terminal” refers to “mobile devices such as PDAs, **mobile phones**, and laptops” that are “equipped with sensors to recognize contexts including location recognition.” EX1005, <11>.

Kim discloses a device or embodiment that functions in a variety of contexts: “**a terminal and a method** for providing a context aware based mobile service **regardless of the physical characteristics of different places such as inside a car, outdoors, or indoors.**” EX1005, <15>. This embodiment—a terminal providing mobile services based on the changing context of the user—is discussed at length in Kim and is the embodiment discussed as prior art in this petition. *See* EX1005, <18>-<89>.

The “terminal” of Kim includes a series of units that function to determine the state or context of a user (and by extension, the state of a vehicle in which the user is traveling) and perform an action. In relevant part they are: (1) “a sensor unit,” (2) “a context recognition unit,” (3) “a user intention setting unit,” (4) “a service creation unit,” (5) “a service adaptation unit,” and (6) “a service execution unit.” EX1005, <19>.

Figure 1 of Kim shows “the provision of a continuous mobile service using a context awareness-based mobile service-providing terminal.” EX1005, <31>.



EX1005, FIG. 2. Figure 2 shows that the “sensor unit 110” monitors and **“detects an external context or action** using various sensors and outputs the corresponding sensor data.” EX1005, <39>. And the various sensors include **“an acceleration sensor 114 for instantaneous detection of the motion state of an object.”** EX1005, <40>. The “acceleration sensor” **“senses vibration inside the vehicle 200, such as, for example, vibration of the engine transmitted through the vehicle body.”** EX1005, <41>.

Kim explains that sensor data is used by the “context recognition unit 120” to detect and determine states, including vehicle operational states: it estimates “an external context or a user’s behavior by **comparing the sensor data** sensed through the sensor unit 110 **with a pattern of reference signals stored**” in the context recognition unit. EX1005, <42>. “[B]y comparing the sensor data sensed

through the sensor unit 110 with previously stored pattern data, the context awareness unit 120 is capable of estimating contexts or acts such as whether the user is in the driver's seat inside the car 200," and the unit "continuously detects a change in the user's context." EX1005, <42>, <43>. The "user intention setting unit 130" functions to estimate what the user intends to do and adjust the services provided, defining "the estimated user intention based on the context information recognized by the context recognition unit 120." EX1005, <44>.

The "service creation unit 140" determines an action to take; it "**selects an appropriate service based on the context information.**" EX1005, <45>. The "service adaptation unit 160 **adjusts the content of the service** selected by the service creation unit 140 **according to special conditions indicated in the context information.**" EX1005, <46>. Lastly, the "service execution unit 170" performs the action: it "**executes the service adapted to the user** by the service adaptation unit 160 and implements it." EX1005, <47>.

VII. PRECISE REASONS FOR REQUESTED RELIEF

A. Claims 1-5, 9, 11, 13, 14, 17, 18, 19, 21- 25 Are Anticipated by Kim (EX1005)

1. Claim 1

a. Preamble

Claim 1 recites "[a] method of performing one or more actions on a portable device carried by an individual, comprising:"

The '609 Patent describes a "*portable device*" as a "dedicated device" or an application that "may run as a software on a general purpose device, for example, the cell phone, pda, or smartphone." EX1001, 4:43-44. The specification gives examples of an "*action*" including "receiving traffic information, only when the vehicle is in a moving state or in the 'engine is on state,'" EX1001, 7:12-14, or "to block a requested application . . . [such as] texting while the car is moving." EX1001, 7:18-23. As Dr. Michalson describes, the '609 Patent's "*actions on a portable device*" involve effecting a change in the operation of a "*portable device*," "[f]or example, upon detection of the vehicle not moving, a portable device that also plays music can lower the volume." EX1001, 7:6-8; EX1003, ¶177.

Similarly, Kim's "terminal" may be "mobile devices such as PDAs, **mobile phones**," (i.e., "*portable device[s]*") that are "equipped with sensors to recognize contexts." EX1005, <11>; EX1003, ¶132. Kim also discloses "a context-aware **mobile service**" capable of recognizing a situation around a user by comparing detected "sensor data" with "previously stored pattern data" and "**adjusting the contents of the selected service . . . and providing it to the user.**" EX1005, <64>, claim 13; EX1003, ¶132.

Additionally, the "*portable device[s]*" in Kim can be used to take a variety of actions that change the operation of the mobile device, (i.e., "*performing one or*

more actions”), such as when it is detected “that the user is inside the car . . . automatically switch[ing] to a navigation mode.” EX1005, <75>; EX1003, ¶132.

b. Monitoring at Least One Operation Indicator

Claim 1 further recites “*monitoring at least one operation indicator transparently to the individual.*”

The phrase “*operation indicator*” should be construed to mean a sensor measurement determined from signals from the environment. See §V.D.1.

Kim discloses a “terminal” that includes a “sensor unit 110 [that] **detects an external context or action using various sensors and outputs the corresponding sensor data**”—(i.e., “*operation indicator*”)—for example by utilizing “**an acceleration sensor 114 for instantaneous detection of the motion state of an object by detecting dynamic forces such as acceleration, vibration, and impact.**” EX1005, <39>-<40>; EX1003, ¶136.

Kim discloses that the “the **context recognition unit 120 . . . acquires these physical signals through the sensor unit 110**, and estimates the context” or operational state of the vehicle. EX1005, <74>. The “context awareness unit 120” of the “terminal” in Kim “**continuously detects** a change in the user’s context,” and thus it functions to “*monitor[s] at least one operation indicator.*” EX1005, <43>. Further, the “terminal” in Kim monitors information in a way that is not

visible to the user, (i.e., “*transparently to the individual*”). EX1005, <43>; EX1003, ¶137.

(i) *Wherein Clause*

Claim 1 also requires “*wherein the at least one operation indicator is created by an on-board component of the portable device when the portable device is located inside a vehicle.*”

The term “*on-board component*” should be construed to mean “a sensor that receives signals from the environment (for example, vibrations, acceleration, change in forces, noise, etc.), but does not receive data from a central place (for example . . . GPS.)” *See* §V.D.2.

Kim discloses a “terminal providing a context awareness-based mobile service,” EX1005, <37>, that includes a “sensor unit 110 [that] **detects an external context or action using various sensors and outputs the corresponding sensor data**” (i.e., “*operation indicator*”). EX1005, FIG. 2, <39>. The sensor unit may include “**an acceleration sensor 114 for instantaneous detection of the motion state.**” EX1005, <40>. Then “**sensor data sensed and output by the sensor unit 110** are acquired by the context recognition unit 120,” (i.e., “*the at least one operation indicator is created by an on-board component*”). EX1005, <64>. The “terminal” containing the above components may be a

“mobile device[] such as PDAs, **mobile phones**, and laptops” EX1005, <11>, (i.e., “*the portable device*”). EX1003, ¶140.

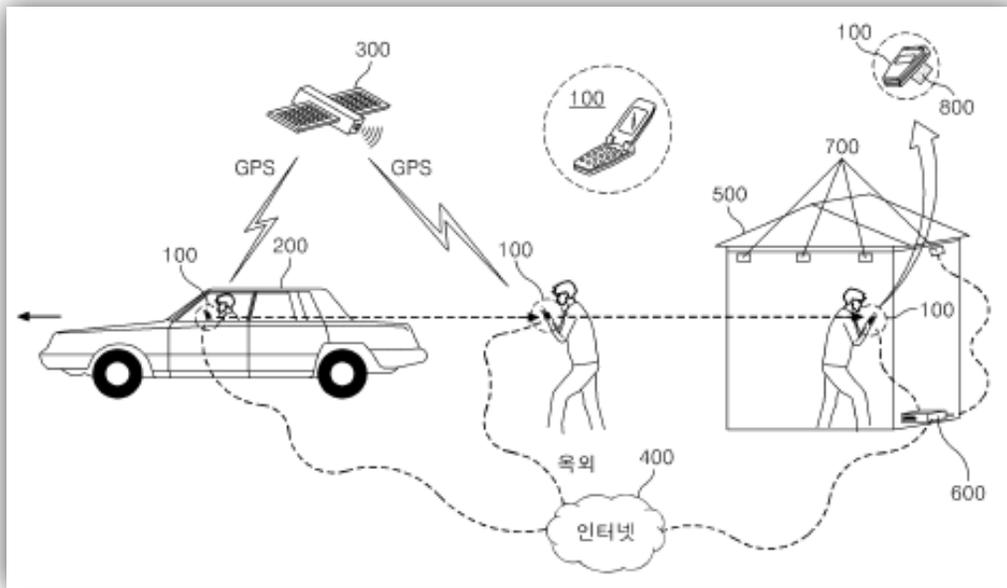
The “terminal” of Kim includes “an acceleration sensor 114 [that] is used to estimate the user’s context or behavior, in particular, it senses vibration **inside the vehicle**,” EX1005, <41>, (i.e., “*when the portable device is located inside a vehicle*”). EX1003, ¶141. Additionally, to the extent the Board were to construe “*on-board component*” to encompass the use of GPS (notwithstanding the disclaimer noted above), Kim also discloses “a GPS 113” as part of the sensor unit, which can provide “location information” when the vehicle is in motion. EX1005, <40>, <76>.

