

UNITED STATES PATENT TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FORD MOTOR COMPANY
Petitioner,

v.

AUTOCONNECT HOLDINGS, LLC
Patent Owner.

U.S. Patent No. 9,020,697 to Ricci et al.

Case No.: IPR2025-01342

**CORRECTED PETITION FOR *INTER PARTES* REVIEW
UNDER 35 U.S.C. §311 *ET SEQ.* AND 37 C.F.R. §42.100 *ET SEQ.*
(U.S. PATENT NO. 9,020,697)**

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List of Exhibits

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1001	U.S. Patent No. 9,020,697 (“the ’697 Patent”)
1002	U.S. Patent No. 9,020,697 Certified File History (“the ’697 File History”)
1003	Expert Declaration of Todor Cooklev
1004	Todor Cooklev Curriculum Vitae
1005	Complaint, <i>AutoConnect Holdings LLC v. Ford Motor Company</i> , Case No. 1:24-cv-01327-JCG (D. Del)
1006-1009	<i>Intentionally left blank</i>
1010	U.S. Patent No. 8,768,539 B1 to Clement (“Clement”)
1011	U.S. Patent No. 7,388,466 B2 to Ghabra (“Ghabra”)
1012	U.S. Patent Application Pub. No. 2012/0092129 A1 to Lickfelt (“Lickfelt”)
1013	U.S. Patent Application Pub. No. 2011/0093153 to Moinzadeh (“Moinzadeh”)
1014-1049	<i>Intentionally left blank</i>
1050	Bosch Handbook, (Automotive Handbook October 2004 6 th Edition) (“Bosch”)
1051	IEEE Dictionary, (IEEE 100 The Authoritative Dictionary of IEEE Standards Terms 2000 7 th Edition) (“IEEE Dictionary”) (Excerpts)
1052	“Specification of The Bluetooth System” (June 30, 2010). Version 4.0 (Volumes 0-6) Available at https://www.bluetooth.com/specifications/specs/core-specification-4-0/ (Accessed June 27, 2025) (“Bluetooth Specification”)
1053	Hossain et al., “A Comprehensive Study of Bluetooth Signal Parameters for Localization,” 2007 IEEE 18 th International Symposium on Person, Indoor and Mobile Radio Communications Available at https://www.ieeexplore.ieee.org/document/4394215 (“Hossain”)

Exhibit No.	Description
1054	McCartt, et al. “Driver Cellphone and Texting Bans in the United States: Evidence of Effectiveness,” Engaged Driving Symposium Annals of Advances in Automotive Medicine, March 31, 2014 (“McCartt”) Available at https://pmc.ncbi.nlm.nih.gov/articles/PMC4001674/ (Accessed July 1, 2025.)
1055	NHTSA Traffic Safety Facts Research Note “Distracted Driving 2010” published September 2012. Available at https://www.nrd.nhtsa.dot.gov/CATS/index.aspx (Accessed June 24, 2025) (“NHTSA”)
1056	Peterson, Andrew, “Do not disturb, Ford Fights Distracted Driving with Limited In-Motion Sync Access,” July 12, 2010. Available at https://www.motortrend.com/news/163-news100712-ford-sync-do-not-disturb (Accessed June 24, 2025) (“Motor Trend”)
1057	Allen, Leslie “Ford launches parental control technologies,” October 7, 2008. Available at https://www.autonews.com/article/20081007/ZZZ_SPECIAL/310079921/ford-launches-parental-control-technologies/ (Accessed June 24, 2025) (“Auto News”)
1058	Ghangurde, Mujund “Ford SYNC and Microsoft Windows Embedded Automotive Make Digital Lifestyle a Reality on the Road,” <i>SAE International</i> , Volume 3, Issue 2, October 19, 2010 SAE2010-01-02319 (Accessed April 25, 2025) (“Ghangurde”)
1059	Austin, Michael “Ford introduces Next-Gen Connectivity Suite Called MyFord; Should be Awesome,” January 6, 2010. Available at https://www.caranddriver.com/news/a15128939/ford-introduces-next-gen-connectivity-suite-called-myford-should-be-awesome-car-news/ (“Car and Driver”)
1060	<i>Intentionally left blank</i>
1061	Ford SYNC Supplemental Guide, November 2007 (“SYNC Guide 2007”)
1062	Ford SYNC Supplemental Guide, January 2010 (“SYNC I Guide 2010”)

Exhibit No.	Description
1063	Saltzstein, William E. “Bluetooth: The Future of Wireless Medical Technology?” February 1, 2002. Available at https://www.mddionline.com/new-technologies/bluetooth-the-future-of-wireless-medical-technology- (Accessed June 30, 2025) (“MDDI”)
1064	MyFord Touch Ford User Guide Ford Motor Company, February 2012 (“MyFord Touch Guide”)
1065	SUSE LINUX – Administration Guide. Published by SUSE LINUX AG, 2004. (“Linux”)
1066-1099	<i>Intentionally left blank</i>
1100	United States District Courts – National Judicial Caseload Profile, March 2025

Mandatory Notices under 37 C.F.R. §42.8

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

Petitioner certifies that Ford Motor Company (“Petitioner”) is the real party-in-interest.

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

Petitioner identifies the following related judicial matter: *AutoConnect Holdings, LLC v. Ford Motor Company*, 1:24-cv-01327-JCG (D. Del) (pending) served December 6, 2024. U.S. Patent No. 9,020,697 is being asserted in this proceeding, along with twelve other patents: U.S. 9,020,491; U.S. 9,082,239; U.S. 9,098,367; U.S. 9,116,786; U.S. 9,123,186; U.S. 9,140,560; U.S. 9,147,296; U.S. 9,147,297; U.S. 9,173,100; U.S. 9,290,153; U.S. 10,862,764; and U.S. 11,163,931.

Petitioner is also aware that U.S. Patent No. 9,020,697 is being asserted in *AutoConnect Holdings LLC v. Toyota Motor Corporation et al.* 2-24-cv-00802 (EDTX) (pending) filed October 3, 2024.

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

The Petitioner identifies the following lead and back-up counsel:

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An appropriate Power of Attorney is filed concurrently herewith.

Service Information - 37 C.F.R. §42.8(b)(4)

Service information for lead and back-up counsel is provided in the designations above. Petitioner hereby consents to service by email at the following email address: FPGP0147IPR@brookskushman.com.

Fees - 37 C.F.R. §42.15(a)

The filing fees associated with this Petition are being charged to Deposit Account 06-1510. The Board is authorized to charge any additional fees or credit any refunds pertaining to this Petition to Deposit Account 06-1510.

I. Introduction and Technology Overview

Petitioner Ford Motor Company (“Ford”) respectfully requests *inter partes* review of claims 1-21 of U.S. Patent No. 9,020,697 (“the ’697 Patent”, Ex. 1001). The supporting Declaration of Dr. Todor Cooklev is filed as Ex. 1003.

The ’697 Patent is one of thirteen patents Patent Owner (“AutoConnect”) asserted against Petitioner in litigation. (Ex. 1005.) The ’697 Patent is directed to a vehicle communication system with a device discovery daemon (computer program) that limits access to onboard vehicle network functionality based on the location of a mobile device. Such technology was well known in the art at the time of the alleged invention. *See e.g.*, Clement (Ex. 1010), and Lickfelt (Ex. 1012).

By the mid-2000s, as mobile phones became more advanced, vehicle systems that interacted with mobile devices became widely available. Such vehicle systems provided information and entertainment (infotainment) and included user convenience features and features to address safety and security. (Ex. 1003, ¶ 89.) For safety reasons, states began enacting legislation to ban cellphone use during driving. For example, New York banned handheld cell phone use while driving in 2001, and Washington banned texting while driving in 2008. (Ex. 1054, 1; Ex. 1003, ¶ 113; Ex. 1055, 4.)

Petitioner released its first SYNC infotainment system in 2007 and SYNC 2 was released in 2010. Both SYNC systems included user convenience features and

features to limit driver access to their mobile phone and certain vehicle system functionality while the vehicle was in motion, e.g., hands-free calling, voice activated music control, and text-to-voice online messaging control. (Ex. 1003, ¶¶ 90-92, 114-115; Ex. 1058, 101-103; Ex. 1059, 1-2; Ex. 1061, 2-5, 38-39, 43-44; Ex. 1062, 2, 30-32; Ex. 1064, 2-9; 1-4; Ex. 1057, 1-6; Ex. 1056, 1-4.)

The '697 Patent claims start with well-known strategies for limiting mobile device access to vehicle network functionality and then add other common features, such as the computational device determining its own location (claims 2, 9, 16), device discovery (claims 3, 10, 17), and device positioning (claims 4, 6, 7, 11, 13, 14, 18, 20, 21). (Ex. 1003, ¶ 71.) Mobile device discovery and positioning techniques were well known for Bluetooth communication and Passive-Entry Passive-Start (PEPS) systems. (Ex. 1003, ¶¶ 93-95, 97-107, 119-121; Ex. 1052, Vol. 2, 150-151, 160-163; Ex. 1053, 5.)

As set forth in detail below, the challenged claims of the '697 Patent are obvious over various references in the prior art—none of which were considered during the examination of the '697 Patent. (Ex. 1003, ¶¶ 73-77.) Ground 1 demonstrates a prior art permission management system that limits access to vehicle system functionality based on the location of a mobile device within a vehicle (Ex. 1003, ¶¶ 152-292); and Ground 3 demonstrates a prior art passive entry system that limits access to vehicle system functionality based on the location of a mobile device

external to the vehicle (Ex. 1003, ¶¶ 363-475.) Grounds 2 and 4 demonstrate how and why it would have been obvious to modify a vehicle system to initiate device discovery in response to a triggering event, e.g., to improve user convenience and security, and to reduce battery consumption. (Ex. 1003, ¶¶ 293-362, 476-554.)

The litigation filed by Patent Owner is in its early pleadings stage, and trial will likely occur (if at all) in late 2027, long after the projected final decision here. (See Ex. 1100, 14.) Additionally, although the '697 Patent issued over ten years ago, Petitioner had settled expectations that it would not be asserted against Petitioner because, *inter alia*, Patent Owner had not commercialized, asserted, marked, licensed, or otherwise applied the '697 Patent in the automotive technology space, if at all, before contacting Petitioner in December 2023.

II. Grounds for Standing Requirements under 37 C.F.R. §42.104

A. Grounds for Standing - 37 C.F.R. §42.104(a)

Pursuant to 37 C.F.R. §42.104(a), Petitioner certifies that the '697 Patent is available for IPR and that Petitioner is not barred or estopped from requesting IPR.

B. Challenged Claims - 37 C.F.R. §42.104(b)(1)

Petitioner requests *inter partes* review for claims 1-21 of the '697 Patent and requests that the Patent Trial and Appeal Board ("PTAB") find these claims as unpatentable.

C. Prior Art Relied Upon

The following prior art references are all prior art to the earliest claimed priority date of the '697 Patent of April 15, 2013¹²:

- Clement – U.S. 8,768,539 B1 (Ex. 1010) filed September 28, 2012, issued July 1, 2014 (AIA 35 U.S.C. §102(a)(2))
- Ghabra – U.S. 7,388,466 B2 (Ex. 1011) issued June 17, 2008 (AIA 35 U.S.C. §§102(a)(1) and 102(a)(2))
- Lickfelt – U.S. 2012/0092129 A1 (Ex. 1012) published April 19, 2012 (AIA 35 U.S.C. §§102(a)(1) and 102(a)(2))

Clement, Ghabra, and Lickfelt are not cited on the '697 Patent.

D. Grounds of Challenge – 37 C.F.R. §42.104(b)(2)

The grounds of unpatentability presented in this petition are as follows:

Ground	Basis	References	Claims Challenged
1	§103	Clement	1-2, 4-9, 11-16 and 18-21
2	§103	Clement and Ghabra	3, 10 and 17

¹ AIA Sections 102, 103 and 112 apply.

² Petitioner reserves the right to argue one or more claims are not entitled to this date in district court.

Ground	Basis	References	Claims Challenged
3	§103	Lickfelt	1-2, 4, 6-9, 11, 13-16, 18 and 20-21
4	§103	Lickfelt and Ghabra	3, 5, 10, 12, 17 and 19

There is a reasonable likelihood that at least one Challenged Claim is unpatentable as explained herein. Petitioner requests review of the Challenged Claims, and judgment finding them unpatentable.

III. Person of Ordinary Skill in the Art (POSA)

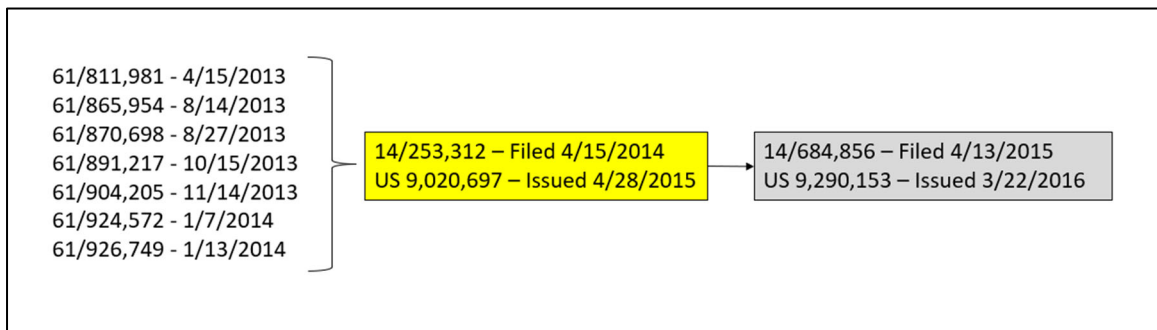
A person of ordinary skill in the art (POSA) of the '697 Patent would have had, as of April 15, 2013, a Bachelor's degree in Electrical Engineering, Mechanical Engineering, or an equivalent degree with at least two years of experience in communication systems, vehicle sensor systems, electronic user interface systems, or related technologies. Additional industry experience could make up for less education and vice versa. (Ex. 1003, ¶¶ 43-46.)

IV. The Challenged '697 Patent

A. Priority Claim

The '697 Patent matured from U.S. patent application serial no. 14/253,312 filed April 15, 2014. The '697 Patent claims priority to seven provisional patent

applications including the earliest filed U.S. provisional patent application serial no. 61/811,981 that was filed on April 15, 2013. U.S. patent application serial no. 14/684,856 was filed on April 13, 2015 as a continuation of the '697 Patent, and issued on March 22, 2016 as U.S. 9,290,153. The '153 Patent is also asserted in the related litigation. A graphic of the '697 Patent Family is provided below, with the '697 Patent highlighted in yellow and the related '153 Patent is shaded in gray. (Ex. 1003, ¶¶ 48-49.)



The '697 Patent Family

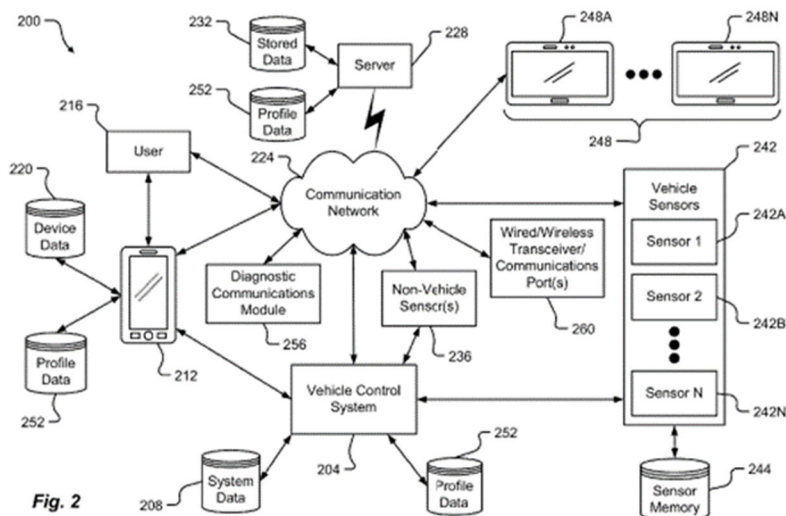
B. Overview

The '697 Patent relates to “[m]ethods and systems for a device discovery daemon that bases access of a communication device to an on board vehicle network on device location.” (Ex. 1001, Abstract.) The '697 Patent explains that such access refers to “vehicle functionality and/or features to be provided and/or restricted to a user” based on “the location of the device 212, 248 relative to the vehicle 104” and that such “communications systems and/or devices...provide for an enhanced user experience making the automobile more useful and more efficient (Ex. 1001, 34:3-

5,23:19-30.) The '697 Patent also seeks to “reduce driver distractions while enabling the driver to perform permissible computational tasks” and “not only comply with prevailing legal requirements but also enhance passenger enjoyment.” (Ex. 1001, 15:11-17; Ex. 1003, ¶¶ 50-54.)

The '697 Patent discloses a “vehicle control system 204 [that] may communicate with a device³ or user interface 212, 248.” (Ex. 1001, 24:13-14, Fig. 2.) “The device 212, 248 can be a mobile device...that is either permanently located in or temporarily associated with...the vehicle 104” and “the vehicle control system 204 can interface with the device 212, 248 and leverage the device's computing capability to provide one or more of the features or functions.” (Ex. 1001, 24:21-29; Ex. 1003, ¶¶ 55-56.)

³ The '697 Patent refers to the devices 212, 248 using a plurality of interchangeable terms, such as a “mobile”, “portable”, “communication” and “computational” device. (Ex. 1001, 86:48-50, 16:64-17:8.)



Ex. 1001, Fig. 2

“The vehicle control system 204 may also communicate with or through a communication network 224” that “can represent any type of wireless and/or wired communication system that may be included within the vehicle 104 or operable to communicate outside the vehicle 104” such as “a Bluetooth® wireless system.” (Ex. 1001, 25:47-60; Ex. 1003, ¶ 57.)