c. *Detecting the at least one operation indicator that meets one or more predetermined criteria*

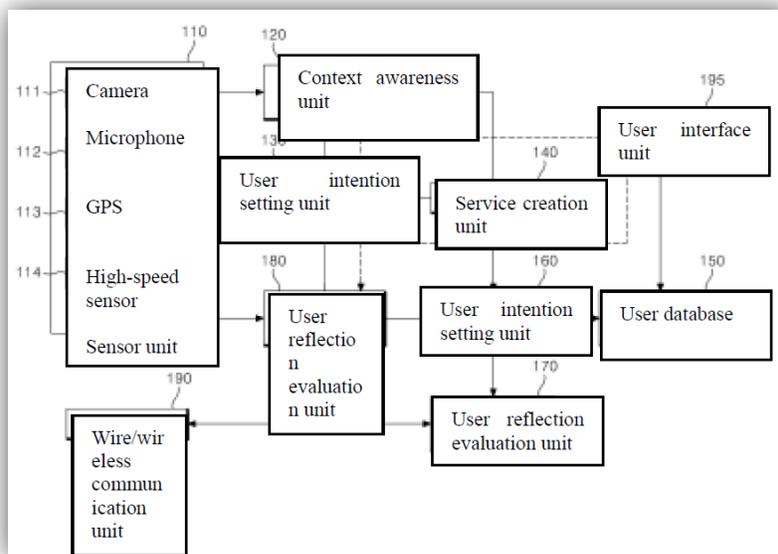
Claim 1 also recites “*detecting the at least one operation indicator that meets one or more predetermined criteria.*”

The phrase “*operation indicator*” should be construed to mean a sensor measurement determined from signals from the environment. See §V.D.1.

Figure 1 of Kim discloses continuously monitoring a user with a portable device, such as a cellphone 100:



EX1005, FIG. 1. Figure 2 of Kim depicts “a block diagram of a terminal providing a context awareness-based mobile service:” EX1005, <37>; EX1003, ¶144.



EX1005, FIG. 2. Kim’s “terminal” detects the state of a user (or vehicle) by comparing sensor data with predetermined patterns. The “context recognition unit

120 estimates an external context . . . by **comparing the sensor data** sensed through the sensor unit 110,” (i.e., “*detecting [when] the at least one operation indicator*”), “**with a pattern of reference signals stored therein**,” (i.e., “*meets one or more predetermined criteria*”). EX1005, <42>; *see also* EX1005, claim 9 (“the acceleration sensor detects the vibration of the engine transmitted through the vehicle body . . . the context-aware unit acquires physical signals of the vibration detected by the acceleration sensor and the noise detected by the microphone to determine a context.”); EX1003, ¶146.

d. *Determining Operational States of the Vehicle*

Claim 1 also recites “*determining one or more operational states of the vehicle based on the one or more predetermined criteria.*”

The ’609 Patent includes examples of an “*operational state[]*,” including “‘engine is on’ state, ‘engine is off’ state, the vehicle is moving state, and vehicle is stationary state.” EX1001, 4:22-25.

The “terminal” of Kim can determine “a context **inside the vehicle** 200 in which the user . . . is travelling,” and thus recognizes when the user is in a “*vehicle.*” EX1005 <33>; EX1003, ¶149 The “terminal” determines the state of the vehicle, as it “detect[s] a unique pattern of vibration and noise generated in the vehicle . . . and **infer[s] that the user is inside the vehicle**,” and further the “terminal” can determine the operational state of “**the engine is turned off**,” (i.e.,

“*determining one or more operational states of the vehicle*”). EX1005, <73>, <78>; EX1003, ¶153.

In addition, the “terminal” uses predetermined patterns to determine the operational state, specifically “it estimates the context by **comparing [physical signals] with the pattern of the self-stored reference signals,**” (*i.e.*, “*based on the one or more predetermined criteria.*”) EX1005, <74>; EX1003, ¶155.

e. *Determining at Least One Action*

Claim 1 also recites “*determining at least one action to be performed on the portable device carried by the individual, based at least in part on: ... the one or more operational states of the vehicle.*”

The terminal of Kim detects “**vibration and noise** generated in the vehicle,” EX1005, <73>, for example the “terminal” detects when a vehicle has stopped moving and determines “**that the engine is turned off,**” (*i.e.*, “*determining one or more operational states of the vehicle*”). EX1005, <78>; EX1003, ¶158.

The “terminal” of Kim also determines what action to take based on the observed operational state, specifically the “service creation unit 140 **selects an appropriate service**” (*i.e.*, “*determining at least one action to be performed*”) and that service is selected “**based on the context information** recognized by the context awareness unit,” (*i.e.*, “*based at least in part on . . . on the one or more operational states of the vehicle*”). EX1005, <45>. For example, Kim describes

how once the terminal detects vibrations from a vehicle's engine and determines that the user is sitting in the driver's seat, the "the service creation unit 140 selects a navigation service." EX1005, <74>-<75>; EX1003, ¶160. The "terminal" or portable device further performs the action, for example the terminal **"automatically switches to a navigation mode . . .** the service execution unit 170 executes the actual navigation service through the GPS 113 and provides it to the user," (*"on the portable device"*). EX1005, <75>; EX1003, ¶161.

f. *At Least One Previous Change*

Claim 1 also requires "*at least one previous change in the operational state of the vehicle.*"

Kim discloses that the service or action provided changes when the context or operational state changes, in one embodiment "the user intention setting unit [] defines the user's intention based on the context information recognized by the context recognition unit," or in other words "**the type of service to be provided to the user is defined,**" (i.e. "*determining the one or more actions.*") EX1005, <65>, and further discloses that "**it is possible to automatically provide a corresponding service according to changes in the service environment,**" EX1005, <26>, (i.e. based on "*at least one previous change in the operational state of the vehicle.*") EX1003, ¶¶164-165.

(i) Change in Operational State

Claim 1 also requires “*wherein the at least one previous change in the operational state comprises at least one of the following: a change from the vehicle being in a moving state to being a lingering state; a change from the vehicle engine being in an on-state to being in an off-state; a change from the vehicle being in the moving state to being in a stationary state; a change from the vehicle's speed being in a below predetermined speed limit state to being in an above the predetermined speed limit state; a change from the vehicle being in the stationary state to being in the moving state; a change from an engine being in an is off-state to being in an on-state; and a change from the engine being in the is off-state to the vehicle being in the moving state.*”

Because the limitation requires only “*at least one of the following*” it is sufficient for Kim to only disclose “*one of the following*” to anticipate this limitation. *See Brown v. 3M*, 265 F.3d 1349, 1351 (Fed. Cir. 2001). Kim discloses at least the following changes in operational state.

(ii) Vehicle Engine On to Off State

Claim 1 requires “*a change from the vehicle engine being in an on-state to being in an off-state.*”

Kim explains that the “terminal” detects when an engine is on: it “**senses vibration inside the vehicle 200, such as, for example, vibration of the engine transmitted through the vehicle body.**” EX1005, <41>. Kim further discloses

detecting when the engine is turned off, “when the vehicle 200 reaches the destination and **it is detected that the engine is turned off.**” EX1005, <78>; EX1003, ¶170.

(iii) Vehicle From Moving to Stationary State

Claim 1 also requires “*a change from the vehicle being in the moving state to being in a stationary state.*”

Kim explains that “**when the vehicle 200 stops**, the user carries the terminal 100 and comes out of the vehicle 200 and is located outdoors, this **context is recognized by the terminal 100.**” EX1005, <34>; EX1003, ¶171. The “terminal” thus detects when the vehicle was moving and has stopped or become stationary.

(iv) Vehicle From Stationary to Moving State

Claim 1 also requires “*a change from the vehicle being in the stationary state to being in the moving state.*”

Kim discloses detecting that a user has changed states to where the user is in a vehicle that is traveling, for example “**a context inside the vehicle 200 in which the user who has terminal 100 is travelling is recognized** through the terminal 100 and **switches to a vehicle service mode.**” EX1005, <33>. Dr. Michalson explains that in order to “switch[.]” modes, the system disclosed in Kim would be required to previously determine that the vehicle was not moving. EX1003, ¶172.

(v) Vehicle Engine Off to On State

Claim 1 also requires “*a change from an engine being in an is off-state to being in an on-state.*”

Kim first discloses that “it is detected that the engine is turned off.” EX1005, <78>. Kim further discloses detecting the “**vibration of the engine** transmitted through the vehicle body” to determine a vehicle’s state. EX1005, <41>. The terminal recognizes a context inside a vehicle “in which the user who has terminal 100 **is travelling**” and thus the engine must be on. EX1005, <33>. Kim therefore discloses detecting the difference between an engine is off state (no vibration) and an engine is on state (vibration detected). EX1003, ¶173.

g. *Performing the at Least One Action on the Portable Device.*

Claim 1 requires “*performing the at least one action on the portable device.*” As discussed above regarding the *preamble* of claim 1, Kim discloses “*performing the at least one action on the portable device.*” See §VII.A.1.a; EX1003, ¶¶176-180.

2. Claim 2

Claim 2 depends from claim 1 and recites the additional clause of “*wherein the portable device is a key fob or cell phone.*”

Kim discloses the use of “mobile devices such as . . . **mobile phones,**” an express disclosure that its “terminal” can be a “*cell phone.*” EX1005, <9>, <11>; EX1003, ¶¶182-183.

3. Claim 3

Claim 3 depends from claim 1 and recites the additional clause of “[t]he method of claim 1 wherein the one or more predetermined criteria include at least one of the following: a) pattern recognition models of the at least one operational indicator wherein the at least one operational indicator is generated at least due to one or more of the following: operation of the vehicle and movement of the portable device caused by the individual; b) one or more thresholds of the at least one operational indicator wherein the at least one operational indicator is generated at least due to one or more of the following: the operation of the vehicle and the movement of the portable device caused by the individual.”

Because the limitation refers to “at least one of the following” it is sufficient to show either part a) or part b) of this limitation to anticipate it. *See Brown*, 265 F.3d at 1351.

Kim discloses comparing sensor data “with a **pattern of reference signals** stored therein,” such as by “comparing sensor data output from the sensor unit with **pattern data previously input and stored**,” (i.e. “*pattern recognition models*.”) EX1005, <19>; EX1003, ¶188. Further, the “terminal” of Kim generates its sensor data from “a unique pattern of vibration and noise generated in the vehicle,” i.e. “*generated at least due to . . . operation of the vehicle*” EX1005, <73>; EX1003, ¶189. Kim thus discloses “a) *pattern recognition models of the at least*

one operational indicator wherein the at least one operational indicator is generated at least due to one or more of the following: operation of the vehicle and movement of the portable device caused by the individual.”

The “terminal” of Kim determines when an operation indicator of noise has fallen below a threshold or disappeared: “it is detected that the **engine is turned off and the noise has disappeared through the sensor unit.**” Kim thus discloses “*b) one or more thresholds of the at least one operational indicator wherein the at least one operational indicator is generated at least due to one or more of the following: the operation of the vehicle and the movement of the portable device caused by the individual.*” EX1005, <78>; EX1003, ¶191.

4. Claim 4

Claim 4 depends from claim 3 and recites “*wherein the at least one action is detecting at least one of the following type indicators: at least one location point of the portable device over time and an altitude of the portable device.*” As discussed above, Kim anticipates claim 3. See § VII.A.3.

Because the limitation recites “*at least one of the following*” it is sufficient to show only one of the listed factors to anticipate. See *Brown*, 265 F.3d at 1351.

The “terminal” of Kim is capable of entering an “outdoor service mode” by detecting the location of the user after the user has left the car. “When the user has the terminal 100 and is **walking outdoors** and moving (see Fig. 7(a)), **appropriate**

context-aware services are provided to the user,” (i.e., “*at least one action*”) and are “based on **the user’s location information** received through the GPS 113 of the sensor unit 110 attached to the terminal 100 and the **walking motion information input from the acceleration sensor 114.**” EX1005, <84>.

Therefore, Kim discloses the action of detecting “*at least one location point of the portable device over time.*” EX1003, ¶194.

5. Claim 5

Claim 5 depends from claim 4, and recites the additional clause of “*determining that the individual is a driver of the vehicle based at least in part on acceleration, forces, velocity, the at least one location point, and time.*” As discussed above, Kim anticipates claim 4. See § VII.A.4.

The “terminal” of Kim detects when the user is in the driver’s seat of the vehicle when the terminal “is generally **fixed to a cradle or mounted on a dashboard**” and then “detect[s] a **unique pattern of vibration** and noise generated in the vehicle” and subsequently “**infer that the user is inside the vehicle 200 and is sitting in the driver’s seat.**” EX1005, <73>; EX1003, ¶200.

Kim accordingly discloses this limitation. EX1003, ¶¶199-200.

6. Claim 9

Claim 9 depends from claim 3 and recites “*wherein the determining the one or more operational states of the vehicle further comprises identifying that the*

individual is a driver of the vehicle.” As discussed above, Kim anticipates claim 3. See § VII.A.3.

The terminal of Kim determines when the user is a driver of the vehicle. See VII.A.5. Specifically, Kim discloses detecting a “unique pattern of vibration and noise generated in the vehicle” to “infer that the user . . . **is sitting in the driver’s seat.**” EX1005, <73>; EX1003, ¶221.

7. Claim 11

Claim 11 depends from claim 9, and recites “*wherein the at least one operation indicator sequence comprises at least one of: acceleration, forces, velocity, location, and time.*” As discussed above, Kim anticipates claim 9. See § VII.A.6.

The limitation “*operation indicator sequence*” lacks proper antecedent basis, but petitioner maintains that Kim anticipates claim 11. Specifically, Kim discloses “**unique pattern of vibration** and noise generated in the vehicle” to “infer that the user . . . is sitting in the driver’s seat.” EX1005, <73>. As explained above, Kim discloses the limitations of claim 3, the additional limitation of claim 9. See § VII.A.6. Kim also discloses the limitation of claim 5 (“*determining that the individual is a driver of the vehicle based at least in part on acceleration, forces, velocity, the at least one location point, and time*”). See § VII.A.5; see also XV.C; EX1003, ¶234.

Kim accordingly discloses the additional elements of claim 11.

8. Claim 13

Claim 13 depends from claim 1, and recites “*wherein the one or more predetermined criteria are based at least on one or more previously determined operational states.*” As discussed above, Kim discloses claim 1. See § VII.A.1.

The terminal of Kim detects “when **the driving is stopped** and the user comes out of the vehicle 200,” and therefore recognizes the previous operational state of driving before the vehicle stopped (i.e., “*one or more previously determined operational states*”). The terminal “**detects this based on signals from**” sensors including “the microphone 112” and “the acceleration sensor 114” (i.e., “*one or more predetermined criteria*”), and in response to this change it “**enters the outdoor service mode.**” EX1005, <82>. The “terminal” then uses “the walking **motion information input from the acceleration sensor**” to determine the user’s context. EX1005, <84>. Specifically, Kim discloses detection of signals from its microphone and acceleration sensor that indicate a stopped vehicle (i.e., “*predetermined criteria*”) based on a change from a vehicle’s prior state of driving (i.e., “*based at least on one or more previously determined operational states*”). For example, Kim discloses using previously entered data to determine a current state, and that “the **pattern data previously entered** by the

user may comprise pattern data **corresponding to the context in which the user is driving.**” EX1005, <42>; EX1003, ¶¶240-244.

9. Claim 14

Claim 14 depends from claim 1, and recites the additional clause of “*wherein the determining the one or more actions based on the one or more operational states of the vehicle comprises: changing a previously determined operational state based on the one or more predetermined criteria.*” As discussed above, Kim discloses claim 1. See § VII.A.1.

The terminal of Kim detects when the user is “**sitting in the driver's seat,**” (i.e. “*a previously determined operational state*”). EX1005, <75>; EX1003, ¶246. Then, “when the driving is stopped and **the user comes out of the vehicle 200,** [the terminal] detects this **based on signals from . . . the sensor unit 110,**” (i.e., “*one or more predetermined criteria*”). EX1005, <82>; EX1003, ¶247. Then, while the user is outside of the vehicle and “walking outdoors and moving . . . **appropriate context-aware services are provided to the user based on the user's location information.**” EX1005, <84>; EX1003, ¶247. Thus, Kim discloses this limitation.

10. Claim 17

Claim 17 depends from claim 1, and recites the additional clause of “*wherein the determining the one or more operational states of the vehicle further*

comprises: determining a position of the portable device; and determining the one or more operational states of the vehicle based on the one or more predetermined criteria and the position of the portable device.” As discussed above, Kim discloses claim 1, which includes a disclosure of “*one or more predetermined criteria.*” See § VII.A.1.

Kim discloses detecting when the terminal “is generally **fixed to a cradle or mounted on a dashboard**” and detects “**a unique pattern of vibration and noise** generated in the vehicle” in order to “**infer that the user is inside the vehicle 200 and is sitting in the driver's seat.**” EX1005, <73>; EX1003, ¶273. Kim therefore discloses this limitation.

11. Claim 18

Claim 18 depends from claim 17 and recites the additional clause of “*wherein the determining of the position of the portable device comprises: determining the position of the portable device in relation to a driver’s seat of the vehicle.*” As discussed above, Kim discloses claim 17. See § VII.A.10.

Kim notes that “[w]hen the user is sitting in the driver’s seat, the terminal 100 is generally fixed to a cradle or mounted on a dashboard. In this case, the acceleration sensor 114 and the microphone 112 of the sensor unit 110 attached to the terminal 100 detect a unique pattern of vibration and noise generated in the vehicle 200 (vibration pattern 1, refer to Fig. 6(a)), and **infer that the user is**

inside the vehicle 200 and is sitting in the driver's seat,” (i.e. “*determining the position of the portable device in relation to a driver's seat of the vehicle*”).

EX1005, <73>; EX1003, ¶278. Kim therefore discloses this limitation.

12. Claim 19

Claim 19 depends from claim 18, and recites “*wherein the determining the position of the portable device in relation to a driver's seat of the vehicle comprises: determining that the vehicle is in a moving state and the individual is a driver of the vehicle.*” As discussed above, Kim discloses claim 18. See § VII.A.11.