The '697 Patent discloses accessing vehicle PEPS system functionality from an external mobile device. (Ex. 1001, 34:3-13, Fig. 5A; Ex. 1003, ¶¶ 58-59.)

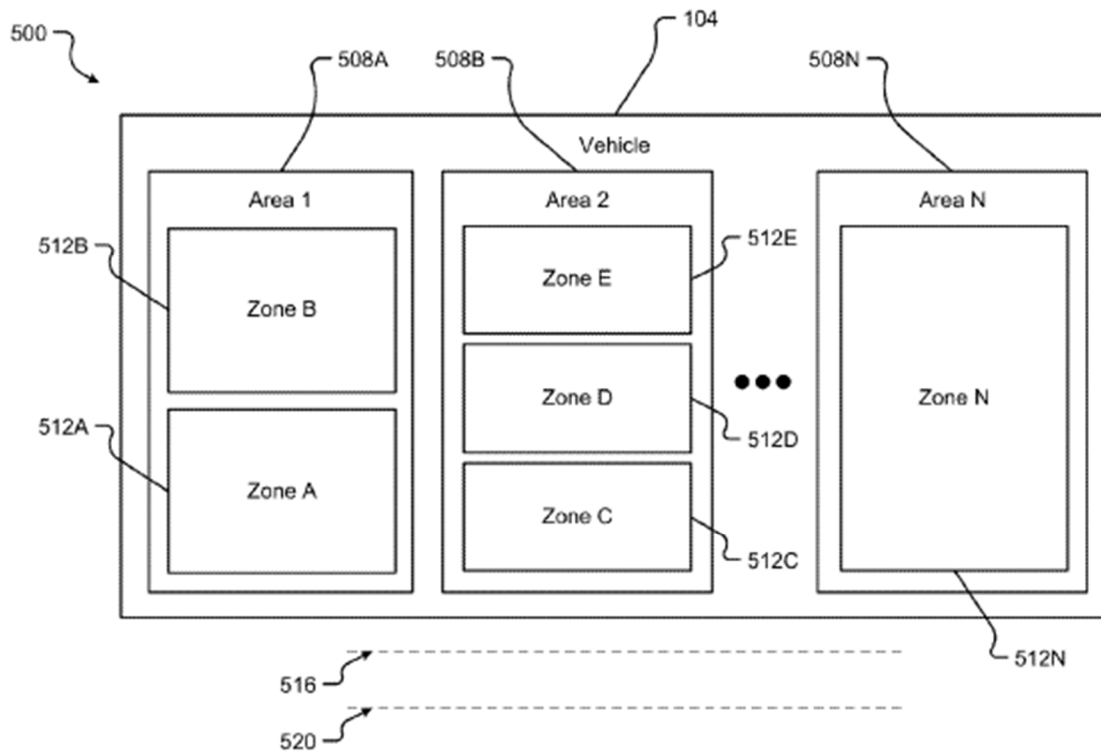


Fig. 5A

Ex. 1001, Fig. 5A

The '697 Patent also discloses accessing vehicle system functionality from an internal mobile device. (Ex. 1001, 35:22-28, Fig. 5B; Ex. 1003, ¶ 60.)

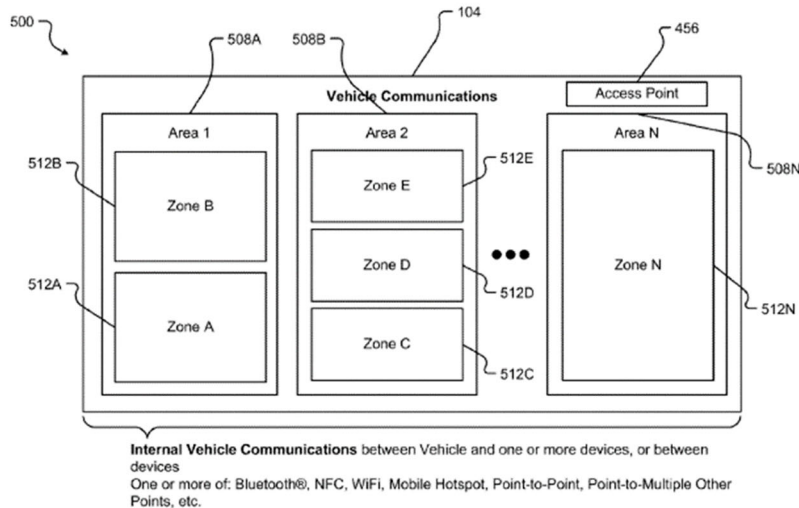


Fig. 5B

Ex. 1001, Fig. 5B

The '697 Patent further discloses a “device discovery daemon 1020 [that] may be a computer program that runs as a background process that can discover new devices that connect with the network 356 or communication subsystem 1008 or devices that disconnect from the network 356 or communication subsystem 1008.” (Ex. 1001, 57:45-49.) Further, “[t]he device discovery daemon 1020 can ping the network 356 (the local subnet) when the vehicle 104 starts, when a vehicle door opens or closes, or upon the occurrence of other events.” (Ex. 1001, 57:49-52; Ex. 1003, ¶ 61.)

The '697 Patent describes “an operation of the device discovery daemon 1020” with reference to Figure 20. (Ex. 1001, 91:60-61.) “[T]he device discovery daemon 1020 detects a computational device attempting to connect to or otherwise connectable with the vehicle network 356 or communication subsystem 1008 and,

applying rules, determines when it is appropriate to connect with the computational device.” (Ex. 1001, 91:62-67.) “In step 2000, the device discovery daemon 1020 detects a computational device connectable with the vehicle network 356 or communication subsystem 1008.” (Ex. 1001, 92:36-38; Ex. 1003, ¶ 62.)

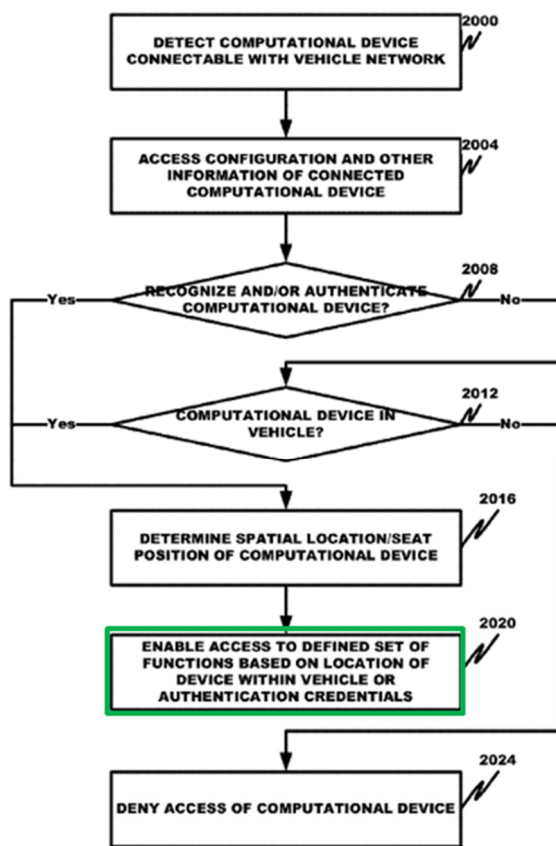


Fig. 20

Ex. 1001, Fig. 20 (Annotated)

As illustrated in step 2020 of Figure 20 above, the device discovery daemon “ENABLES ACCESS TO [a] DEFINED SET OF FUNCTIONS BASED ON [the] LOCATION OF [the] DEVICE.” (Ex. 1001, 96:26-34.) At step 2024, the device

discovery daemon 1020 denies access to the defined set of functions if the device is outside a defined area or zone. (Ex. 1001, 96:35-42; Ex. 1003, ¶¶ 63-66.)

The '697 Patent discloses that “[a] level of confidence can be assigned by the device discovery daemon 1020 to the computational device indicating a likelihood or probability that the computational device is located within the passenger compartment.” (Ex. 1001, 93:56-59.) “This level of confidence can be based on consideration and analysis of multiple [] factors.” (Ex. 1001, 93:59-63; Ex. 1003, ¶¶ 67-68.)

Independent claims 1, 8, and 15 of the '697 Patent are directed to limiting access to vehicle network functionality based on the location of the “*computational device*.” (Ex. 1003, ¶ 69.) Independent claim 1 is representative of claims 8 and 15 and is reproduced below:

1[pre]. A method, comprising:

[1a] (a) determining, by a microprocessor executable device discovery daemon, that a computational device is connected to or attempting to connect to a network and/or communication subsystem of a vehicle;

[1b] (b) in response, determining, by the device discovery daemon, whether the computational device is located within a predetermined area and/or zone of the vehicle; and

[1c] (c) applying, by the device discovery daemon, at least the following rules:

[1d] (C1) when the computational device is located within the predetermined area and/or zone of the vehicle, permitting the computational device to access or attempt to access the vehicle network and/or communication subsystem; and

[1e] (C2) when the computational device is not located within the predetermined area and/or zone of the vehicle, not permitting the computational device to access or attempt to access the vehicle network and/or communication subsystem.

(Ex. 1001, Claim 1.)

The technology of the challenged independent claims was well-known in the art by April 15, 2013. (Ex. 1003, ¶¶ 70, 86-121.)

The dependent claims add common features, e.g., the computational device determining its own location (claims 2, 9, 16), device discovery (claims 3, 10, 17), localization/device positioning strategies (claims 4, 6-7, 11, 13-14, 18, 20-21), and limiting access to a set of tasks/operations based on the location of the computational device (claims 5, 12, 19). (Ex. 1003, ¶ 71.)

C. Prosecution History

The '697 Patent issued from patent application serial no. 14/253,312. The patentee filed multiple information disclosure statements citing hundreds of references during prosecution. (Ex. 1002, 269-276, 615-619, 793, 818-819.) Nonetheless, the Examiner issued a first action notice of allowance of all claims

without rejection or objection. (Ex. 1002, 585-592.) The Examiner's reasons for allowance focused on the claim limitations directed to permitting, or not permitting (*i.e.*, limiting), access to the vehicle network based on the location of the computational device:

The prior art of record fails to teach - applying, by the device discovery daemon, at least the following rules: (C1) when the computational device is located within⁴ the predetermined area and/or zone of the vehicle, permitting the computational device to access or attempt to access the vehicle network and/or communication subsystem; and (C2) when the computational device is not located within the predetermined area and/or zone of the vehicle, not permitting the computational device to access or attempt to access the vehicle network and/or communication subsystem.

(Ex. 1002, 590; Ex. 1003, ¶¶ 73-76.)

The '697 Patent issued to Flextronics AP, LLC on April 28, 2015 (Ex. 1001, Cover), and lapsed on April 28, 2023 for failure to pay the 7.5-year maintenance fee. Patent Owner revived the '697 Patent on February 16, 2024. (Ex. 1002, 898-904; Ex. 1003, ¶ 76.)

V. Claim Construction — 37 C.F.R. §42.104(B)(3)

In an IPR proceeding, the claims are construed “in accordance with the

⁴ Emphasis added by Petitioner unless indicated otherwise.

ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” 37 C.F.R. §42.100(b); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc). Petitioner applies the plain and ordinary meaning of the Challenged Claims to the asserted prior art references in support of all grounds herein.

Petitioner proposes the following claim constructions for the purposes of this Petition only.

A. (Claims 1, 8, 15) “*daemon*” means “computer program”

Independent claims 1, 8, and 15 require that the “*device discovery daemon*”⁵ is executed by a microprocessor, which indicates that it is software or a computer program. For example, representative claim 1 requires “*determining, by a microprocessor executable device discovery daemon, that a computational device is connected to or attempting to connect to a network and/or communication subsystem of a vehicle; ...*.” A POSA would have understood that a microprocessor executes a computer program, i.e., software. (Ex. 1003, ¶¶ 80-81.) Claim 3 requires functionality performed by the device discovery daemon, e.g.:

receiving, by the device discovery daemon, information from an on board vehicle sensor that a new occupant has entered the vehicle;

⁵ Petitioner uses italics to indicate claim language.

in response to the receipt of the information, emitting, by the device discovery daemon, a ping to discover the computational device; and when a responsive signal is received from the computational device, determining, by the device discovery daemon, that the computational device is attempting to connect to a network and/or communication subsystem of a vehicle.

(Ex. 1001, Claim 3.)

The term “*daemon*” should not be interpreted to import discovery functionality as it would render the functional limitations of claim 3 meaningless. “[T]he presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim.” *Phillips* 415 F.3d at 1315 (Fed. Cir. 2005) (en banc) (citing *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 910 (Fed.Cir.2004)). Further, due to the dependence of claim 3 on claim 1 and use of “the device discovery daemon,” claim 3 is referring to the same “*microprocessor executable*” computer program of claim 1 by way of antecedent basis. “It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” *Phillips*, 415 F.3d at 1312 (Fed. Cir. 2005) (en banc) (citing *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996), (“we look to the words of the claims themselves...to define the scope of the patented invention”).

In addition to the claims, “the specification ‘is always highly relevant to the

claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” *Phillips*, 415 F.3d at 1315 *quoting Vitronics*, 90 F.3d at 1582. The specification confirms that the device discovery daemon is a computer program, or software. The ’697 Patent discloses that the “device discovery daemon 1020 may be a computer program that runs as a background process that can discover new devices that connect with the network...or devices that disconnect from the network.” (Ex. 1001, 57:45-48.) Accordingly, Petitioner construes “*daemon*” as a “computer program” based on the claim language, as confirmed by the specification.

B. (Claims 1, 8, 15) “*access or attempt to access the vehicle network and/or communication subsystem*” means “*access or attempt to access [functionality of] the vehicle network and/or communication subsystem*”

Independent claims 1, 8, and 15 also require “(C1) *when the computational device is located within the predetermined area and/or zone of the vehicle, permitting the computational device to access or attempt to access the vehicle network and/or communication subsystem.*” Each independent claim includes three steps: (a), (b), and (c). Step (c) includes sub-steps (C1) and (C2). The “*permitting*” sub-step C1 follows the “*determin[ation]*” in step (a) “*that a computational device is connected to or attempting to connect to a network and/or communication subsystem of a vehicle.*” Since step (a) provides for determining that the

computational device is “*connected to...a network and/or communication subsystem*” the term “*access*” in step (C1) must indicate more than mere connection to the network and/or communication subsystem, e.g., access to functions available through the vehicle network and/or communication system. (Ex. 1003, ¶ 83.)

The '697 Patent specification confirms that the claim term “*access*” in substeps (C1) and (C2) is used to describe accessing functionality of a vehicle system. The '697 Patent describes “an operation of the device discovery daemon 1020” with reference to Figure 20. (Ex. 1001, 91:60-61.) As illustrated in step 2020 of Figure 20 below, the device discovery daemon “ENABLE[s] ACCESS TO [a] DEFINED SET OF FUNCTIONS BASED ON [the] LOCATION OF [the] DEVICE.”

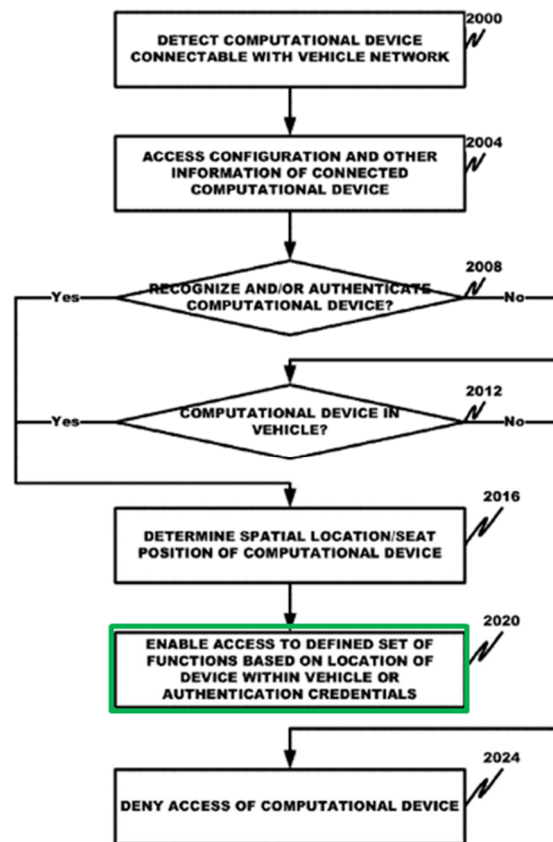


Fig. 20

Ex. 1001, Fig. 20 (Annotated)

The '697 Patent specification clarifies that enabling access in claim 1 means permitting the computational device to connect with the vehicle network 356 or communication subsystem 1008 to perform a task, function and/or operation based on the location of the computational device. (Ex. 1001, 96:26-34.) Dependent claims 5, 12, and 19 further recite that the discovery daemon determines a “*set of tasks, functions, and/or operations*,” whereas the independent claims recite access to vehicle function more broadly.

The '697 Patent specification describes PEPS functionality with reference to Figure 5A using the term “access” and explains that “the location of the device 212, 248 relative to the vehicle 104 may determine vehicle functionality and/or features to be provided and/or restricted to a user 216.” (Ex. 1001, 34:3-5.) For example, “a device 212, 248 associated with a user 216 may be located at a second outside area 520” that is far away from the vehicle 104 and therefore “the vehicle 104 may lock one or more features (e.g., ignition access, vehicle access, communications ability, etc.) associated with the vehicle 104.” (Ex. 1001, 34:5-13.) By “lock[ing]” “vehicle access” and “ignition access”, the '697 Patent is describing the control of PEPS functionality based on the location of the device 212, 248 relative to the vehicle 104. (Ex. 1003, ¶¶ 84-85.)