As explained above, Kim discloses the limitations of claim 18, including disclosing that “[w]hen the user is sitting in the driver's seat, the terminal 100 is generally fixed to a cradle or mounted on a dashboard. In this case, the acceleration sensor 114 and the microphone 112 of the sensor unit 110 attached to the terminal 100 detect a unique pattern of vibration and noise generated in the vehicle” (i.e., “*the vehicle is in a moving state*”) the terminal then “infer[s] that the user is inside the vehicle 200 and is sitting in the driver's seat” (“*the individual is a driver of the vehicle*”). EX1005, <73>; EX1003, ¶284.

13. Claim 21

Claim 21 depends from claim 1 and recites “*wherein at least one operation state of the one or more operational states of the vehicle matches at least in part*

characteristics associated with at least one of the following conditions: the vehicle is moving; the vehicle's movement is lingering; the vehicle's speed is below the predetermined speed limit; the vehicle's speed is above the predetermined speed limit; the vehicle's acceleration direction and level; the vehicle turns a corner; the vehicle is not moving; the vehicle is stationary; the individual is inside the vehicle; the individual is outside the vehicle; the vehicle's engine is off; and the vehicle's engine is on." As discussed above, Kim discloses claim 1. See § VII.A.1.

Because the claim requires "*at least one of the following*" it is sufficient to show only one of the elements for anticipation. See *Brown*, 265 F.3d at 1351.

As explained above, the "terminal" of Kim "**detect[s] a unique pattern of vibration and noise generated in the vehicle 200**" (i.e., "*the vehicle is moving . . . the vehicle's engine is on*") and then "**infer[s] that the user is inside the vehicle 200 and is sitting in the driver's seat**" ("*the individual is inside the vehicle*"). EX1005, <73>; EX1003, ¶¶300, 302.

Additionally, the terminal detects "**when the driving is stopped and the user comes out of the vehicle**" (i.e., "*the vehicle is not moving; the vehicle is stationary; . . . the vehicle's engine is off*") and "*the individual is outside the vehicle*"). EX1005, <82>; EX1003, ¶301.

14. Claim 22

Claim 22 depends from claim 1 and recites the additional clause of “*wherein the at least one operation indicator comprises at least one of: i) a measurement of at least one force acting on the vehicle measured at predetermined sampling periods, ii) a measurement of vibration of the vehicle; iii) a measurement of at least one kinematic quantity of rotation measured at predetermined sampling periods, iv) a measurement of at least one acceleration of the portable device measured at predetermined sampling periods in one or more directions, v) a representation of at least one noise indicator generated by the moving vehicle at predetermined sampling periods, and vi) a representation of at least one wireless signal associated with the vehicle.*”

Because this limitation recites “*at least one of*” it is sufficient to show only one of the listed items for anticipation. *See Brown*, 265 F.3d at 1351. The “terminal” of Kim “detect[s] a unique **pattern of vibration** and noise **generated in the vehicle**” and thus discloses a “*ii) measurement of vibration of the vehicle.*” EX1005, <70>, <73>; EX1003, ¶¶304-305.

15. Claim 23

Claim 23 depends from claim 1 and recites the additional clause of “*wherein the at least one operation indicator is created by an accelerometer located on the portable device.*”

The “terminal” of Kim includes a built-in “**acceleration sensor**” that functions to “**detect a unique pattern of vibration and noise** generated in the vehicle.” EX1005, <73>; EX1003, ¶309. Accordingly, Kim discloses this limitation. EX1003, ¶¶307-309.

16. Claim 24

Claim 24 depends from claim 1 and recites “*wherein the one or more predetermined criteria comprise at least one of: i) the at least one operation indicator matches at least one pattern recognition model, indicating that the vehicle is moving; ii) the at least one operation indicator matches at least one pattern recognition model, indicating that the vehicle movement is lingering; iii) the at least one operation indicator matches a vibration threshold, indicating the engine is off; iv) the at least one operation indicator matches a vibration threshold, indicating the engine is on; vi) the at least one operation indicator matches one or more thresholds, indicating the vehicle is moving; vii) the at least one operation indicator matches one or more thresholds, indicating the vehicle is stationary; viii) the at least one operation indicator matches at least one pattern recognition model that is associated with a driver of the vehicle; and ix) the at least one operation indicator matches at least one pattern recognition model that is associated with the individual that is walking.*”

Because this limitation recites “*at least one of*” it is sufficient to show only one of the list for anticipation. *See Brown*, 265 F.3d at 1351. As described above with respect to claim 3, Kim discloses “*at least one pattern recognition model.*” *See VII.A.3.* Specifically, Kim discloses that its terminal “estimates an external context,” such as that of a vehicle, “by comparing the sensor data sensed through the sensor unit 110 with **a pattern of reference signals stored therein.**” EX1005, <42>; EX1003, ¶311.

Kim further discloses that this pattern recognition can be applied to a variety of signals detected by the terminal, such as “**vibration of the engine** transmitted through the vehicle body, and solid transmission type **vibration caused by the resonance of the structure generated between the tire and the road** surface during driving.” EX1005 <73>-<74>; EX1003, ¶312. Kim therefore discloses pattern matching “*indicating the engine is on*” and “*indicating the vehicle is moving.*” EX1003, ¶313. Kim further discloses detecting “[w]hen the user has the terminal [] and **is walking outdoors and moving.**” EX1005, <84>; EX1003, ¶313. Kim therefore discloses the pattern recognition model “*associated with the individual that is walking.*”

17. Claim 25

Claim 25 recites “[a]n apparatus for monitoring a vehicle, the apparatus comprising: at least one sensor generating at least one operation indicator; at

least one operation indicator monitor configured to monitor one or more operation indicators; at least one vehicle operation state detector configured to: a) detect when the one or more operation indicators meet one or more predetermined criteria, wherein the one or more predetermined criteria correspond to characteristics identifying at least one operational state of the vehicle, b) select the one or more predetermined criteria that the one or more operation indicators meet, and c) assign the at least one operational state of the vehicle upon selection of the at least one predetermined criteria; at least one action determiner operable to select one or more actions based on the at least one operational state of the vehicle; and action performer operable to perform one or more actions based on the at least one operational state of the vehicle; whereby the one or more operating indicators are generated without any connection to other apparatuses in the vehicle and outside the vehicle.”

a. *Preamble*

The preamble of claim 25 recites “*an apparatus for monitoring a vehicle.*”

Kim discloses in Figure 2 (and its corresponding description) a “terminal providing a context awareness-based mobile service,” EX1005, <37>, that includes a “sensor unit 110 [that] detects an external context or action using various sensors and outputs the corresponding sensor data,” EX1005, FIG 2, <39>, for example by utilizing an “a microphone 112 that detects external voice and sound . . . and an

acceleration sensor 114 for **instantaneous detection of the motion state of an object**” and specifically discloses that the terminal “senses vibration **inside the vehicle**” (i.e., “*monitoring a vehicle*”) by detecting “dynamic forces such as acceleration, vibration, and impact.” EX1005, <40>-<41>. Kim also discloses that the “terminal” containing the above components may be a “**mobile terminal such as a PDA,**” EX1005, <12>, (i.e., “*an apparatus for monitoring a vehicle*”). EX1003, ¶316.

b. *at least one sensor generating at least one operation indicator*

The terminal of Kim includes sensors, “the **acceleration sensor . . . and the microphone**” that function to “detect a **unique pattern of vibration and noise** generated in the vehicle” (i.e., “*an operation indicator*”). EX1005, <73>; EX1003, ¶317. Kim therefore discloses this limitation.

c. *at least one operation indicator monitor configured to monitor one or more operation indicators*

Kim discloses that “[t]he **sensor unit 110 detects an external context or action using various sensors** and outputs the corresponding sensor data” (i.e., “*at least one operation indicator monitor*”). EX1005, <39>. Kim discloses further that “[t]his sensor unit 110 comprises **... a microphone 112 that detects external voice and sound ... and an acceleration sensor 114 for instantaneous detection of the motion state of an object** by detecting dynamic forces such as acceleration,

vibration, and impact” (i.e., “*configured to monitor one or more operation indicator*”). EX1005, <40>; EX1003, ¶319.

d. *at least one vehicle operation state detector configured to*

Kim discloses that “sensor data sensed and output by the sensor unit 110 are acquired by the **context recognition unit 120 (S1)**” (i.e., “*vehicle operation state detector*”) “and **then used for estimation of the user’s current context or behavior.**” EX1005, <64>; EX1003, ¶321. The “context recognition unit” of Kim is thus a “*vehicle operation state detector*” that is configured to perform a task, including detection of a vehicle’s state.

- e. [*vehicle operation state detector configured to*] a) *detect when the one or more operation indicators meet one or more predetermined criteria, wherein the one or more predetermined criteria correspond to characteristics identifying at least one operational state of the vehicle*
- b) *select the one or more predetermined criteria that the one or more operation indicators meet, and*
- c) *assign the at least one operational state of the vehicle upon selection of the at least one predetermined criteria;*

Kim discloses that its terminal has a “[t]he **context recognition unit 120** [that] estimates an external context or a user’s behavior by **comparing the sensor data sensed**” (i.e., “*one or more operation indicators*”) “**with a pattern of reference signals stored therein**” (i.e., “*one or more predetermined criteria*”). EX1005, <42>; EX1003, ¶323.

Kim further discloses that the “terminal” may store pattern data that corresponds to different operational states. EX1005, <42>. Specifically, Kim lists a series of predefined criteria and patterns: “**the pattern data previously entered by the user may comprise pattern data corresponding to the context in which the user is driving while sitting in the driver’s seat inside the car**” or the terminal can detect when a vehicle has stopped moving and determines “**that the engine is turned off**,” (i.e., “*wherein the one or more predetermined criteria correspond to characteristics identifying at least one operational state of the vehicle*”). EX1005, <42>, <78>; EX1003, ¶324.

Kim discloses that “by **comparing the sensor data** sensed through the sensor unit 110 **with previously stored pattern data**, the context awareness unit 120 is capable of estimating contexts or acts such as whether the user is in the driver's seat inside the car,” (i.e., “*the one or more predetermined criteria that the one or more operation indicators meet*”). EX1005 <42>; EX1003, ¶326.

Kim discloses that “the context awareness unit 120 continuously detects a change in the user’s context and **detects a change in a service environment, for example, an area such as inside, outdoors, or indoors of the vehicle 200.**” EX1005, <43>. Further, Kim explains that “the user intention setting unit 130 defines the user’s intention based **on the context information recognized by the**

context recognition unit 120 (S3)” (i.e., “*operational state of the vehicle*”).

EX1005, <65>; EX1003, ¶326.

- f. *at least one action determiner operable to select one or more actions based on the at least one operational state of the vehicle; and*

The “terminal” of Kim selects actions based on the determined operational state of the vehicle, specifically the “**user intention setting unit 130 defines the estimated user intention based on the context information recognized by the context recognition unit,**” and then the “user’s intention is set as a rule **indicating the type of service to be executed according to the perceived context**” EX1005, <44>, (i.e., “*at least one action determiner operable to select one or more actions based on the at least one operational state of the vehicle*”). Kim provides, as an example, that “when the user is sitting in the driver’s seat inside the car 200, a rule for a **navigation service** is set as the user’s intention.” EX1005, <44>; EX1003, ¶330.

- g. *action performer operable to perform one or more actions based on the at least one operational state of the vehicle;*

Kim discloses that the “service creation unit” (i.e., “*action performer*”) “selects an appropriate service **based on the context information recognized by the context awareness unit,**” (i.e. “*action performer operable to perform one or more actions based on the at least one operational state of the vehicle*”) and that

the “service creation unit [] may select a service suitable for the user’s intention by referring to the previously stored service list.” EX1005, <45>; EX1003,¶332.

- h.** *whereby the one or more operating indicators are generated without any connection to other apparatuses in the vehicle and outside the vehicle*

The “terminal” of Kim generates “operating indicators” through its sensor unit, which functions entirely with built in components: “**a camera [] that photographs and records an external image, a microphone [] that detects external voice and sound . . . and an acceleration sensor [] for instantaneous detection of the motion state of an object** by detecting dynamic forces such as acceleration, vibration, and impact.” EX1005, <40>; EX1003,¶334. The term “operating indicators” lacks antecedent basis, but for the purposes of this petition, it is assumed that “operating indicators” are “operation indicators.” Thus, as Dr. Michalson explains the “terminal” of Kim may generate operating indicators without connecting to other apparatuses. EX1003,¶334.

B. Claims 6, 7, 8, and 15 Are Obvious Over Kim in View of Rubin (EX1006);

1. Claim 6

Claim 6 depends from claim 4, and recites the additional clause of “*wherein the method further comprises: determining a type of the vehicle, wherein the type of the vehicle is one of the following: a taxi; a bus; a carpool; and a train.*” As discussed above, Kim discloses the elements of claim 4. See § VII.A.4.

It would have been obvious to include the functionality of “*determining a type of vehicle*” in the portable device of Kim in view of U.S. Patent No. 8,065,508 to Rubin, et al. (“Rubin”). Rubin is prior art under 35 U.S.C. § 102(e). EX1003, ¶98.

Rubin discloses using acceleration data pattern matching to detect when a user is riding in different vehicles. For example, Figure 1C discloses acceleration patterns for “a mobile device carried by a user **who is riding a train**,” (i.e., “*a train*”) and Figure 1D shows “a mobile device carried by a user **who is in a vehicle** in heavy traffic,” (i.e., which could include “*a carpool*”). EX1006, 5:17-19, 5:31-33; EX1003, ¶203.

Rubin’s mobile device “can receive and process real-time acceleration data, correlate the processed acceleration information with one or more acceleration profiles, and activate one or more applications based on the correlation.” EX1006, 17:5-8; EX1003, ¶204. Rubin therefore discloses “*a type of the vehicle, wherein the type of the vehicle is one of the following: a taxi; a bus; a carpool; and a train.*” The combination of Kim and Rubin therefore satisfies the additional elements of claim 6. EX1003, ¶¶205-206.

It would have been obvious to combine the capability of Rubin’s portable electronic device with the terminal device of Kim. EX1003, ¶207.

Kim and Rubin are analogous art to the '609 Patent because each expressly discloses portable electronic devices that may be cell phones, and specifically the application of using a portable electronic device to detect the motion of a vehicle. EX1005, <11> (“mobile devices such as PDAs, mobile phones. . .”); EX1006, 1:22-25, Fig. 6 (“e.g., Smartphones, personal digital assistants (PDAs), cellphones”). Moreover, all three references concern taking actions to change the services provided by the portable electronic device based on whether the device is determined to be in a moving vehicle. *Compare* EX1005, <75>, *with* EX1006, 17:5-8 (“receive and process real-time acceleration data, correlate the processed acceleration information with one or more acceleration profiles, and activate one or more applications based on the correlation.”) *with* EX1001 at 6:41-44 (“the request for an operation on the device by the user and the state of the vehicle is used to determine if an action should be performed by the device”). EX1003, ¶208.

Kim and Rubin are also both directed to the use of accelerometer data to detect the motion of a vehicle. EX1005, <75>; EX1006, 1:15-19. Accordingly, use of the additional method of Rubin in Kim to detect the type of vehicle would have been well within the level of ordinary skill in the art, would not have resulted in any unpredictable results and could have been readily accomplished without undue experimentation and with a reasonable expectation of success. EX1003, ¶209.

For similar reasons, a Skilled Artisan would have had reason to make the combination. Kim discloses the need for specific tailoring of services on a portable device based on whether the user is driving a vehicle, and detecting that state using an accelerometer on the portable device. EX1005, <75>. Rubin discloses the same setting of tailoring the services on a mobile device to a user's context: "automatically activating applications on a mobile device based on a comparison of current real-time acceleration data measured by the mobile device and acceleration profiles that are stored in the mobile device." EX1006, 2:40-46. Rubin further provides for using the same accelerometer to make an additional determination of the vehicle's context—namely, the vehicle type. EX1006, 5:17-54. These statements would have motivated a Skilled Artisan to implement the additional context detection of Rubin in the setting of Kim. EX1003, ¶210

Additionally, by the 2009 priority date of the '609 Patent, providing a wide variety of location- and context-aware services on portable electronic devices and become increasingly popular. *See* EX1006, 1:15-19 (disclosing a portable electronic device to detect acceleration data in vehicles); EX1007, Abstract (same). Additional context detection like the vehicle type detection of Rubin can be implemented in software, using the existing hardware already present on the portable electronic devices like Kim's terminal. A Skilled Artisan would therefore have been motivated to identify additional aspects of a user device's context to add

to the system of Kim, and adding the vehicle type detection of Rubin would have been one such obvious aspect to add. EX1003, ¶211.

It would have been obvious to combine Kim with the vehicle type detection functionality of Rubin because to do so would have been the arrangement of old elements (mobile device, accelerometer, predetermined patterns) with each performing the same function it had been known to perform (portability, measuring acceleration, and storing data on types of vehicles) and yielding no more than what one would expect from such an arrangement (pattern matching acceleration data with predetermined patterns of acceleration profiles for different vehicle types), as Rubin demonstrates. EX1003, ¶212.

2. Claim 7

Claim 7 depends from claim 6 and recites the additional clause of “*the method further comprises: determining that the individual is a driver based at least in part on at least one of the following: a) the type of the vehicle and b) acceleration, forces, velocity, location, and time.*” As discussed above, Kim in view of Rubin renders claims 6 obvious. *See* § VII.B.1.

As also explained above with respect to claim 5, Kim itself discloses the additional limitation of claim 7, which is satisfied by “*determining that the individual is a driver based at least in part on . . . the type of the vehicle*” or by “*determining that the individual is a driver based at least in part on . . .*

acceleration, forces, velocity, location, and time.” See § VII.A.5; EX1003, ¶214-215. In particular, Kim discloses the use of an accelerometer for determining that the user is driving a car. EX1005, <73>, <75>, Fig. 6A; EX1003, ¶215.

Accordingly, Kim in view of Rubin discloses this limitation.

EX1003, ¶¶213-215.