The '697 Patent also describes, with reference to Figure 5B, connected devices “accessing” vehicle system functionality. For example, “[o]nly devices in [the front seat] area 1 508A may be able to access vehicle control functions such as when ‘parents’ are located in area 1 508A and the children are located in area 2 508B.” (Ex. 1001, 35:25-28.) However, devices located in the rear passenger compartment, e.g., “area 2 508B devices can be provided with full access to multimedia and infotainment available within the vehicle 104” but “may be restricted from any access to vehicle functions.” (Ex. 1001, 35:22-25.) “[T]he specification ‘is always highly relevant to the claim construction analysis. Usually,

it is dispositive; it is the single best guide to the meaning of a disputed term.”
Phillips, 415 F.3d at 1315 (quoting *Vitronics*, 90 F.3d at 1582 (Fed. Cir. 1996)).

For these reasons, Petitioner construes the term “*access or attempt to access the vehicle network and/or communication subsystem*” as “*access or attempt to access [functionality of] the vehicle network and/or communication subsystem*” and not merely “*accessing*” or connecting to a network or subsystem, as the computational device is already connected as recited in claim limitation (a).

VI. Prior Art Overview

A. U.S. 8,768,539 B1 (“Clement” Ex. 1010)

Clement discloses a vehicle permission management system “that is configured to receive user input for controlling [a] vehicle ...[by] a portable communication device” such as “a tablet, a smart phone, a laptop, or another type of portable computing device.” (Ex. 1010, 4:42-45, 6:9-10.) Clement further discloses that the vehicle includes a “vehicle control unit 320 [that] determines the current location of the control device 230” and based on the determined location, the “vehicle control unit 320 determines whether [an] instruction is permitted to be invoked.” (Ex. 1010, 10:37-38, 10:55-57, 10:62-67, Fig. 8; Ex. 1003, ¶¶ 125-135.)

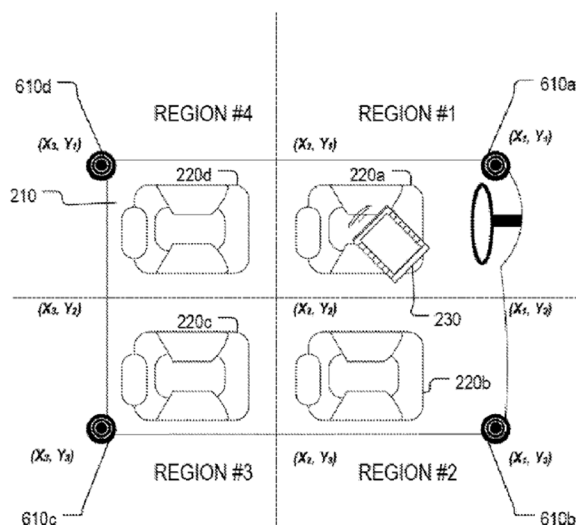


Fig. 6

Ex. 1010, Fig. 6

B. U.S 7,388,466 B2 (“Ghabra” Ex. 1011)

Ghabra discloses a PEPS system that allows a vehicle to communicate wirelessly with a key fob for hands-free access and ignition. (Ex. 1011, 2:13-16, 2:63-65.) The system starts when a user pulls a door handle, “generat[ing] a trigger pulse provided to microcontroller 13 resulting in executing a trigger generation function.” (Ex. 1011, 3:48-51.) Ghabra also discloses that the trigger event could occur when a user “press[es] a start button inside the vehicle.” (Ex. 1011, 5:22-25.)

Ghabra explains that the trigger event causes the vehicle to “generate an LF wakeup signal to activate [an] LF receiver 37 in fob 12.” (Ex. 1011, 3:51-54.) Subsequently, Ghabra discloses that the system will “broadcast a UHF challenge signal including [a] random number” to begin an authentication process between the

vehicle and the fob. If the fob responds to the challenge signal with a proper identification number match, “the microcontroller 13...determines the...response signal to be valid,” thereby authenticating the fob and allowing a connection between the fob and the vehicle system to be made. The system also checks the fob’s location—requiring it to be outside the vehicle for entry, and inside for starting the engine. (Ex. 1011, 4:8-29, Figs. 2-3; Ex. 1003, ¶¶ 136-141.)

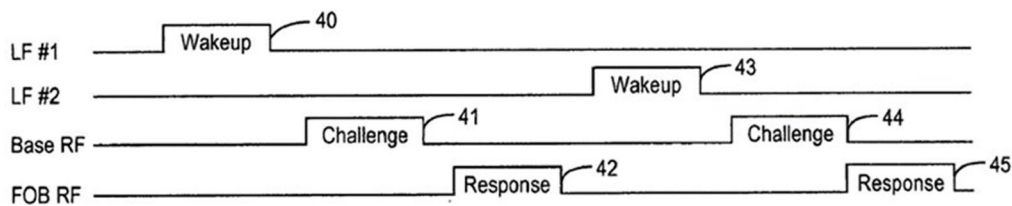


FIG. 2

Ex. 1011, Fig. 2

C. U.S. Pub. No. 2012/0092129 A1 (“Lickfelt” Ex. 1012)

Lickfelt discloses a passive entry system for vehicles, using both proximity detection and signal strength measurements over time. (Ex. 1012, [0001]-[0006].) The system includes a portable key fob and a vehicle control unit that is able to determine the location of the fob. (Ex. 1012, [0010]-[0012].) Lickfelt further discloses that to determine proximity more precisely, the system defines “a plurality of zones with respect to vehicle 12...includ[ing] an internal zone 30, a proximal zone 32, a hysteresis zone 34, and an outer zone 36.” (Ex. 1012, [0016].)

Lickfelt explains that “[o]nly fobs associated with the vehicle 12 can unlock

the door lock 24 (and perform other vehicle operations).” Lickfelt discloses that if the system determines that the fob is authentic, “is getting closer to the vehicle...[and is] located within the proximal zone 34 [*sic* 32]” the fob will be permitted to access certain vehicle functions, such as unlocking or locking the vehicle doors. (Ex. 1012, [0018], [0024]-[0031]; Ex. 1003, ¶¶ 142-151.)

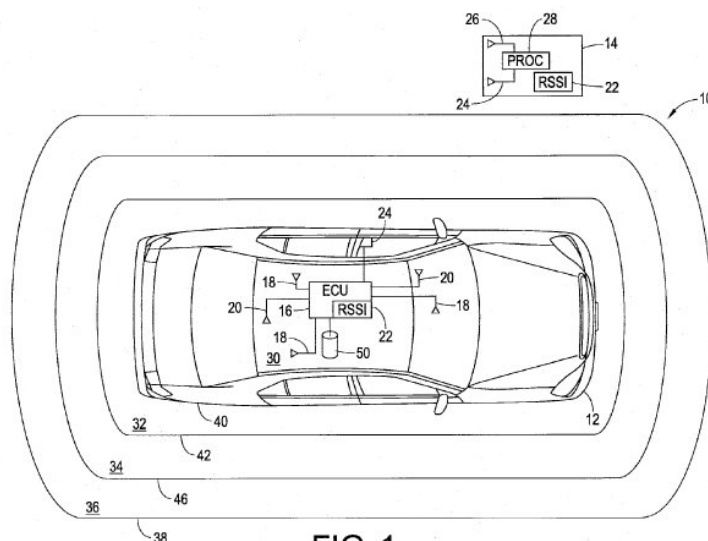


FIG. 1

Ex. 1012, Fig. 1

VII. Unpatentability Grounds

The references below render the claimed subject matter invalid under 35 U.S.C. §103 and the Petitioner therefore has a reasonable likelihood of prevailing as to each of the following grounds of unpatentability. 35 U.S.C. §314(a); 37 C.F.R. §42.104(b)(4).

A. Ground 1: Claims 1-2, 4-9, 11-16, 18-21 are Unpatentable as Obvious Over Clement

1. Independent Claims 1, 8, 15⁶

1[pre]. A method, comprising:

8[pre]. A vehicle, comprising:

15[pre]. A tangible and non-transient computer readable medium...

Clement discloses a vehicle 101, a vehicle control unit 320, and a “process associated with controlling of the vehicle of FIG. 1 by the vehicle control unit of FIG. 4.” (Ex. 1010, 4:10-17, 4:27-29, Fig. 8; Ex. 1003, ¶¶ 153-156, 240-242.)

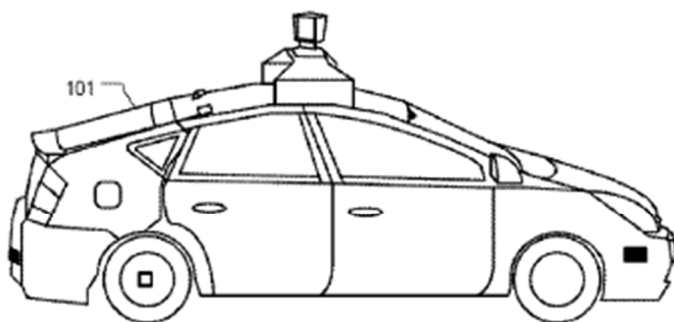


Fig. 1

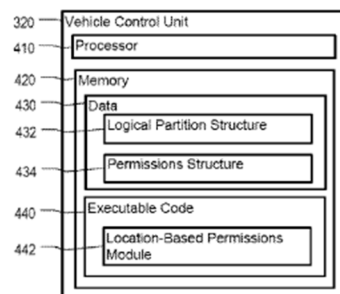


Fig. 4

Ex .1010, Figs. 1, 4

The process includes multiple tasks, including entering user input into the control device 230 “at task 840...[that] may specify an instruction to change a state of a vehicle system.” (Ex. 1010, 10:27-33.) Clement also describes the process of

⁶ Appendix A includes a listing of all challenged claims and Appendix B includes a table comparing claims that are treated together.

Figure 8 as a method, e.g., “A method comprising: receiving by one or more processors, over a wireless link, an instruction to change a state of a vehicle system” (Ex. 1010, 13:31-33; Ex. 1003, ¶¶ 154-156.)

Clement discloses that the vehicle control unit 320 includes a processor 410 and memory 420 and that “[t]he memory may be of any type of tangible media capable of storing information accessible by the processor, such as a hard-drive, memory card, ROM, RAM, DVD, CD-ROM, write-capable, and read-only memories.” (Ex. 1010, 7:51-62.) A POSA would have understood that a “non-transitory medium is a physical object where data can be stored, like a hard drive, Random Access Memory (RAM), Read-Only Memory (ROM), CD-ROM storage, or memory card.” (Ex. 1003, ¶¶ 268-269; Ex. 1050, 94-95; Ex. 1051, 152.)

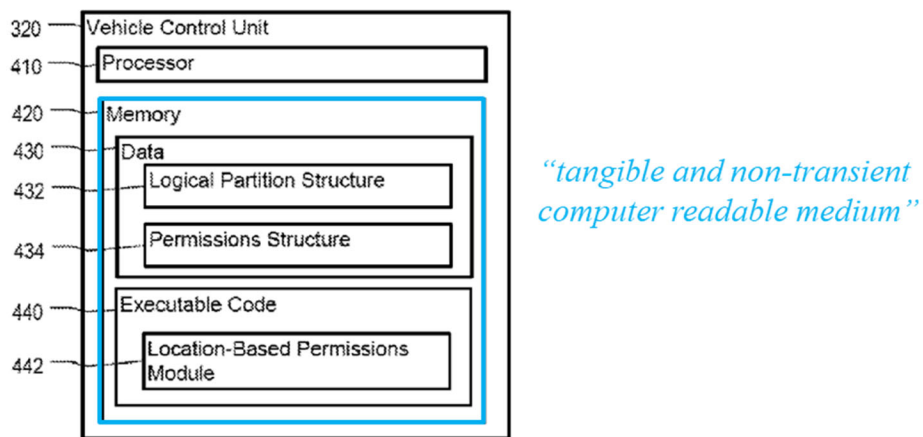


Fig. 4

Ex. 1010, Fig. 4 (Annotated)

[1a]/[8a]...a microprocessor executable device discovery daemon,

As explained above, Petitioner construes the term “*daemon*” as “computer program.” Clement discloses that the vehicle control unit 320 and the portable device location system 330 “may be (completely or partially) integrated together.” (Ex. 1010, 6:27-30, 7:32-36.) Clement further discloses that “the vehicle control unit 320 may include a processor 410 and memory 420” that “may store information accessible by processor 410, including executable code 440 that may be executed by the processor 410.” (Ex. 1010, 7:51-57; Ex. 1003, ¶¶ 157-162, 243-244.)

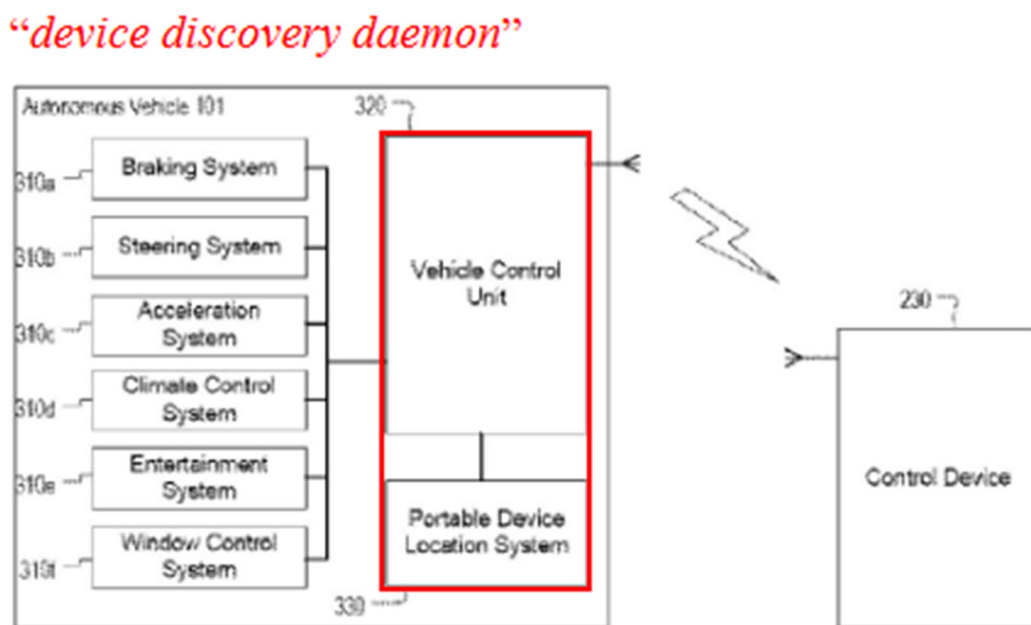


Fig. 3

Ex. 1010, Fig. 3 (Annotated)

Clement discloses that “[t]he processor 410 may be any well-known processor, such as commercially available processors. Alternatively, the processor

may be a dedicated controller such as an ASIC.” (Ex. 1010, 7:62-65.) Clement’s dedicated controller such as an ASIC teaches a microprocessor. (Ex. 1003, ¶¶ 165-166; Ex. 1051, 872, 693; Ex. 1050, 94.)

Clement further discloses that “the executable code 440 may include a location-based permissions module 442 that is configured to enforce location-based restriction policies.” (Ex. 1010, 8:13-17, Fig. 4.) The executable code 440, that is executed by the processor 410 and includes the location-based permissions module 442 of the vehicle control unit 320 combined with the portable device location system 330, teaches the “*microprocessor executable device discovery* [computer program]” limitation. (Ex. 1003, ¶¶ 163-164.)

[1a] (a) determining, by a microprocessor executable device discovery daemon, ...

[8a] a microprocessor executable device discovery daemon operable to: [8b] (a) determine ...

15[pre]. A tangible and non-transient computer readable medium including microprocessor executable instructions that, when executed, perform at least the following functions: [15a] (a) determining ...

... that a computational device is connected to or attempting to connect to a network and/or communication subsystem of a vehicle;

Clement discloses a control device 230 (“*computational device*”) that is “used

by the vehicle's driver and/or passengers to control the vehicle.” (Ex. 1010, 5:49-51, Fig. 2.) Clement further discloses that the “control device 230 may be a tablet, a smart phone, a laptop, or another type of portable computing device.” (Ex. 1010, 6:9-10; Ex. 1003, ¶167.)

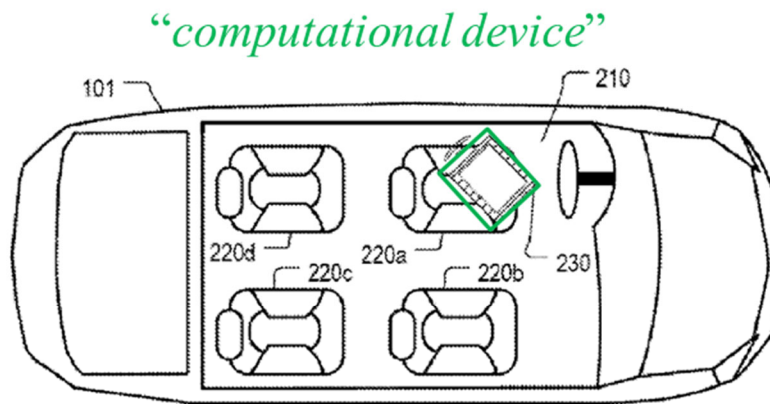


Fig. 2

Ex. 1010, Fig. 2 (Annotated)

The vehicle control unit 320 controls the vehicle using the process illustrated in Figure 8. (Ex. 1010, 4:27-29.) With reference to task 820, Clement discloses that the vehicle control unit 320 establishes “a connection between the control device 230 and the vehicle control unit 320” utilizing “any communications protocol” such as “Bluetooth.” (Ex. 1010, 9:45-50, Fig. 8; Ex. 1003, ¶ 168.)

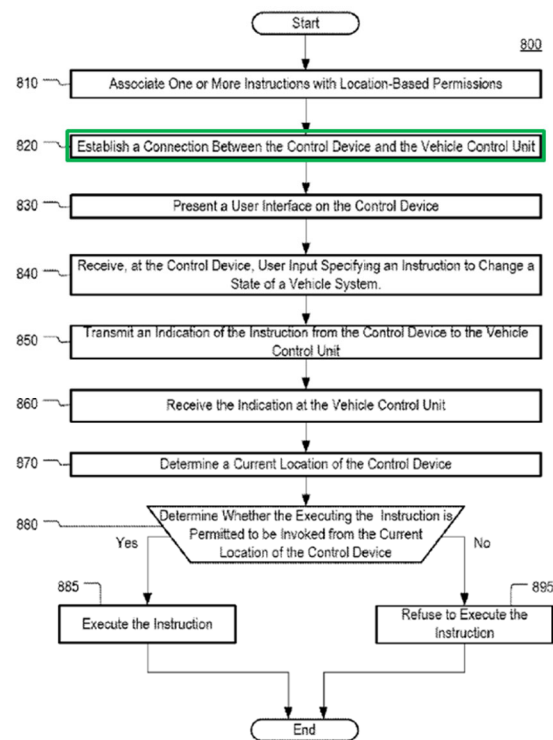


Fig. 8

Ex. 1010, Fig. 8 (Annotated)

A POSA would have understood that Bluetooth was a common protocol used by vehicle systems, for transmitting wireless signals (RF signals) to/from wireless devices; and Bluetooth includes aspects of device discovery in which a computer program runs in the background to discover wireless devices. (Ex. 1003, ¶¶ 97-101; Ex. 1052, Vol. 2, 150-151, 160-163; Ex. 1065, 2, 206; Ex. 1063, 7.) Accordingly, a POSA would have understood that the vehicle control unit 320 operates in the background to detect the presence of the control device 230, and upon such detection, “*determin[es]*” that the control device 230 is “*attempting to connect to a network and/or communication subsystem of a vehicle.*” A POSA would have

understood that by establishing a connection with, and receiving instructions from, the control device 230, the vehicle control unit 320 connects to the control device 230 over a wireless connection. (Ex. 1003, ¶¶ 169-170.)

Clement further discloses that the “[v]ehicle control unit 320 may also be operatively connected to one or more of the vehicle systems 310a-f and it may be operable to change the state of any one of these systems.” (Ex. 1010, 6:63-66.) A POSA would have understood that the vehicle control unit 320 and the vehicle systems 310 would have been connected to each other over a wired connection to facilitate the vehicle control unit 320 controlling, or changing the state of, the vehicle systems 310a-f. As illustrated in the image below, the wireless and wired connections collectively provide a “*network*” to enable the control device 230 to control vehicle system functionality through the vehicle control unit 320. (Ex. 1003, ¶ 171.)

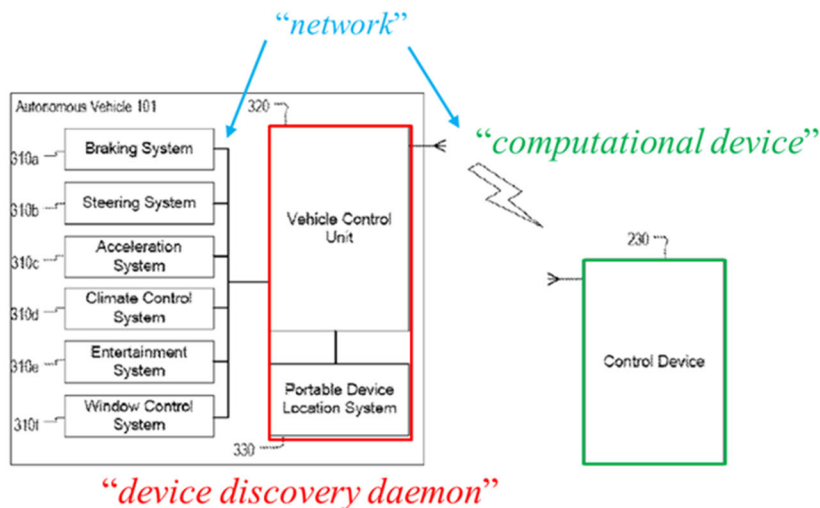


Fig. 3

Ex. 1010, Fig. 3 (Annotated)

Accordingly, Clement teaches “*determining, by a microprocessor executable device discovery [computer program] [vehicle control unit 320 with portable device location system 330 executable code 440], that a computational device [control device 230] is connected to or attempting to connect to a network and/or communication subsystem of a vehicle [e.g., by first detecting the control device 230 using its background program, and then establishing a connection between the control device 230 and the vehicle network through the vehicle control unit 320].*” (Ex. 1003, ¶¶ 157-172, 243-244, 270-271.)

[1b]/[8c]/[15b] (b) in response, determining, [by the device discovery daemon,] whether the computational device is located within a predetermined area and/or zone of the vehicle; and

Clement discloses that after establishing a connection at task 820 (annotated in green below), “the vehicle control unit 320 determines the current location of the control device 230” “[a]t task 870” (annotated in red below). (Ex. 1010, 10:37-45; Ex. 1003, ¶ 173.)

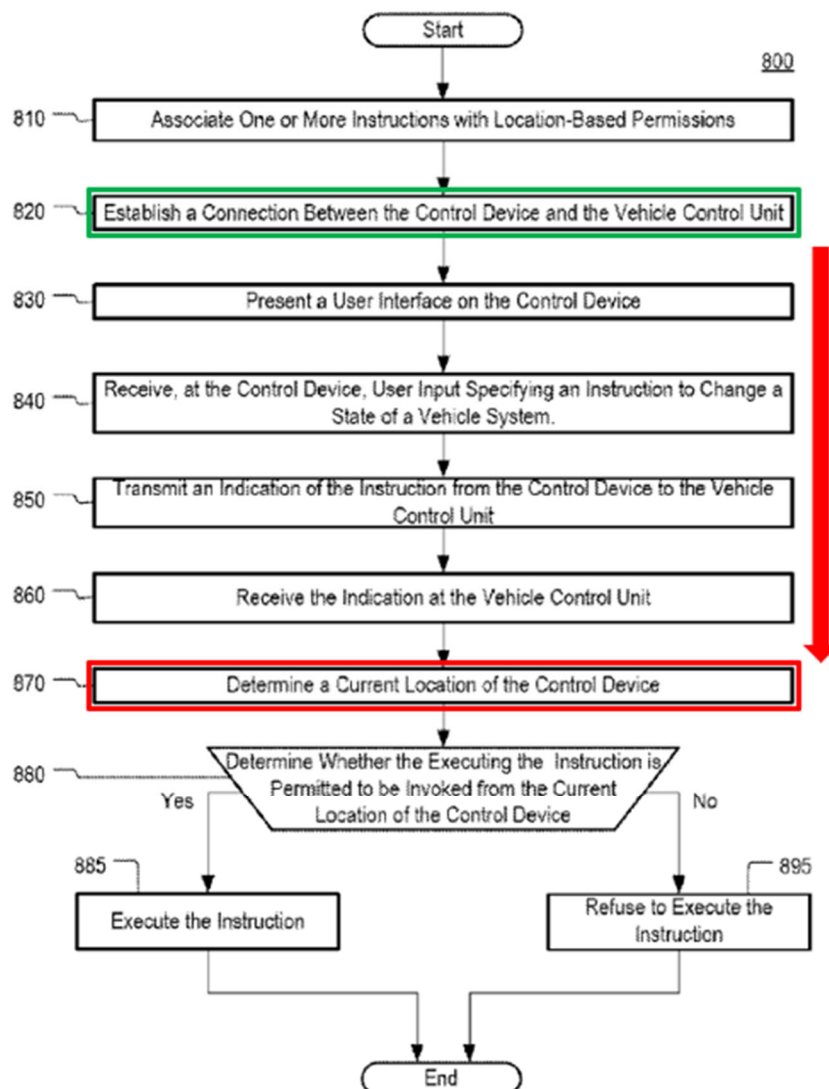


Fig. 8

Ex. 1010, Fig. 8 (Annotated)

Clement further discloses that the location of the control device 230 refers to the specific (“*predetermined*”) region (e.g., Regions 1-4) of the vehicle that the control device 230 is located in, e.g., “the module 432 may determine the current location of the control device 230 in the passenger compartment 210 and execute the instruction only if the control device 230 is located in a **region** of the passenger compartment 210 where the instruction is permitted to be invoked from.” (Ex. 1010, 8:14-24; Ex. 1003, ¶¶ 174-176, 245, 272.)

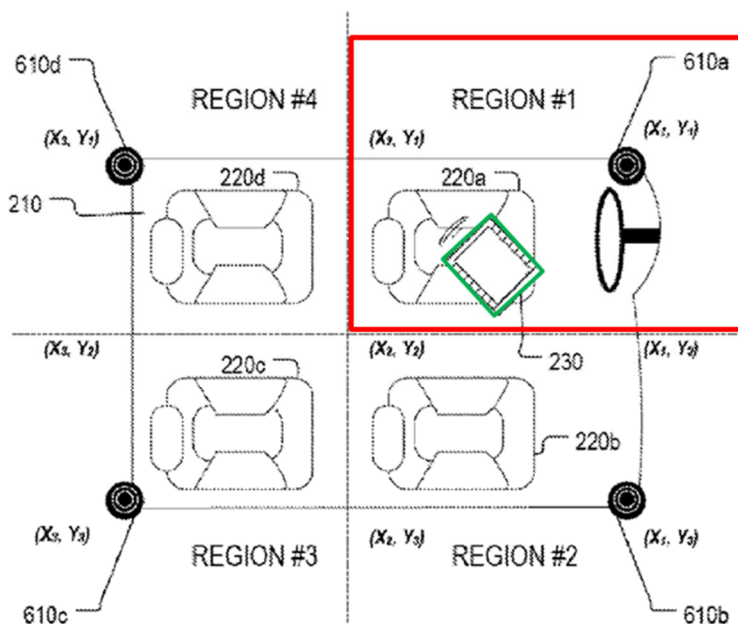


Fig. 6

Ex. 1010, Fig. 6 (Annotated)

[1c]/[8d]/[15c] applying, [by the device discovery daemon,] at least the following rules:

[1d]/[8e]/[15d] (C1) when the computational device is located within the predetermined area and/or zone of the vehicle, permitting the computational device to access or attempt to access the vehicle network and/or communication subsystem; and

As explained above, Petitioner construes the term “*access or attempt to access the vehicle network and/or communication subsystem*” as “*access or attempt to access [functionality of] the vehicle network and/or communication subsystem.*” Clement discloses controlling access to vehicle functionality based on the location of the computational device as claimed. (Ex. 1003, ¶¶ 177-180, 246, 273.)

Clement discloses that the “vehicle control unit 320 may use the location system 330 to enforce location-based permissions on instructions received from the control device 230.” (Ex. 1010, 7:40-50.) With reference to Figure 8 below, Clement discloses that “[a]t task 880, the vehicle control unit 320 determines whether the instruction is permitted to be invoked from the current location of the control device 230” and if so “task 885 is executed” *i.e.*, the vehicle control unit 320 “Execute[s] the Instruction.” (Ex. 1010, 10:55-67; Ex. 1003, ¶¶ 181-182.)

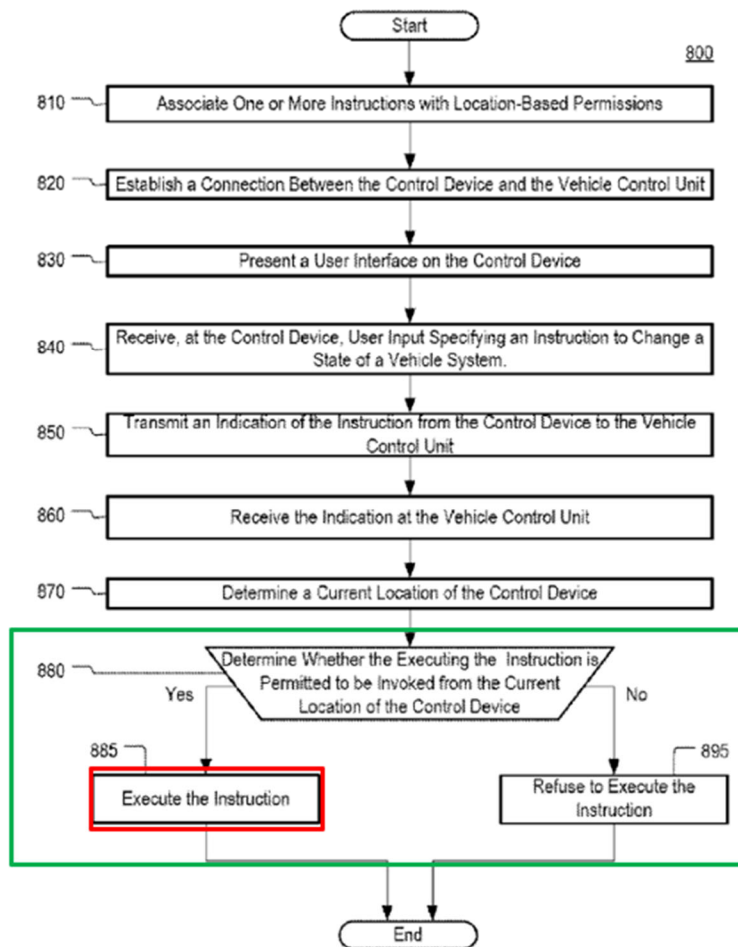


Fig. 8

Ex. 1010, Fig. 8 (Annotated)

Clement discloses an example of such an executed task, e.g., “some instructions, such as steering the vehicle 101, may be invoked only when the control device 230 is located in the area of the driver seat 220a.” (Ex. 1010, 7:42-45.) A POSA would have understood that the control device 230 accesses the vehicle network, through the vehicle control unit 320, to control the steering system 310b. (Ex. 1003, ¶183.)

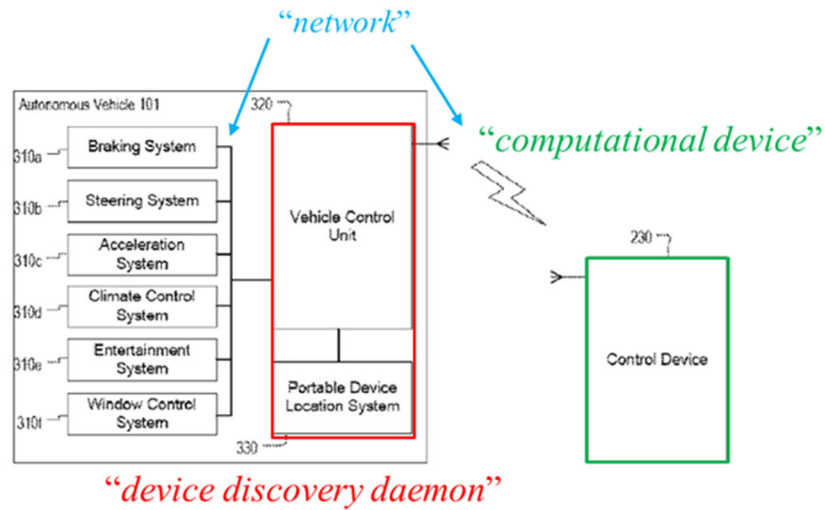


Fig. 3

Ex. 1010, Fig. 3 (Annotated)

Clement also discloses that the user interface of the control device 230 displays “buttons” 910a-i (misabeled as 900a-i in the figures) that allow the user to control different aspects or features, e.g., “clicking on the button 910a may lead users to a menu that enables the steering, stopping, or acceleration of the vehicle 101.” (Ex. 1010, 9:55-60; Ex. 1003, ¶ 184.)

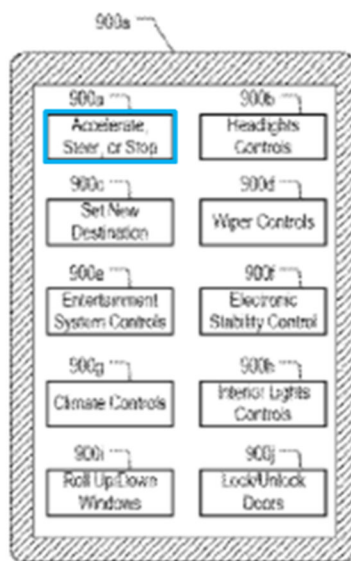


Fig. 9A

Ex. 1010, Fig. 9A (Annotated)

Clement also discloses varying the menu of available input components displayed on the user interface of control device 230 based on its location, e.g., “only if the control device 230 is located in region #1, the menu 900A may be displayed” which “may include input components...for safety-critical aspects of the operation of the vehicle 101, such as accelerating, steering, and braking.” (Ex. 1010, 10:14-26; Ex. 1003, ¶¶ 185-186, 247, 274.)

[1e]/[8f]/[15e] (C2) when the computational device is not located within the predetermined area and/or zone of the vehicle, not permitting the computational device to access or attempt to access the vehicle network and/or communication subsystem.

Again, Petitioner construes the term “access or attempt to access the vehicle

network and/or communication subsystem” as “access or attempt to access [functionality of] the vehicle network and/or communication subsystem.” Clement discloses controlling access to vehicle functionality based on the location of the computational device, e.g., “[a]t task 880” “if the control device 230 is outside of any regions where the instruction is permitted to be invoked from, task 895 is performed.” (Ex. 1010, 10:55-67.) As illustrated in Figure 8 below, the vehicle control unit 320 “Refuses to Execute the Instruction” at task 895. (Ex. 1003, ¶¶ 187-189, 248, 275.)