3. Claim 8

Claim 8 depends from claim 7 and recites the additional clause of “*wherein the at least one sensor is an accelerometer.*” As explained above, the limitations of claim 6 would have been obvious in view of Kim and Rubin, and the limitation of claim 7 is also disclosed by Kim. See §§ VII.B.1-VII.B.2. Kim in view of Rubin further discloses “*wherein the at least one sensor is an accelerometer.*” EX1003, ¶217.

As noted above, Kim discloses a “terminal” that uses an acceleration sensor to determine the operational state of a vehicle. For example, Kim discloses “[i]n this case, **the acceleration sensor 114,**” (i.e., “*the at least one sensor is an accelerometer,*”) EX1005, <73>; EX1003, ¶218. Rubin discloses “automatically activating applications based on acceleration data that can be captured by an **accelerometer in the mobile device,**” (i.e., “*wherein the at least one sensor is an accelerometer*”). EX1006 1:16-18; EX1003, ¶218.

4. Claim 15

Claim 15 depends from claim 1, and recites the additional clause of “*wherein the determining the one or more operational states of the vehicle further comprises determining a type of the vehicle wherein the type of the vehicle is at least one of the following a train and a bus.*” As discussed above, Kim discloses the elements of claim 1. *See* § VII.A.1. It would have been obvious to include this additional claim element in a method using the portable device of Kim in view of Rubin. EX1003, ¶249.

Rubin discloses using acceleration data pattern matching to detect when a user is riding in different vehicles. For example, Figure 1C discloses acceleration patterns for “**a mobile device carried by a user who is riding a train.**” *See* EX1006, 5:17-19, 5:31-33; EX1003, ¶250. The combination of Kim and Rubin therefore satisfies the additional limitation of claim 15. EX1003, ¶¶248-252.

It would have been obvious to combine the capability of Rubin’s portable electronic device with the terminal device of Kim, for the reasons noted above with respect to claim 6. *See* § VII.B.1.

C. Claims 10 and 12 Are Obvious Over Kim in View of Mitrovic (EX1008)

1. Claim 10

Claim 10 depends from claim 9, and recites the additional clause of “*wherein the at least one predetermined pattern recognition model comprises: at*

least one markov model generated for an average driver.” As discussed above, Kim discloses the elements of claim 9. *See* § VII.A.6.

It would have been obvious to include this additional claim element in a method using the portable device of Kim view of “Reliable Method for Driving Events Recognition” by Dejan Mitrovic (“Mitrovic”). As discussed by Dr. Hsieh-Yeeh, Mitrovic is prior art to the ’609 Patent. *See* EX1011.

Kim discloses a terminal which provides the methods recited above. *See* § VII.A.6. Kim further discloses “*determining one or more operational states of the vehicle based on the one or more predetermined criteria.*” *See* § VII.A.1.d; EX1003, ¶224.

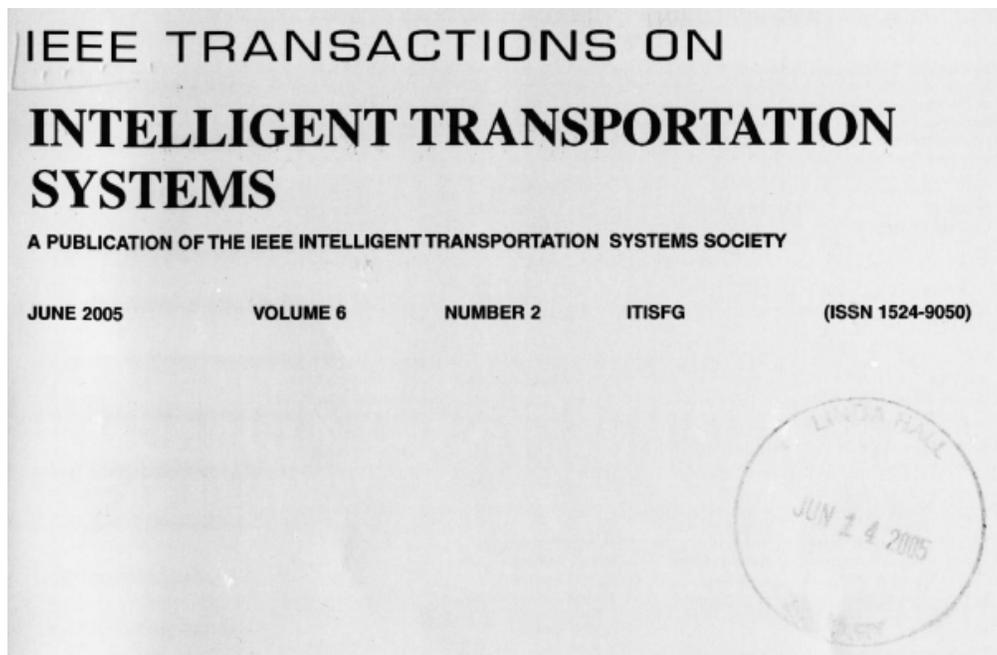
Kim discloses that the “acceleration sensor 114 and the microphone 112 of the sensor unit 110 . . . **detect a unique pattern of vibration and noise generated in the vehicle,**” EX1005, <73>, and then “the context recognition unit 120 of the terminal 100 acquires these physical signals through the sensor unit 110, and estimates the context by comparing them with **the pattern of the self-stored reference signals,**” (i.e., “*at least one predetermined pattern recognition model*”). EX1005, <74>. Kim thus discloses comparing sensor data with predetermined patterns to determine the operational state of a vehicle. EX1003, ¶225.

Mitrovic was published in IEEE Transactions on Intelligent Transportation Systems, Vol. 6, No. 2 (2005). EX1008, 198; EX1011, 9. As demonstrated

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below, Dr. Ingrid Hsieh-Yee concludes that Mitrovic was publicly accessible as early as June 14, 2005 and no later than June 21, 2005. EX1011, 18-19. Thus it could have been located by “persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, [could have] locate[d] it.” *Samsung Elecs. Co. v. Infobridge Pte. Ltd.*, 929 F.3d 1363, 1369 (Fed. Cir. 2019) (citation omitted). Mitrovic is thus is prior art to the ’609 Patent under 35 U.S.C. §§ 102(a) and 102(b).

First, Dr. Hsieh-Yee concludes that Mitrovic has a copyright record creation date in 2005 that was published on June 6, 2006, and registered on January 17, 2006. Second, Dr. Hsieh-Yee discovered that Mitrovic was physically available in the Linda Hall Library as early as June 2005, as evidenced by the date stamp on the inside cover of the journal.



EX1011, at 10. Further, Mitrovic was cited by other articles as early as September 2006. EX1011, 19, Ex. E. Accordingly, Skilled Artisans interested in the subject matter of Mitrovic, exercising reasonable diligence, could have located it.

Mitrovic discloses a “simple and reliable method for the recognition of driving events using hidden **Markov models**,” (i.e. “*at least one markov model generated for an average driver.*”) EX1008, 198. Mitrovic explains that the Markov models may be generated for several types of “driving events” such as “driving a vehicle along left and right curves” and “turning a vehicle left and right on intersections.” EX1008, 203; EX1003, ¶226.

The combination of Kim and Mitrovic therefore satisfies the limitations of claim 10, “*wherein the at least one predetermined pattern recognition model comprises: at least one markov model generated for an average driver.*” EX1003,227.

It would have been obvious to combine the capability of Kim’s portable terminal device with the pattern matching Markov models of Mitrovic. EX1003, ¶228.

Kim and Mitrovic are analogous art to the ’609 Patent because each is in the field of using electronic devices, such as acceleration sensors, to detect the motion of a vehicle. *Compare* EX1005, <85> (“The terminal 100 acquires physical signals from the GPS 113 and the acceleration sensor 114 through the sensor unit

110, and the context that the user is walking outdoors is estimated by comparing these with the patterns of the reference signals stored by the context recognition unit 120 itself.”) *with* EX1008, [0201] (“data acquisition hardware consists of a number of sensors, a data acquisition card, and a portable computer . . . accelerometers are set to measure longitudinal and lateral vehicle acceleration”) *with* EX1001, 5:37-40 (“vibration measurements are taken when the vehicles engine is not on or the portable device is not in a vehicle (e.g. individual is walking with the device)”); EX1003, ¶229.

Kim and Mitrovic are also both reasonably directed to determining the movement of a vehicle by comparing sensor measurements with predetermined patterns. Kim discloses that the “acceleration sensor 114 and the microphone 112 of the sensor unit 110 . . . detect a unique pattern of vibration and noise generated in the vehicle,” EX1005, <73> and then “the context recognition unit 120 of the terminal 100 acquires these physical signals through the sensor unit 110, and estimates the context by comparing them with the pattern of the self-stored reference signals.” EX1005, <74>. Mitrovic discloses using Markov models to determine “the driving event type to which a [driving data] belongs.” EX1008, 204. Accordingly, the use of the vehicle movement based Markov models disclosed in Mitrovic to inform the pattern recognition of vehicle movement in Kim would have been obvious to one of skill in the art. EX1003, ¶230.