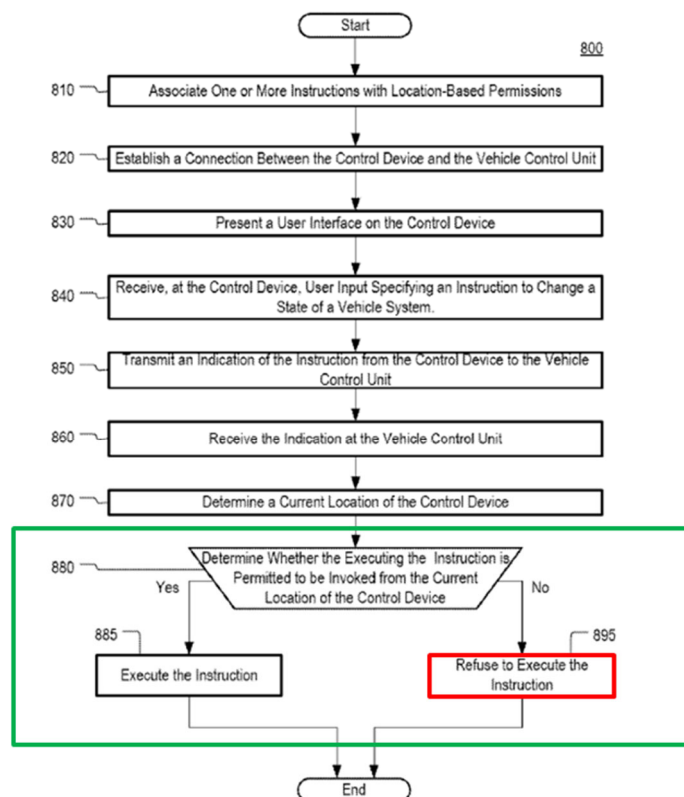


Fig. 8

Ex. 1010, Fig. 8 (Annotated)

Clement discloses that “some instructions, such as steering the vehicle 101, may be invoked only when the control device 230 is located in the area of the driver seat 220a.” (Ex. 1010, 7:42-45.) As illustrated below, the steering button 900a (annotated in blue) is displayed on the user interface 900a when the user is located in the driver seat (Fig. 9A), but the steering button 900a is not displayed on the user interface 900b when the user is located in a passenger seat (Fig. 9B). (Ex. 1003, ¶¶ 190-191.)

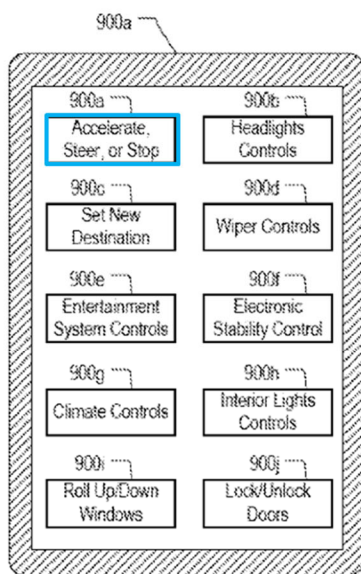


Fig. 9A

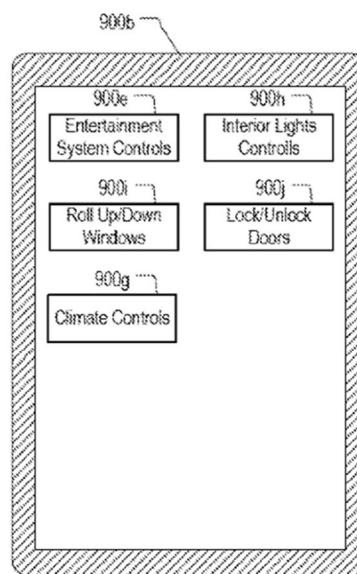


Fig. 9B

Ex. 1010, Fig. 9A (Annotated), Fig. 9B

2. Dependent Claims 2, 4-7, 9, 11-14, 16, and 18-21

[2a] The method of claim 1, ...

[9a] The vehicle of claim 8, ...

[16a] The computer readable medium of claim 15, ...

... wherein a type of the computational device determines a specific predetermined area and/or zone of the vehicle, from among a plurality of predetermined areas and/or zones, to be used in applying the rules,

Clement discloses that “the control device 230 may determine its location and communicate it to the vehicle control unit 320.” (Ex. 1010, 10:48-49, *see also* 12:14-25.) Clement further discloses that “transmitters may be positioned at various locations in the vehicle 101 and the control device 230 may triangulate signal strength measurements from those transmitters to independently determine its location within the passenger compartment 210.” (Ex. 1010, 10:50-54.) A POSA would have understood that this modification of shifting processing from the vehicle control unit 320 to the control device 230 is just a simple substitution of one known element for another to obtain predictable results, e.g., reducing power consumption by the vehicle system. (Ex. 1003, ¶¶ 192-195.)

Clement also discloses, with reference to Figure 6 below, determining if the specific location of the control device 230 is within one of the four specific “regions in the passenger compartment 210 where the instruction is permitted to be invoked from.” (Ex. 1010, 10:55-67, *see also* 1:42-51; Ex. 1003, ¶¶ 196-197, 252, 279.)

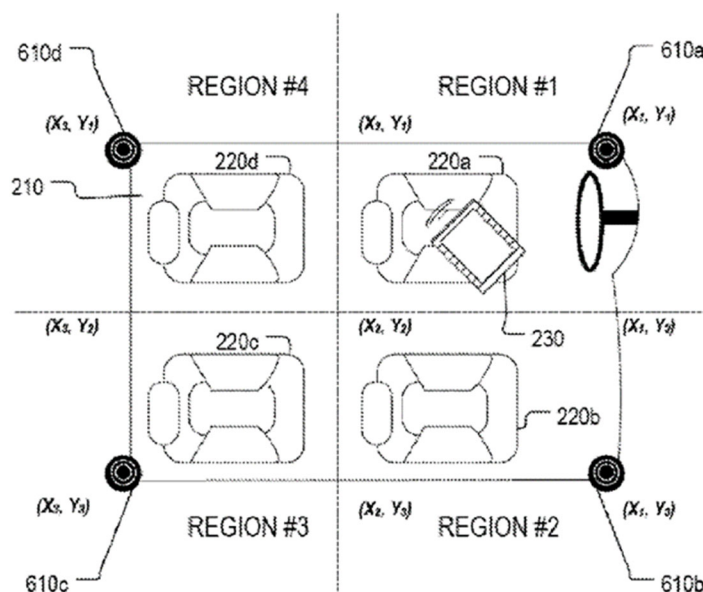


Fig. 6

Ex. 1010, Fig. 6

[2b]/[9b]/[16b] wherein the computational device is one or more of a tablet, computer, laptop, smart phone, and personal digital assistant, and

Clement discloses that the control device 230 (“computational device”) “may be a tablet, a smart phone, a laptop, or another type of portable computing device.” (Ex. 1010, 6:9-10; Ex. 1003, ¶¶ 198-199, 253, 280.)

[2c]/[9c]/[16c] wherein the specific predetermined area and/or zone of the vehicle is at least part of the passenger compartment.

Clement discloses that “the control device 230 may triangulate signal strength measurements from those transmitters to independently determine its location within the passenger compartment 210.” (Ex. 1010, 10:50-54; Ex. 1003, ¶¶ 200-204, 254,

281.)

[4] The method of claim 1, wherein the determining step⁷...

[11] The vehicle of claim 8, wherein the determining operation...

[18] The computer readable medium of claim 15, wherein the determining function...

Clement describes the method illustrated in Figure 8 as including a series of “tasks.” (Ex. 1010, 10:37-38.) A POSA would have understood that Clement’s disclosure of method tasks teaches method steps, operations, and functions because these are all synonymous terms used in describing method steps. (Ex. 1003, ¶¶ 205-206, 255-257, 282-283.)

... (b) bases the determination on whether the computational device is located within the predetermined area and/or zone of the vehicle on one or more of signal strength of a signal from the computational device as received by an access point of the vehicle, a received satellite-based position of the computational device, triangulation based on relative received signal strengths of a signal from the computational device as received by multiple access points

⁷ The ’697 Patent uses the terms “step,” “operation,” and “function” interchangeably, for example: “The present disclosure can include a method, vehicle, and/or tangible and non-transient computer readable medium comprising the steps, operations, and/or functions of:” (Ex. 1001, 4:47-53.)

of the vehicle....

Clement discloses that the vehicle control unit 320 and the location system 330 “may be (completely or partially) integrated together.” (Ex. 1010, 7:32-36.) Clement further discloses that the “location system 330 may include hardware and/or software for determining the location of the control device 230 within the passenger compartment 210.” (Ex. 1010, 7:23-32.) With reference to Figure 6, the “location system 330 includes receivers 610a-d...located in different parts of the of the passenger compartment 210” that “may take measurements of the strength of radio signal(s) transmitted by the control device 230 and forward those measurements to the vehicle control unit 320 where they are triangulated and used to determine the location of the control device 230.” (Ex. 1010, 7:23-32; Ex. 1003, ¶¶ 207-210.)

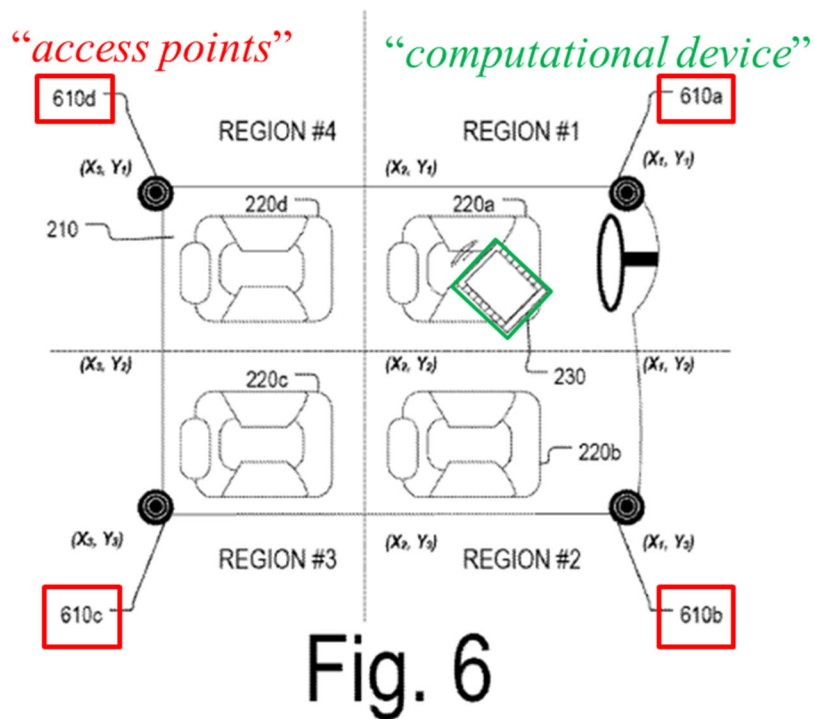


Fig. 6

Ex. 1010, Fig. 6 (Annotated)

Accordingly, Clement discloses that the vehicle control unit 320 and location system 330 software (“*device discovery daemon*”) determines the location of the control device 230 (“*computational device*”) using triangulation based on the strength of radio signals received at multiple vehicle receivers 610 (“*access points*”). (Ex. 1010, 8:43-46; Ex. 1003, ¶ 211.)

[5a] The method of claim 4,...

[12a] The vehicle of claim 11,...

[19a] The computer readable medium of claim 18,...

... ***wherein the⁸ wherein the computational device determined to be located within the predetermined area and/or zone of the vehicle and is permitted to access or attempt to access the vehicle network and/or communication subsystem and***

Claim [5a] is largely duplicative of claim [1d] and Claims [12a]/[19a] are largely duplicative of claim [5a]. Clement teaches Claims [5a]/[12a]/[19a]. (Ex. 1003, ¶¶ 212-215, 258-260, 284-286.)

[5b]/[12b]/[19b] wherein the device discovery daemon determines a set of tasks, functions, and/or operations that can be performed and a set of tasks, functions, and/or operations that cannot be performed based on the determined location of the computational device.

Clement discloses that the “vehicle control unit 320 may use the location system 330 to enforce location-based permissions on instructions received from the control device 230.” (Ex. 1010, 7:40-42.) Clement also discloses that if the control device 230 is held by the driver in the driver’s seat, the control device 230 “may be capable of steering or accelerating the vehicle 101” which is “*a set of tasks . . . that can be performed.*” (Ex. 1010, 5:61-64.) However, if the control device 230 is held by a passenger occupying a different seat in the vehicle, the control device 230 “may

⁸ Claims 5,12,19 each include two “*wherein the*” phrases which Petitioner interprets as a typographical error and not limiting.

be permitted to control the vehicle's entertainment system, but not steer or apply the brakes of the vehicle" which is *"a set of tasks...that cannot be performed."* (Ex. 1010, 5:64-67; Ex. 1003, ¶¶ 216-217.)

Clement also discloses varying the menu of buttons corresponding to available input components (*"a set of tasks...that can be performed"*) displayed on the user interface of control device 230 based on its location. For example, Figure 9B below shows that "when the control device 230 is located in regions #2-3, the menu 900B may be displayed," however, "the interface 900B [lacks] input components for controlling safety-critical aspects of the operation of the vehicle 101." (Ex. 1010, 10:18-26; Ex. 1003, ¶¶ 218-219, 258-260, 284-286.)

"operations that can be performed"

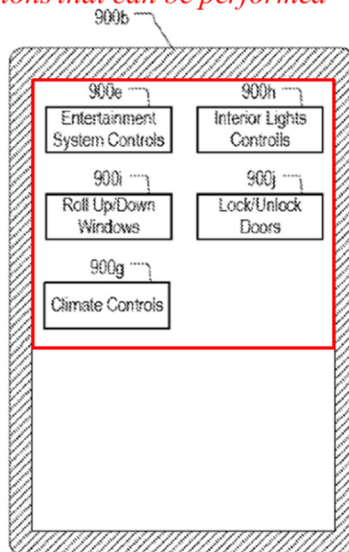


Fig. 9B

Ex. 1010, Fig. 9B (Annotated)

[6] The method of claim 4,...

[13] The vehicle of claim 11,...

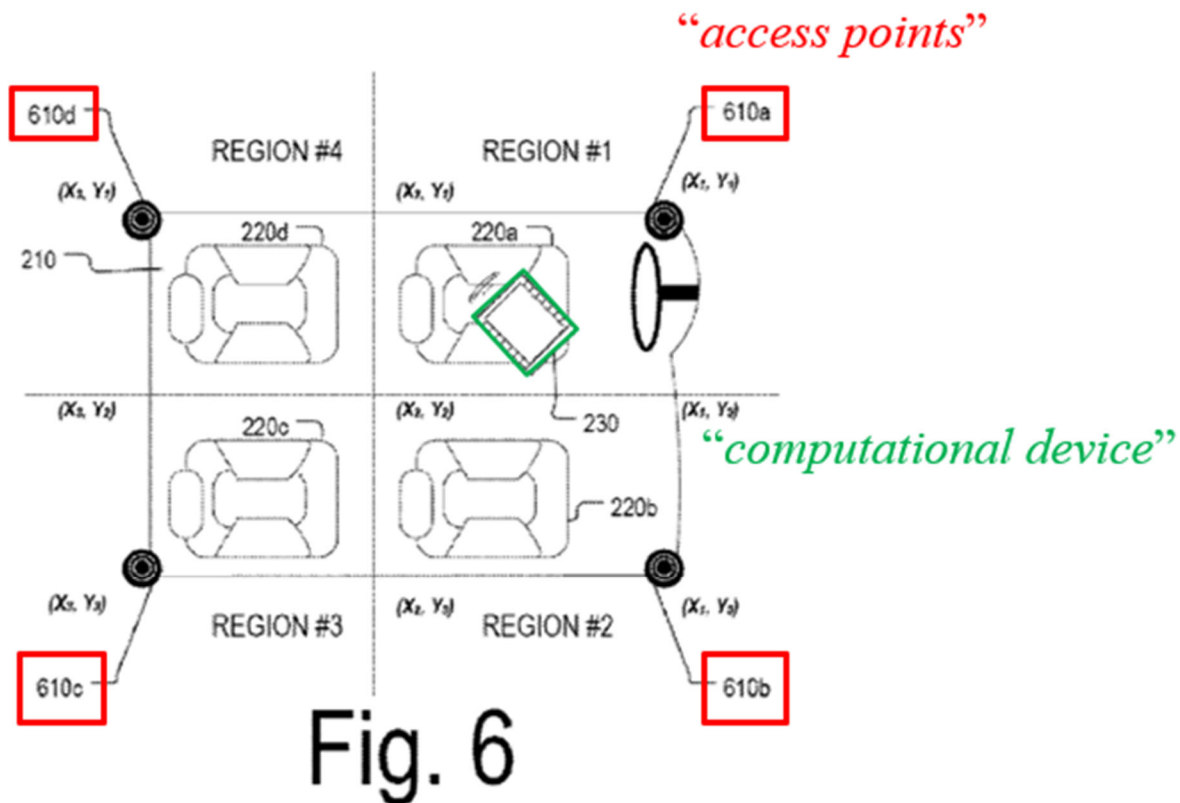
[20] The computer readable medium of claim 18,...

... wherein the device discovery daemon uses multiple of the one or more of signal strength of a signal from the computational device as received by an access point of the vehicle, a received satellite-based position of the computational device, triangulation based on relative received signal strengths of a signal from the computational device as received by multiple access points of the vehicle...

As explained above with reference to claim 4, Clement discloses determining the location of the control device (“*computational device*”) based on triangulation. (Ex. 1003, ¶¶ 205-211, 223.) Clement also discloses determining the location of the control device 230 (“*computational device*”) based on radio signal strength. (Ex. 1010, 3:13-15, 8:42-43; Ex. 1003, ¶¶ 220-231.)

Clement discloses using a simple coordinate-based model to define a region (i.e., Regions 1-4), where “each region may be presented as a single coordinate and a radius.” (Ex. 1010, 8:47-50.) A POSA would have understood that Clement’s disclosure that each region may be represented as a “single coordinate and radius” to indicate a range of signal strength values, and thus teaches a single access point. (Ex. 1003, ¶¶ 224-226.)

Clement further discloses defining each region using “4-tuples of signal strength ranges (e.g., sets of signal strength ranges that are expected to be measured by each of the receivers 610a-d when the control device 230 is in a given region).” (Ex. 1010, 8:50-58.) A POSA would have also understood that each of Clement’s radio receivers 610a-d is an “*access point*” as each receiver 610a-d receives signals from the device for localization purposes. (Ex. 1003, ¶¶ 227-231, 261-263, 287-289.)



Ex. 1010, Fig. 6 (Annotated)

[7] The method of claim 6,...

[14] The vehicle of claim 13,...

[21] The computer readable medium of claim 20,...

... wherein the device discovery daemon determines a level of confidence that the computational device is located within the predetermined area and/or zone and wherein the device discovery daemon determines that the computational device is located within the predetermined area and/or zone when the level of confidence has at least a threshold value.

The '697 Patent does not quantify the level of confidence nor define a threshold value to compare it to. Instead the '697 Patent merely states that “[t]his level of confidence can be based on consideration and analysis of multiple of the factors” and “[w]hen multiple factors indicate that the user is within the passenger compartment, a higher likelihood is assigned to that determination; likewise, when multiple factors indicate that the user is outside of the passenger compartment, a lower likelihood is assigned to the determination.” (Ex. 1001, 93:59-65.) Accordingly, these terms should not be interpreted to require specific values.

Clement discloses that “[t]he receivers 610a-b [*sic* 610a-d] may take measurements of the signal strength of radio signal(s) transmitted by the control device 230 and forward those measurements to the vehicle control unit 320 where they are triangulated and used to determine the location of the control device 230.” (Ex. 1010, 7:28-32; Ex. 1003, ¶¶ 232-233.)

Clement further discloses that “regions #1-4 may be represented by 4-tuples of signal strength ranges (e.g., sets of signal strength ranges that are expected to be

measured by each of the receivers 610a-d when the control device 230 is in a given region). (Ex. 1010, 8:43-46, 8:51-55; Ex. 1003, ¶¶ 234-235.)

	Region	Region Definition
432a	Region #1	$[(X_1, Y_1), (X_1, Y_2), (X_2, Y_1), (X_2, Y_2)]$
432b	Region #2	$[(X_1, Y_2), (X_1, Y_3), (X_2, Y_2), (X_2, Y_3)]$
432c	Region #3	$[(X_2, Y_2), (X_2, Y_3), (X_3, Y_3), (X_3, Y_2)]$
432d	Region #4	$[(X_2, Y_1), (X_2, Y_2), (X_3, Y_2), (X_3, Y_1)]$

Fig. 5

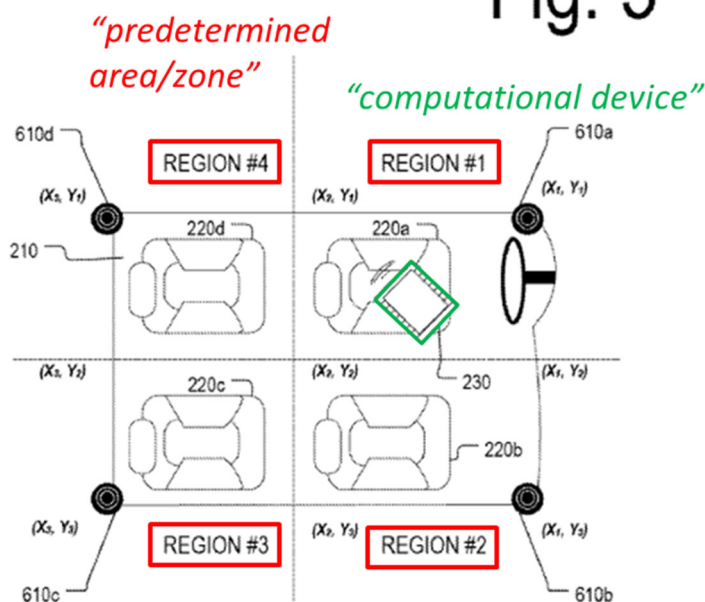


Fig. 6

Ex. 1010, Figs. 5, 6 (Annotated)

A POSA would have understood that the 4-tuple structure disclosed in Clement teaches a “*level of confidence*” in determining the location of the portable control device 230. Each 4-tuple represents a set of expected signal strength ranges

corresponding to the receivers positioned within the vehicle, with each set associated with a specific region, and the limits of each range representing a “*threshold*.” A POSA would have also understood that Clement’s disclosure of each region having its own signal strength range, teaches that the vehicle control unit 320 determines whether the signal strength is above or below a “*threshold*” to be within any specific region. (Ex. 1003, ¶¶ 236-238, 264-266, 290-292.)

B. Ground 2: Claims 3, 10, and 17 are Unpatentable as Obvious Over Clement and Ghabra

1. Rationale to Combine Clement and Ghabra

It would have been obvious to a POSA at the time of the alleged invention to combine the vehicle permission management system for communicating with a portable communication device, as disclosed in Clement, with the known technique of device discovery and positioning (localization), as disclosed in Ghabra, to provide additional functionality and user convenience improvements including passive control, improved security and response time, and conservation of battery life. A POSA would have understood that Clement and Ghabra are complementary technologies that are combinable. (Ex. 1003, ¶ 293.) For example, Clement discloses that “these and other variations and combinations of the features discussed above can be utilized without departing from the subject matter as defined by the claims.” (Ex. 1010, 13:19-24.)

Clement and Ghabra are from the same field—communication between a vehicle system and one or more portable devices. (Ex. 1010, 4:42-46; Ex. 1011, 1:16-20.) Both Clement and Ghabra disclose strategies for determining the location of the portable device relative to the vehicle to facilitate control of specific vehicle functions. (Ex. 1010, 1:24-33; Ex. 1011, 1:16-20; Ex. 1003, ¶¶ 294-295.) Both Clement and Ghabra seek to improve the comfort and user convenience of operating a vehicle. (Ex. 1003, ¶ 296; Ex. 1010, 1:31-33: “Using the portable computing device to provide user input to the vehicle may increase the ease at which users interact with their vehicles[]”; Ex. 1011, 2:13-16: “The present invention has advantages of added convenience, faster response times, and increased security.”)

Clement discloses a “vehicle control unit 320...coupled to the control device 230...operable to receive instructions from the control device 230 to change the state of one or more [] vehicle systems.” (Ex. 1010, 7:8-11.) Clement further discloses that the vehicle control unit 320 can identify “a current location of the portable control device [230] within a passenger compartment of the vehicle, and depending on the current location of the portable control device [230],” permit certain vehicle functions. (Ex. 1010, 1:42-51; *see also*, 7:40-50, Figure 8; Ex. 1003, ¶ 297.)

Ghabra discloses a vehicle system “for localizing a fob in a passive entry sequence wherein it is desired to determine whether the fob is outside the vehicle in the vicinity of a particular door...or inside the vehicle (i.e., a passive engine start

sequence is triggered by a user pressing an engine start switch inside the vehicle).” (Ex. 1011, 4:57-63; Ex. 1003, ¶ 298.)

Early vehicles required manual actuation of a key to enter and start a vehicle, *i.e.*, by inserting the key into a lock or ignition switch. Ghabra explained that a disadvantage of prior art remote-keyless entry (RKE) systems “is that the user must manually actuate the key fob to achieve the desired results.” (Ex. 1011, 1:28-48; Ex. 1003, ¶¶ 299-300.)

Clement discloses a portable computing device that provides instructions to the vehicle wirelessly. (Ex. 1010, 1:24-33.) However, even with the use of a portable computing device, Clement discloses that a user manually actuates buttons on a user interface to control vehicle systems, e.g., “the user interface 900A may provide buttons 910a-j that enable control over different aspects of the operation of the vehicle 101” and...[c]licking on the button 910j [misabeled as 900j in Fig. 9A] may take users to a menu that enables the locking and unlocking of the vehicle’s 101 doors.” (Ex. 1010, 9:55-58, 10:11-12; Ex. 1003, ¶¶ 301-303.)

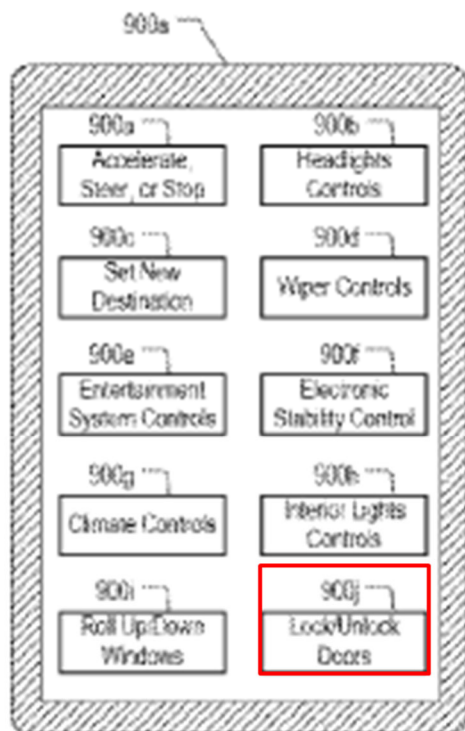


Fig. 9A

Ex. 1010, Fig. 9A (Annotated)

Ghabra discloses a PEPS system that “operate[s] in a hands-free manner” that “has [the] advantages of added convenience [and] faster response times” over existing systems. (Ex. 1011, 1:42-44, 2:13-16; Ex. 1003, ¶¶ 304-305.)

A POSA at the time of the alleged invention would have been motivated to combine the vehicle permission management system disclosed in Clement with the known technique of passive entry and passive start disclosed in Ghabra to yield predictable results, e.g., to expand the functionality of the control device outside of the vehicle and to be able to interact with their vehicle in a “hands-free” manner to

improve user convenience. As Ghabra explains, removing the need for manual actuation provides users with the “added convenience” of interacting with their vehicle. (Ex. 1011, 2:13-14; Ex. 1003, ¶¶ 306-307.)

Both Clement and Ghabra also seek to improve the safety and security of the vehicle. (Ex. 1010, 5:6-17: “Having a permission management system is important with respect to ensuring the safety of the vehicle.”) As Ghabra suggests, the addition of its PEPS system to a vehicle permission management system such as that disclosed in Clement also provides the added benefit of improved security, e.g., “resistance to relay attacks” with faster response times. (Ex. 1011, 1:64-67, 3:57-67, 4:8-29, 4:30-40, 6:55-58.) Ghabra’s system provides improved security by authenticating or authorizing a fob before allowing it to access the vehicle network by using unique identifier numbers or security codes sent using ultra high frequency (UHF) signals. (Ex. 1003, ¶¶ 308-311.)

A POSA at the time of the invention would have recognized, based on the teachings of Ghabra, that the addition of a PEPS system to Clement’s vehicle permission management system also provides the added benefit of conservation of battery life. Ghabra discloses that by sending a wakeup signal in response to a trigger event, its PEPS system aids in “avoid[ing] excessive battery consumption by periodic radio transmission from the fob, [where] the approach of the user to the vehicle is usually sensed by the vehicle, which then wakes up the fob to perform a

security check before actuating a passive entry function.” (Ex. 1011, 1:44-48.) Further, “[p]assive entry communication operat[es] over a much shorter range than RKE communication,” therefore, “an LF signal...is used for passive entry while a much higher frequency RF signal...is used for RKE.” (Ex. 1011, 1:54-58; Ex. 1003, ¶ 312.)

A POSA would have understood how to combine Clement and Ghabra with a reasonable expectation of success. This modification would have been a simple combination of known elements in the prior art, e.g., additional transmitters and receivers to enable the two-way communication model utilized in Ghabra (Ex. 1011, 3:5-8, 2:63-67, 4:19-21, 2:4-9; Ex. 1003, ¶¶ 313-319), along with sensors that provide a trigger signal in response to a user lifting a door handle or pressing an engine start switch. (Ex. 1011, 3:10-15, 4:57-63; Ex. 1003, ¶¶ 320-321.)

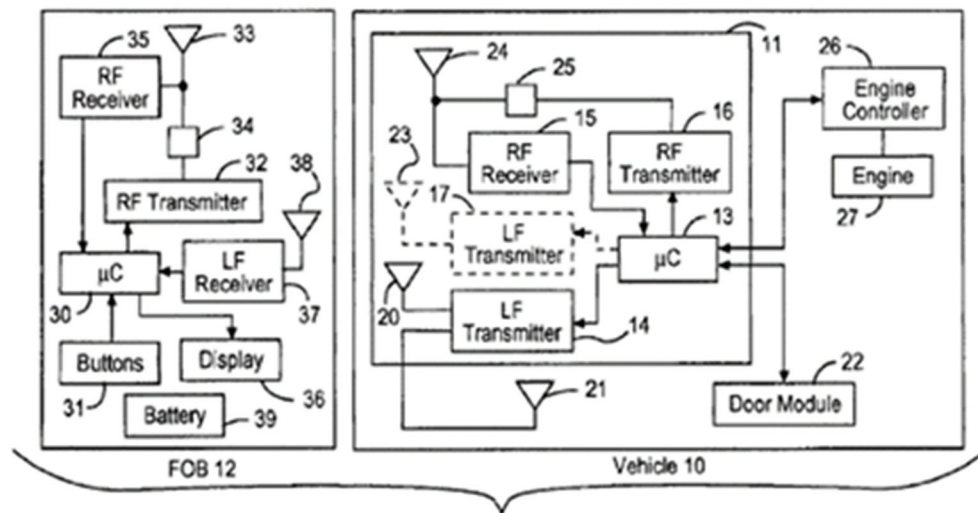
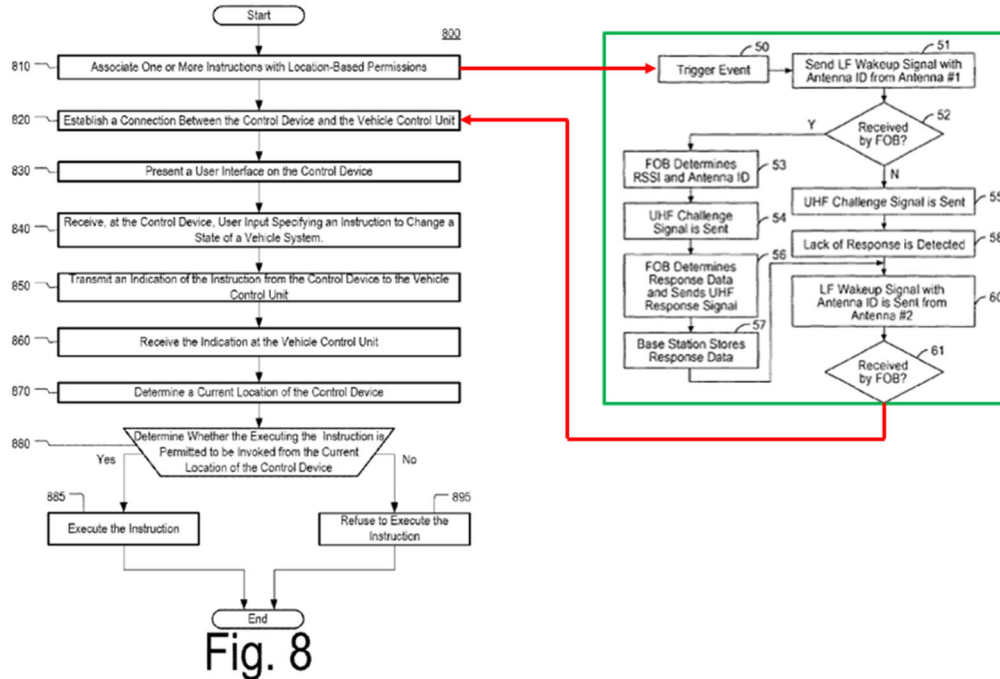


FIG. 1

Ex. 1011, Fig. 1

Regarding software, a POSA would have been motivated to modify Clement's control strategy to include Ghabra's device discovery technique in response to a triggering event, e.g., as shown in the image below. (Ex. 1003, ¶ 322.)



Ex. 1010, Fig. 8; Ex. 1011, Fig. 3 (Annotated)

The Clement-Ghabra combination provides a signal to poll for devices in response to a triggering event and determine if a response signal is received, indicating that a new device is attempting to connect to the vehicle. This modification would have been a straightforward combination of known elements in the prior art, yielding the predictable result of determining whether a new device signal was received by the vehicle control system. (Ex. 1003, ¶¶ 323-325.)

2. Dependent Claims 3, 10, and 17

3[pre]. The method of claim 1, wherein step (a) comprises the substeps:...

10[pre]. The vehicle of claim 8, wherein operation (a) comprises the suboperations:...

***17[pre]. The computer readable medium of claim 15, wherein
function (a) comprises the subfunctions:...***

***[3a]/[10a]/[17a] receiving, by the device discovery daemon,
information from an on board vehicle sensor that a new occupant
has entered the vehicle;***

Clement discloses that the vehicle control unit 320 and the portable device location system 330 computer program (“*device discovery daemon*”) communicate with the control device 230 (“*computational device*”) to receive instructions from the control device 230 for controlling various vehicle systems. (Ex. 1010, 12:8-30; Ex. 1003, ¶¶ 328-329, 352,359.)

Ghabra discloses a PEPS system that “includes a base station or vehicle communication module 11 for communicating with a remote portable fob 12. Base station 11 includes a microcontroller 13 coupled to an LF transmitter 14, an RF receiver 15, and an RF transmitter 16.” (Ex. 1011, 2:63-67; Ex. 1003, ¶ 330.)