For similar reasons, a Skilled Artisan would have had reason to make the combination. Kim discloses the need for specific tailoring of services on a portable device based on the state of the vehicle and a method of meeting that need by comparing measured signals with reference signals. EX1005, <74>, <82>. Mitrovic discloses that Markov models may be used as pattern recognition tools in determining driving events, such as turning a car. EX1008, 204. Further, both references contemplate using the same sensors (namely, accelerometers) to determine the movement of the vehicle. Compare EX1005, <73> with EX1008, [0201] (the “accelerometers are set to measure longitudinal and lateral vehicle acceleration”). These statements would have motivated a Skilled Artisan to implement the additional Markov model feature of Mitrovic in the setting of Kim. EX1003, ¶231.

Further, it would have been obvious to combine the terminal of Kim with the pattern matching Markov model of Mitrovic because to do so would have been the arrangement of old elements (portable device, a portable device’s accelerometer, Markov models) with each performing the same function it had been known to perform (portability, detecting movement, pattern matching) and yielding no more than what one would expect from such an arrangement (determination that the vehicle is moving in a certain manner), as Mitrovic demonstrates. EX1003, ¶232.

2. Claim 12

Claim 12 depends from claim 3, and recites “*wherein the at least one pattern recognition model comprises: at least one markov model.*” As discussed above, Kim discloses the elements of claim 3. *See* § VII.A.3.

Kim discloses a “terminal” which provides the methods recited in claim 3 above. *See* § VII.A.3. Mitrovic provides the use of “**Markov models**” for pattern recognition of driving events, as discussed in reference to claim 10. *See* § VII.C.1; EX1003,¶236. It would have been obvious to include this claim element in a method using the portable device of Kim in view of Mitrovic.

As discussed above in reference to claim 10, Kim and Mitrovic are analogous art to the ’609 Patent. *See* § VII.C.1. Moreover, a skilled artisan would have been motivated to combine the terminal of Kim with the Markov model of Mitrovic. *See* § VII.C.1; EX1003,¶238.

The combination of Kim and Mitrovic therefore satisfies the limitations of claim 10. EX1003,¶¶235-239.

D. Claims 16 and 18-19 Are Obvious Over Kim in View of Barbera (EX1007)

1. Claim 16

Claim 16 depends from claim 1, and recites the additional clause of “*wherein the performing the at least one action when the at least one operational state indicates that the vehicle is in the moving state further comprises one of the*

following: a. disabling usage of the portable device when the at least the one operational state indicates the vehicle is in the moving state and the individual operates the portable device; b. disabling entering text when the at least the one operational state indicates the vehicle is in the moving state and the individual operates the portable device; c. disabling making voice calls when the at least the one operational state indicates the vehicle is in the moving state and the individual operates the portable device; d. making a connection with another phone when the at least the one operational state indicates the vehicle is in the moving state and the individual operates the portable device; e. making a connection to the known internet address and sending information on the one or more determined operational states.”

As discussed above, Kim discloses the elements of claim 1. See § VII.A.1. It would have been obvious to include this claim element in a method using the portable device of Kim in view of EX1007, U.S. Patent No. 7,505,784 to Barbera, et al. (“Barbera”). EX1003, ¶255. Barbera is prior art under 35 U.S.C. §§102(a)-(b). EX1003, ¶104. Because the claim elements recite “*comprises one of the following*” it is sufficient to show one of the listed elements to disclose the claim. See *Brown*, 265 F.3d at 1351.

Barbera discloses a “portable electronic device” that “includes a safety feature configured to prevent at least some forms of use of the device when the

user is traveling beyond a speed threshold.” EX1007, Abstract. Barbera’s invention was designed to address “safety concerns associated with using portable electronic devices (e.g. cellular telephones) while driving a vehicle.” EX1007, 1:14-16; EX1003, ¶256. Barbera discloses a “speed detector (30)” which is “operable to determine the speed at which the portable electronic device is traveling.” EX1007, 2:28-30. Barbera discloses “[v]arious methods and devices for accomplishing such speed detection,” including land-based signal triangulation techniques. EX1007, 2:33-64; EX1003, ¶257.

Barbera also discloses configuring “threshold logic” within the portable electronic device “to compare the speed indicated by the signal communicated by the speed detection logic (50) to a threshold value” and if “the speed threshold has been exceeded,” a signal “is configured to disable one or more functions of the portable electronic device. EX1007, 4:10-16; EX1003, ¶260.

In one embodiment, Barbera discloses entirely disabling usage of the portable device if the “speed is in excess of the threshold,” explaining that “[o]ne exemplary response **is to simply turn off the portable electronic device (20)**, as shown in block (200). For instance, **all further use of the portable electronic device (20) may be prevented until the speed falls back below the threshold**” (i.e., “*disabling usage of the portable device when the at least the one operational*

state indicates the vehicle is in the moving state”). EX1007, 5:63-67; EX1003, ¶261.

Barbera also discloses disabling voice or text applications on a mobile device in response to the operational state of the vehicle. In particular, Barbera discloses a device that enables “**voice communication and text messaging**. In this embodiment, **transmission of such voice and text is blocked as part of a function disabling response (210).**” EX1007, 6-11. Barbera therefore at least discloses “*disabling usage of the portable device when the at least the one operational state indicates the vehicle is in the moving state and the individual operates the portable device.*” EX1003, ¶262.

Barbera further discloses sending notifications to another cell phone, such as a parent’s, when the user attempts to use the mobile device: “[f]or instance, referring back to the parent-child example above, **a system may be configured to provide an alert (e.g., e-mail, voice mail, text message, etc.) to the parent when it is detected that the child has attempted to use the cell phone while traveling beyond the speed threshold.**” EX1007, 12:24-29. Barbera therefore discloses at least the limitation of “*making a connection with another phone when the at least the one operational state indicates the vehicle is in the moving state and the individual operates the portable device.*” EX1003, ¶263.

Accordingly Kim in view of Barbera discloses the elements of claim 16. EX1003,¶264. It would have been obvious to combine the capability of Barbera's portable electronic device with the terminal device of Kim. EX1003,¶265.

Kim and Barbera are analogous art to the '609 Patent because each is in the field of portable electronic devices generally, and specifically in the application of using a portable electronic device to detect the motion of a vehicle. Moreover, all three references concern taking actions to change the services provided by the portable electronic device based on whether the device is determined to be in a moving vehicle. EX1005, ¶75; *compare* EX1007, Abstract (“A portable electronic device includes a safety feature configured to prevent at least some forms of use of the device when the user is traveling beyond a speed threshold In one embodiment, the device is a cell phone configured to disable the transmission and reception of voice and text...”) *with* EX1001, 1:48-51 (“[a]nother related problem deals with blocking certain actions by a user if the user is moving or speeding, for example, blocking texting on cell phones while the user is moving in a car”); EX1003,¶266.

Kim and Barbera are also reasonably directed to the use of a speed determination to take action to change the services provided by the portable electronic device. Kim discloses using the GPS in the terminal to calculate “the approximate speed,” and thereby estimate “the driving state that the vehicle 200 is

currently in.” EX1005, <76>. Although Kim does not explicitly suggest comparing that determined speed to a predetermined value like Barbera, Kim contemplates using the components of a portable device to determine vehicle speed. Accordingly, use of the additional method of Barbera in Kim to compare the determined speed to a threshold, including possibly based on the location of the device, would therefore have been well within the level of ordinary skill in the art, would not have resulted in any unpredictable results and could have been readily accomplished without undue experimentation and with a reasonable expectation of success. EX1003, ¶267.

For similar reasons, a Skilled Artisan would have had reason to make the combination. Kim discloses a need for “context-aware service” which “automatically selects and provides services that meet the user’s environment.” EX1005, <11>. Kim also discloses the need for specific tailoring of services on a portable device based on whether the user is driving a vehicle. EX1005, <75>. Barbera explains that “[t]here are a variety of safety concerns associated with using portable electronic devices (e.g., cellular telephones) while driving a vehicle.” EX1007, 1:14-16. In response to these concerns, Barbera provides a “safety feature” for a “portable electronic device” for this specific context, by changing the available set of services on the device. EX1007, Abstract. Moreover, other inventors had begun to patent such safety devices before the ’609 Patent was filed.

For example, the disclosure in Irani notes that “[c]ellular phones are the fastest growing form of communication The same features of portability and convenience that make them so ubiquitous can also in certain circumstances make them a hazard such as driving a car at high speeds. EX1010, [0006]-[0007].

The “need to curtail cellphone use while participating in a secondary equally distracting activity such as driving is clearly necessary.” EX1010, [0013]; *see also* EX1009, [0003]. These statements would have motivated a Skilled Artisan to implement the additional safety feature of Barbera in the setting of Kim.

EX1003, ¶268.

Additionally, by the 2009 priority date of the ’609 Patent, providing a wide variety of location- and context-aware services on portable electronic devices had become increasingly popular. EX1006, 1:15-19 (disclosing a portable electronic device to detect acceleration data in vehicles); EX1007, Abstract (same).

Additional features like the safety feature of Barbera can be implemented in software, using the existing hardware already present on the portable electronic devices like Kim’s terminal. A Skilled Artisan would therefore have been motivated to identify additional context-aware features to add to the system of Kim, and adding the safety feature of Barbera would have been one such obvious feature to add. EX1003, ¶269.