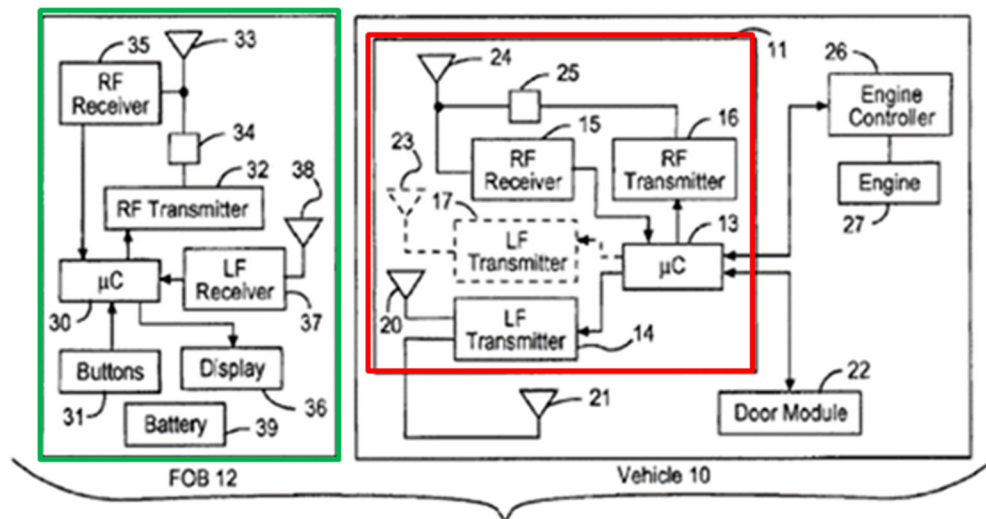


FIG. 1

Ex. 1011, Fig. 1 (Annotated)

Ghabra discloses initiating wireless communication in response to a “trigger event”, i.e., “a trigger event is generated indicating a request for a passive entry function (e.g. lifting a door handle or pressing a start button inside the vehicle).” (Ex. 1011, 5:22-25.) A “[d]oor module 22 is coupled to microcontroller 13 and may preferably include a sensing switch for detecting the lifting of a door handle.” (Ex. 1011, 3:10-13.) Ghabra also discloses that a “trigger signal” could be “triggered by a user pressing an engine start switch inside the vehicle.” (Ex. 1011, 4:57-63.) A POSA would have understood that a trigger signal generated by Ghabra’s door module 22 sensing switch or engine start switch (“*on board vehicle sensor*”) is an indication, or “*information that a new occupant has entered the vehicle.*” (Ex. 1003, ¶¶ 331-337.)

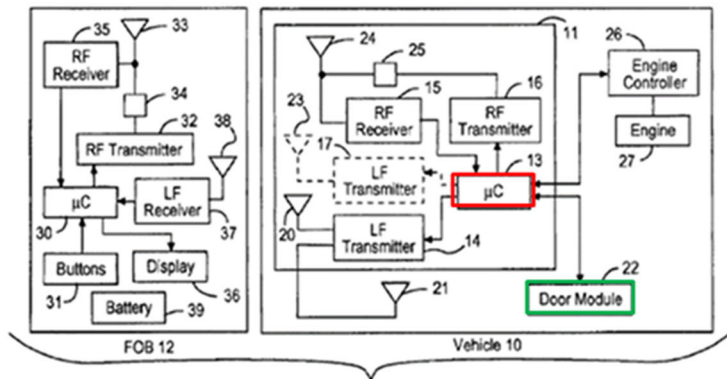


FIG. 1

Ex. 1011, Figs. 1, 3 (Annotated)

Ghabra also discloses determining whether a fob is authorized by using unique identifier numbers or security codes. (Ex. 1011, 3:57-67, 4:8-40.) A POSA would also have understood that the process of authorizing the fob is yet another indication that a new occupant is attempting to connect to the vehicle or has entered the vehicle. (Ex. 1003, ¶¶ 338-339.)

Accordingly, the combination of Clement and Ghabra teaches “*receiving, by the device discovery [computer program] [Clement’s vehicle control unit 320 computer program], information from an on board vehicle sensor [e.g., a trigger signal from the engine start switch or door module 22] that a new occupant has entered the vehicle.*” (Ex. 1003, ¶¶ 337, 353, 360.)

[3b]/[10b]/[17b] in response to the receipt of the information,

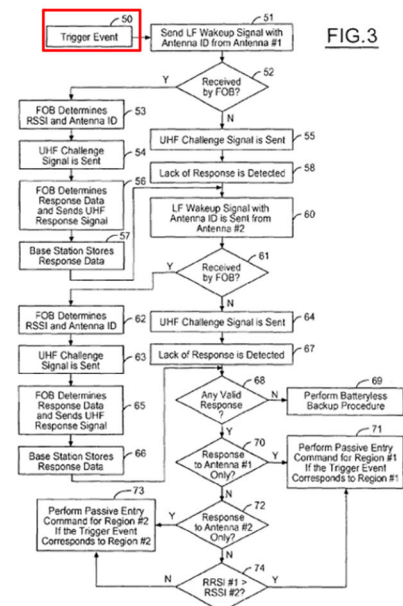


FIG. 3

emitting, by the device discovery daemon, a ping to discover the computational device; and

Ghabra discloses transmitting a wakeup signal 40 (“*ping*”), in response to receiving a trigger signal (“*information*”) to interrogate an area (“*discover*”) for the fob: “A first LF wakeup signal 40 is generated from a first antenna preferentially transmitting to a first area with respect to the vehicle” which “is initiated by a trigger signal from the lifting of a door handle) or inside the vehicle (i.e., a passive engine start sequence is triggered by a user pressing an engine start switch inside the vehicle). “At point 52, either a fob is actually present or not in the area being interrogated by the first antenna.” (Ex. 1011, 4:57-5:3, 5:25-28; Ex. 1003, ¶¶ 340-342.)

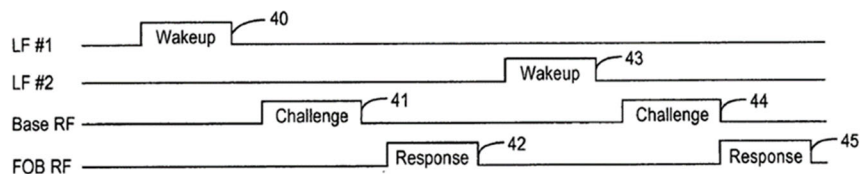
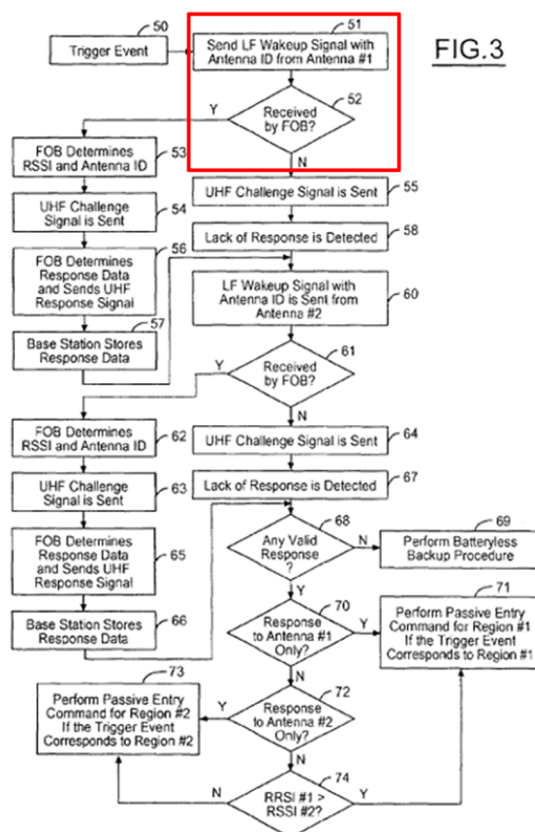


FIG.2

Ex. 1011, Fig. 2



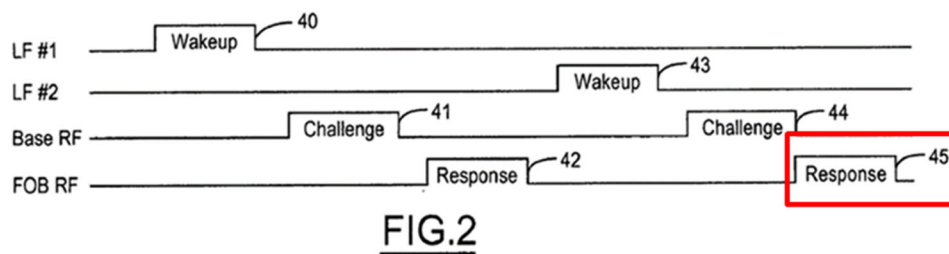
Ex. 1011, Fig. 3 (Annotated)

Thus, the combination of Clement and Ghabra teaches, “*in response to the receipt of the information [trigger signal], emitting, by the device discovery [computer program], a ping to discover the computational device [transmitting a wakeup signal and a challenge signal to interrogate an area for Clement’s control device 230].*” (Ex. 1003, ¶¶ 343, 354, 361.)

[3c]/[10c]/[17c] when a responsive signal is received from the computational device, determining, by the device discovery daemon, that the computational device is attempting to connect to a network and/or communication subsystem of a vehicle.

Ghabra discloses that “[a]fter waiting [for] the fob to awaken, the base station

sends a challenge signal 41 via the base station RF transmitter and antenna.... When the fob is located in the area...the response includes RSSI data showing strong reception. [Otherwise], the RSSI data will reflect a weak signal.” (Ex. 1011, 4:67-5:3, 5:6-9.) Ghabra further discloses that “[i]f a fob was awakened in the desired location being polled, a UHF response signal 45 is sent from the fob RF transmitter to the base station RF receiver.” (Ex. 1011, 5:16-19; Ex. 1003, ¶¶ 344-345.)



Ex. 1011, Fig. 2 (Annotated)

A POSA would have understood that Ghabra’s disclosure of receiving the response signal 45 after transmitting the UHF challenge signal 44 indicates that the fob was awakened in the proper zone and is attempting to access vehicle functionality. Accordingly, the combination of Clement and Ghabra teaches “*when a responsive signal is received from the computational device [e.g., response 45], determining, by the device discovery [computer program], that the computational device is attempting to connect to a network and/or communication subsystem of a vehicle.*” (Ex. 1003, ¶¶ 346-348, 355, 362.)

C. Ground 3: Claims 1-2, 4, 6-9, 11, 13-16, 18, and 20-21 are Unpatentable as Obvious Over Lickfelt

1. Independent Claims 1, 8, 15

1[pre]/8[pre]/15[pre]

Lickfelt discloses “a passive entry system 10 for a vehicle 12 [that] includes an ECU 16.” (Ex. 1012, [0010].) Lickfelt further discloses that “[t]he ECU 16 stores data associated with the signals in a memory 50 associated with the ECU 16.” (Ex. 1012, [0019]; Ex. 1003, ¶¶ 363-364, 428-431, 453.)

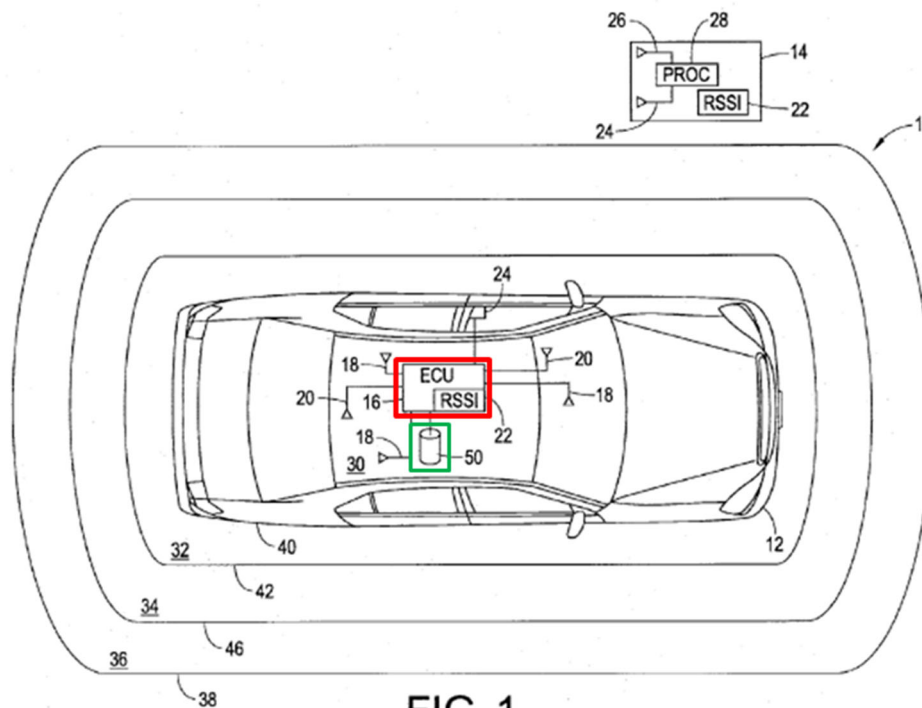


FIG. 1

Ex. 1012, Fig. 1 (Annotated)

Lickfelt discloses, with reference to Figure 2, “[a] method for remotely controlling locks on a vehicle.” (Ex. 1012, [0024]-[0025]; Ex. 1003, ¶¶ 365-366, 453-454.)

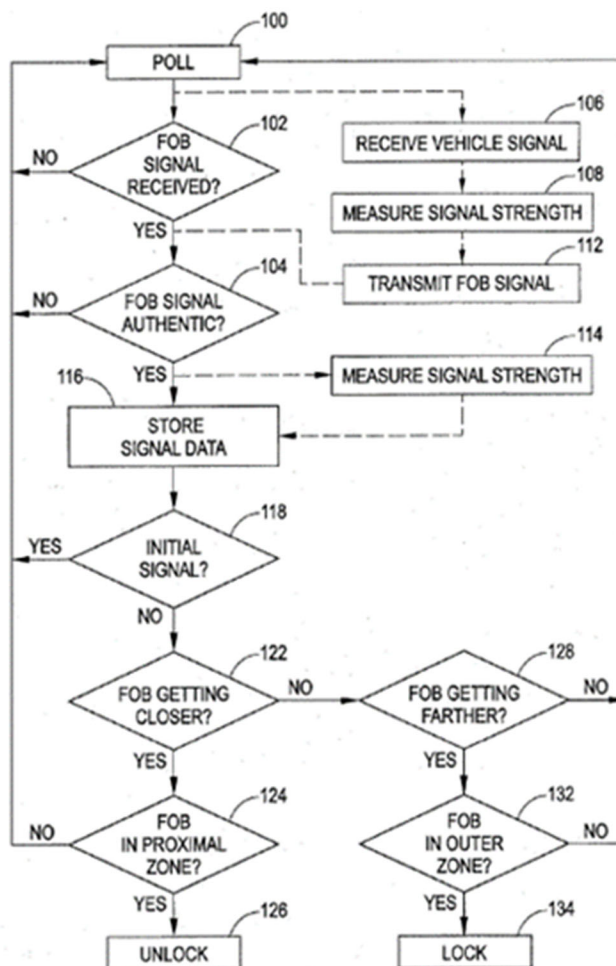


FIG. 2

Ex. 1012, Fig. 2

A POSA would have understood that data, including the computer program associated with the method illustrated in Figure 2, would have been stored in the memory 50 which is a “*tangible and non-transient computer readable medium.*” Accordingly, a POSA would have understood that Lickfelt’s ECU 16 includes a microprocessor that executes a computer program, such as the method described with reference to Figure 2. (Ex. 1003, ¶ 455.)

[1a]/[8a]

Petitioner proposes that the term “*daemon*” be construed as “computer program.” A POSA would have understood that the ECU 16 includes both hardware and software based on, for example, Lickfelt’s description of the ECU 16 as being “in communication with a transmitter 18 and a receiver 20”, “poll[ing] for fobs” and “configured to determine whether the fob 14 is getting closer to or farther from the vehicle 12.” (Ex. 1012, [0010], [0025], [0027].) Further, it was well-known that automotive ECU’s included microprocessors. (Ex. 1050, 94; Ex. 1003, ¶¶ 367-369, 432-433.)