It would have been obvious to combine Kim with the speed detection and comparison technique of Barbera because to do so would have been the arrangement of old elements (portable device, a portable device's accelerometer, speed detector) with each performing the same function it had been known to perform (portability, detecting movement, determining speed) and yielding no more than what one would expect from such an arrangement (determination that the vehicle is moving at a certain speed), as Barbera demonstrates. EX1003, ¶270.

2. Claim 18

Claim 18 depends from claim 17 and recites the additional clause of “*wherein the determining of the position of the portable device comprises: determining the position of the portable device in relation to a driver's seat of the vehicle.*” As discussed above, Kim discloses claim 17. See § VII.A.10. Further, as discussed above Kim discloses the elements of claim 18. See § VII.A.11.

To the extent Patent Owner argues Kim does not explicitly disclose this limitation, it is rendered obvious by Kim in view of Barbera.

Barbera discloses the use of GPS data to determine the position of the portable device within the vehicle, including in relation to the position of the driver's side of the vehicle. For example, the “GPS technology **permits the determination of whether a user is closer to the middle of the street or the**

edge of the street, the position of the user in a car (e.g., driver side or passenger side) may be inferred.” EX1007, 9:22-29; EX1003, ¶281.

As discussed above, Kim and Barbera are analogous art to the '609 Patent and it would have been obvious to combine the functionality disclosed in Barbera with the portable “terminal” of Kim. See § VII.D.1.

Accordingly, the combination of Kim and Barbera discloses this limitation EX1003, ¶¶280-282.

3. Claim 19

Claim 19 depends from claim 18, and recites “*wherein the determining the position of the portable device in relation to a driver’s seat of the vehicle comprises: determining that the vehicle is in a moving state and the individual is a driver of the vehicle.*” As discussed above, Kim discloses both claim 18 and claim 19. See §§ VII.A.11-VII.A.12. To the extent Patent Owner argues Kim does not explicitly disclose this limitation, it is obvious in view of Kim and Barbera. EX1003, ¶285.

Barbera discloses the use of GPS data to determine the position of the portable device within a moving vehicle, including in relation to the position of the driver’s side of the vehicle. For example, the “the resolution of the GPS technology **permits the determination of whether a user is closer to the middle of the street or the edge of the street, the position of the user in a car (e.g.,**

driver side or passenger side) may be inferred.” EX1007, 9:22-29;
EX1003, ¶286.

Barbera discloses that the vehicle is moving during this determination:
“[s]uch **intra-vehicle positioning may be used to prevent the disablement of cell phone features despite a non-driving user’s traveling speed being beyond the threshold.**” EX1007, 9:29-32; EX1003, ¶287.

Accordingly, the combination of Kim and Barbera discloses “*determining that the vehicle is in a moving state and the individual is a driver of the vehicle.*” EX1003, ¶¶285-288.

As discussed above with reference to claim 16, Kim and Barbera are analogous art to the ’609 Patent. *See* § VII.D.1. A skilled artisan would have been motivated to combine the disclosures of Kim and Barbera. *See* § VII.D.1; EX1003, ¶268. Specifically, both the relevant disclosures in Kim and Barbera are directed to determining that the user of a portable device is the driver of a vehicle. *See* EX1005, <73>; EX1007, 9:22-29; EX1003, ¶289.

E. Claim 20 is Obvious Over Kim in view of Barbera, in further view of Kohli.

Claim 20 depends from claim 1, and recites the additional clause of
“*wherein the method further comprises: determining that the vehicle is in the moving state and the individual is a driver of the vehicle, wherein the determining is based at least in part on: 1) the one or more operational states of the vehicle,*

identifying that the vehicle turns a corner, and 2) the one or more predetermined criteria.” As discussed above, Kim discloses the elements of claim 1. See § VII.A.1. It would have been obvious to use the additional claim elements of claim 20 in a method using the portable device of Kim in view of Barbera, and in further view of U.S. Patent No. 6,236,937 to Sanjai Kohli (Kohli). EX1003, ¶291. Kohli is prior art under 35 U.S.C. §§ 102(a)-(b). EX1003, ¶124.

Kim discloses detecting that a user has changed states to being in a vehicle that is traveling, for example “**a context inside the vehicle 200** in which the user who has terminal 100 **is travelling is recognized through the terminal 100** and switches to a vehicle service mode to provide a vehicle internal service to the user,” EX1005, <33>. Kim therefore discloses “*determining that the vehicle is in the moving state*” based upon “**unique pattern of vibration and noise generated in the vehicle**” (i.e., “*one or more predetermined criteria*”). EX1005, <74>; EX1003, ¶292.

Barbera discloses that “**the determination of whether a user is closer to the middle of the street or the edge of the street**” and from this information “**the position of the user in a car (e.g., driver side or passenger side) may be inferred.**” EX1007, 9:25-30. Barbera therefore discloses determining that “*the individual is a driver of the vehicle.*” EX1003, ¶293.

Kohli discloses a “GPS receiver” which tracks “position information” of a vehicle including its deviation from a roadway. EX1013, Abstract, 3:5-9.

Specifically, Kohli discloses that “[t]urn detection may be accomplished by monitoring changes in the vehicle vector velocity derived from changes in the **GPS derived position information.**” EX1013, 3:5-9; EX1003, ¶294. Further, Kohli includes a “[t]urn detector” that operates to “**determine the expected position of car 10 along track 62 based on the current GPS position information.**”

EX1013, 9:45-52; EX1003, ¶294.

Kohli explains that “[d]etection of turns from GPS signals may easily be accomplished” and discloses “**the use of turn information for updating the last known position information.**” EX1013, 10:9; EX1003, ¶294. Kohli thus discloses using positional information to determine when a vehicle is turning. The combination of the terminal of Kim, the driver detecting functionality of Barbera, and the turning identification functions of Kohli therefore discloses the limitations of claim 16. EX1003, ¶¶290-295. It would have been obvious to combine the capability of Barbera’s portable electronic device with the terminal device of Kim and with the turn detection system of Kohli. EX1003, ¶296.

As discussed above, Kim and Barbera are analogous art to the ’609 Patent. See §§ VII.C.1, VII.D.1; EX1003, ¶¶229, 266. Kohli is analogous art because it also relates to the detection of motion in vehicles through the use of devices that

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include sensors and position information. *Compare* EX1013, 5:7-10 with EX1001, 2:37-40. Further, both Kim and Barbera disclose the use of GPS technology in determining the position of a vehicle. *See* EX1005, <12>; EX1007, 2:37-38.

These disclosures would have motivated a Skilled Artisan to utilize the turn detection functionality of Kohli in combination of Kim and Barbera.

EX1003, ¶297.

VIII. The Board Should Not Exercise Its Discretion to Deny Institution.

Each factor regularly considered under § 314(a) weighs against denying institution of this proceeding. *General Plastics* factors (1)-(5), for example, favor Petitioner, as this is the only IPR filed against the '609 Patent, and (6) Petitioner's focused grounds preserve the Board's "finite resources" such that (7) the Board can satisfy the requirements of 35 U.S.C. § 316(a)(11). *See Gen. Plastic Indus. Co. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19 (PTAB Sept. 6, 2017) (precedential: §II.B.4.i).

Factors considered under § 314(a) related to parallel district litigations also weigh against denying institution of this proceeding. For example, each of factors (1)-(4) and (6) of *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (March 20, 2020) (precedential) are either neutral or weigh against the Board exercising its discretion to deny institution, as in the district court litigation noted above no trial has been scheduled. Based on that court's usual time to trial in similarly complex

cases, Petitioner does not expect a trial to occur until well after any final written decision would issue in this proceeding. In addition, Judge Wood, who is presiding over the district court case, routinely grants stays pending resolution of *inter partes* review after institution. Institution should therefore not be denied based on Section 314(a) for these reasons as well.

Finally, Petitioner's challenges do not advance "the same or substantially the same prior art or arguments previously ... presented to the Office." *See* 35 U.S.C. § 325(d); *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 (Dec. 15, 2017) (precedential: §III.C.5, ¶1). The Examiner had neither the primary reference relied on here (Kim), nor any similar reference, and also did not have the analysis of Dr. Michalson.

IX. CONCLUSION

The claims of the '609 Patent are unpatentable and should be cancelled.

Dated: July 20, 2021

Respectfully Submitted,

/Scott Border/

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CERTIFICATE OF COMPLIANCE

I hereby certify that this petition complies with the type-volume limitations of 37 C.F.R. §42.24, because it contains 13876 words (as determined by the Microsoft Word word-processing system used to prepare the Petition), excluding the parts of the Petition exempted by 37 C.F.R. §42.24.

Dated: July 20, 2021

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Petition for *Inter Partes* Review of U.S. Patent No. 9,152,609

PETITION FOR INTER PARTES REVIEW

OF U.S. PATENT NO. 9,152,609

Attachment A:

Proof of Service of the Petition

CERTIFICATE OF SERVICE

I hereby certify that on July 20, 2021, a copy of the Petition, including all attachments, appendices, and exhibits thereto, has been served in its entirety on the patent owner and counsel for patent owner, via Federal Express, at the following:

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Dated: July 20, 2021

Respectfully submitted,

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