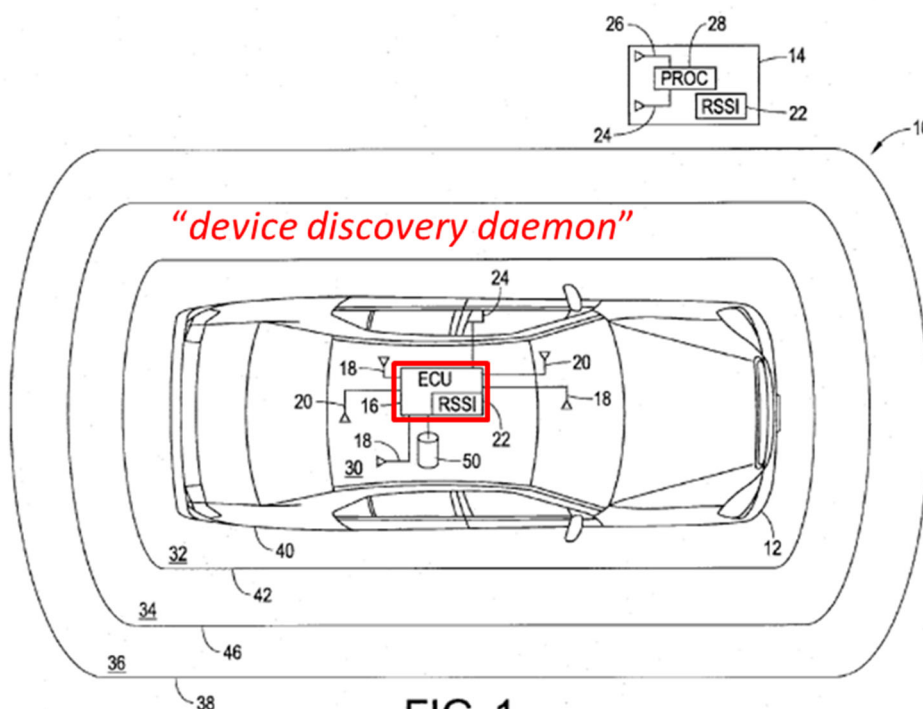


FIG. 1

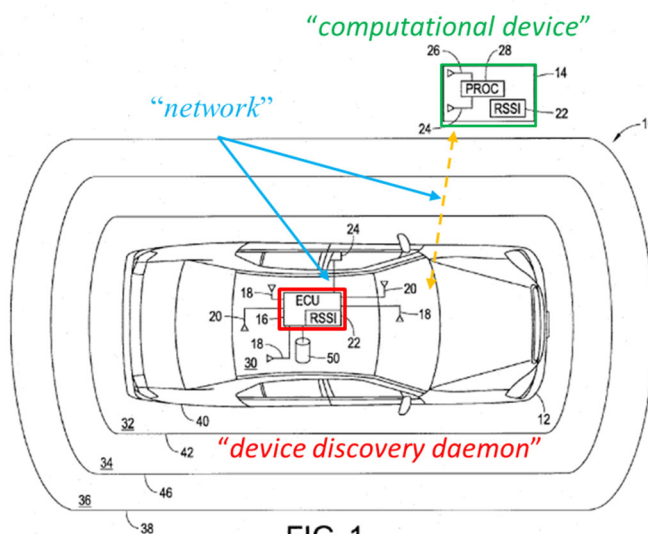
Ex. 1012, Fig. 1 (Annotated)

[1a]/[8a]-[8b]/15[pre]-[15a]

Lickfelt discloses that the ECU 16 (“*device discovery* [computer program]”)

“is in communication with a transmitter 18 and a receiver 20” on the vehicle that communicates with a fob 14 (“*computational device*”). (Ex. 1012, [0010].) The fob 14 can “be combined with or incorporated into other known devices such as a mobile phone or other small electronic device.” (Ex. 1012, [0012]; Ex. 1003, ¶¶ 370-371.)

Lickfelt discloses that the passive entry “system 10 also includes a lock 24 that is in communication with the ECU 16.” (Ex. 1012, [0015].) A POSA would have understood the ECU 16 communicates with the lock 24 over a vehicle “*network*.” As illustrated in the image below, the wireless and wired connections between the ECU 16, the fob 14, and the lock 24 provide a “*network*” to enable the fob 14 to control vehicle system functionality (e.g., passive entry) through the ECU 16. (Ex. 1003, ¶¶ 380-381.)



Ex. 1012, Fig. 1 (Annotated)

Lickfelt discloses that the “system 10 can include an RSSI circuit 22 to measure signal strength” and that the “RSSI circuit 22 can be associated with the ECU 16 on the vehicle.” (Ex. 1012, [0011].) The ECU 16 is “configured to determine whether the fob 14 is getting closer to or farther from the vehicle 12 based on the measured signal strength.” (Ex. 1012, [0013].) Lickfelt discloses that “when an operator approaches the vehicle 12 carrying the fob 14, the ECU 16 polls for the fob by transmitting LF signals.” (Ex. 1012, [0019]; Ex. 1003, ¶¶ 372-374.)

Lickfelt discloses in Figure 2 that “[a]t 100, the ECU 16...polls for fobs, such as the fob 14. At 102, a determination is made as to whether a reply signal is received from a fob. If no reply signal is received, at 102, the algorithm reverts to 100 and continues to poll for fobs.” (Ex. 1012, [0025]; Ex. 1003, ¶¶ 375-377.)

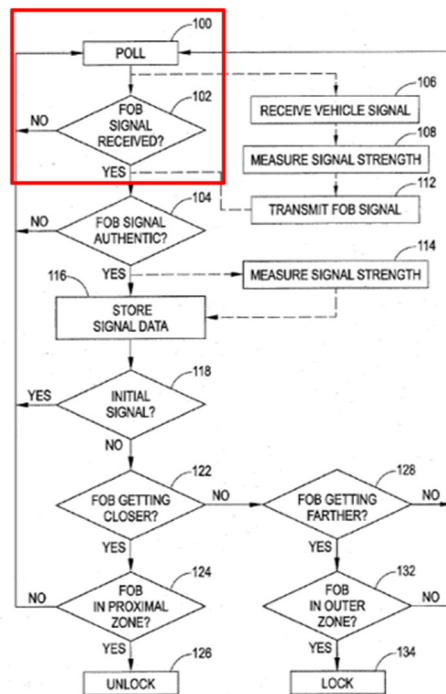


FIG. 2

Ex. 1012, Fig. 2 (Annotated)

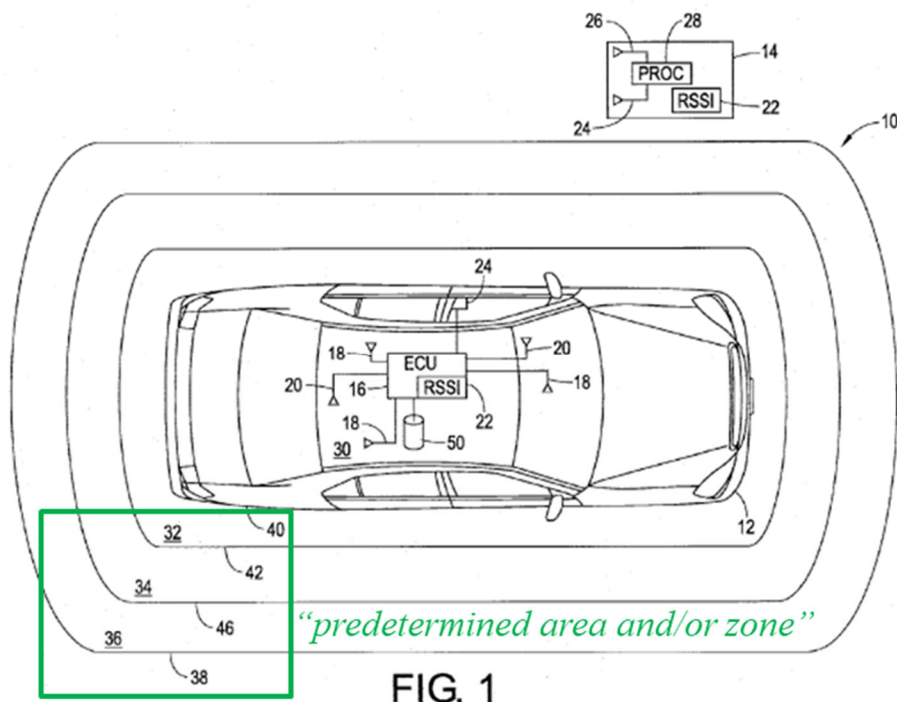
A POSA would have understood that Bluetooth was a very popular protocol used by vehicle systems for transmitting wireless signals (RF signals) to/from wireless devices. Bluetooth includes aspects of device discovery in which a computer program runs in the background to discover wireless devices. (Ex. 1003, ¶¶ 97-101; Ex. 1052, Vol. 2, 150-151, 160-163; Ex. 1065, 2; Ex. 1063, 7.) Lickfelt discloses that “the fob 14 transmits radio frequency (“RF”) signals and receives LF EM signals...the fob 14 could transmit and receive other types of wireless signals, if desired.” (Ex. 1012, [0012].) Accordingly, a POSA would have understood that the ECU 16 operates in the background to detect the presence of the fob 14 and in

response to such detection, the ECU 16 determines that the fob 14 is “*attempting to connect to a network and/or communication subsystem of a vehicle.*” (Ex. 1003, ¶¶ 96-102, 378-380.)

A POSA would have understood that a user carrying a fob and approaching a vehicle having a passive entry system is attempting to connect to a vehicle “*network*” to unlock the door. A POSA would have further understood that by polling for the fob 14 as the user approaches, the ECU 16 is executing software to “*determin[e]*” that the fob 14 is “*connected to or attempting to connect to a network and/or communication subsystem of a vehicle.*” (Ex. 1003, ¶¶ 381-382, 432-433, 456-457.)

[1b]/[8c]/[15b]

Lickfelt discloses that “[t]he entry system 10 is configured to define a plurality of zones with respect to the vehicle 12 . . . includ[ing] an internal zone 30, a proximal zone 32, a hysteresis zone 34, and an outer zone 36.” (Ex. 1012, ¶ 16; Ex. 1003, ¶ 383.)



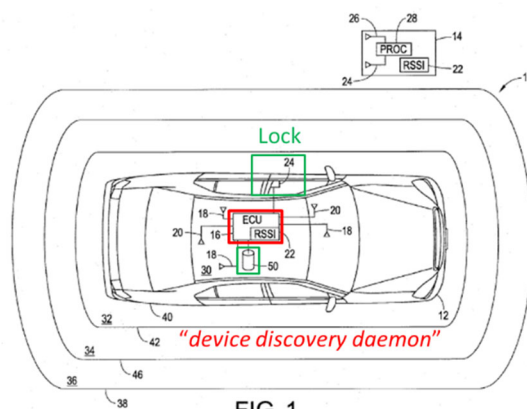
Ex. 1012, Fig. 1 (Annotated)

Lickfelt discloses that the ECU 16 is “configured to determine whether the fob 14 is getting closer to or farther from the vehicle 12 based on the measured signal strength.” (Ex. 1012, [0013].) Lickfelt further discloses that the ECU 16 determines “[t]he zone in which the fob 14 is located...based on the signal strength of the respective signals and triangulation... .” (Ex. 1012, [0020]; Ex. 1003, ¶¶ 384-386, 434, 458.)

[1c]-[1d]/[8d]-[8e]/[15c]-[15d]

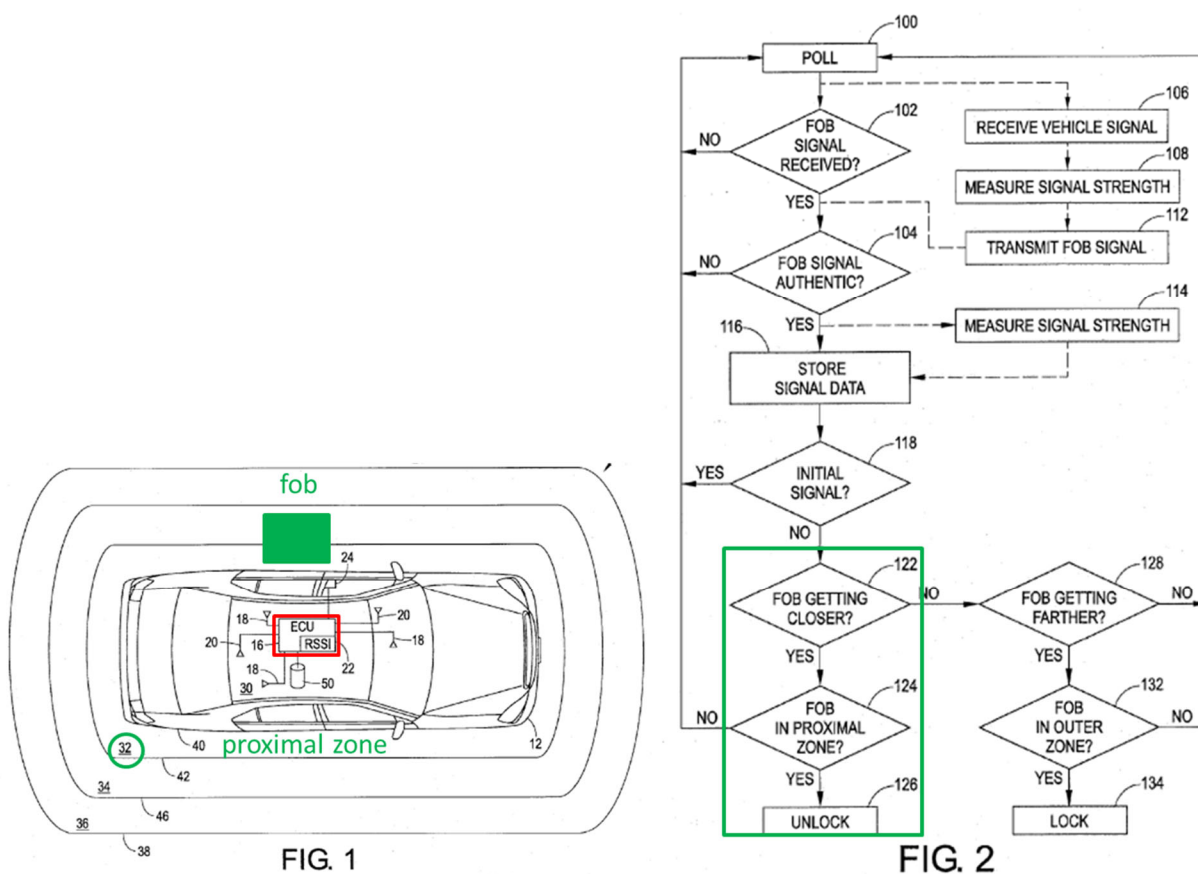
As explained above, Petitioner construes the term “*access or attempt to access ...*” as “*access or attempt to access [functionality of]... .*” Lickfelt discloses controlling access to vehicle functionality based on the location of the computational

device as claimed. (Ex. 1003, ¶¶ 389-391.) Lickfelt discloses, with reference to Figure 1, that the passive entry system 10 includes “a lock 24 that is in communication with the ECU 16” and that “the vehicle door lock 24 locks or unlocks in response to the ECU 16 determining that the fob 14 is getting closer to or farther from the vehicle 12.” (Ex. 1012, [0015], [0018].)



Ex. 1012, Fig. 1 (Annotated)

Lickfelt also discloses, with reference to Figure 2, a series of determinations at steps 122-126 to control the lock 24, which a POSA would have understood to be “*applying...rules.*” For example, Lickfelt discloses, that the ECU 16 unlocks the lock 24 at step 126, “[i]f it is determined that both the fob 14 is getting closer to the vehicle, at 122, and that the last signal sent from the fob 14 to the receiver 20 was sent with the fob located within the proximal zone 34 [*sic* 32], at 124.” (Ex. 1012, [0027]; Ex. 1003, ¶¶ 387-388, 392-393, 435-436, 459-460.)

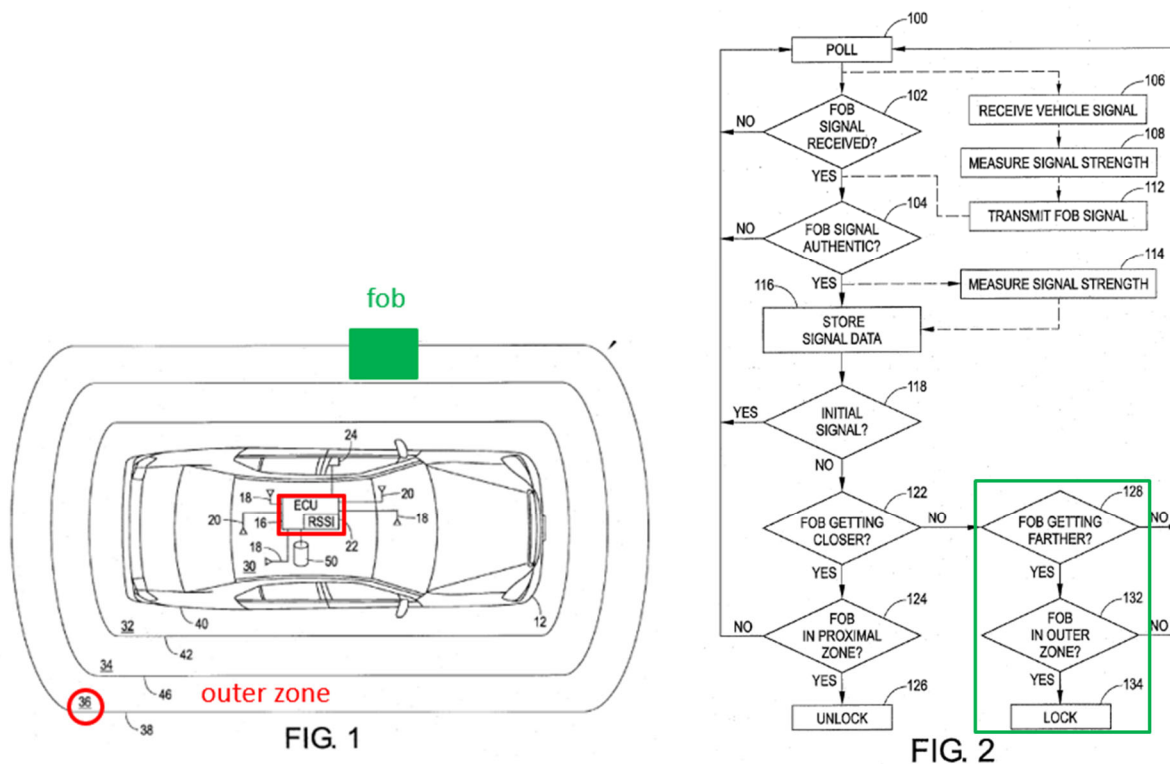


Ex. 1012, Figs. 1, 2 (Annotated)

[1e]/[8f]/[15e]

As explained above, Petitioner construes the term “*access or attempt to access ...*” as “*access or attempt to access [functionality of]... .*” Lickfelt discloses controlling access to vehicle functionality based on the location of the computational device as claimed. Lickfelt discloses that if the ECU 16 determines that the fob 14 is not within the proximal zone 32, and instead “the fob is within the outer zone 36, then the lock 24 locks.” (Ex. 1012, [0023].) Thereby the ECU 16 does “*not permit[]*”

the fob (“computational device”) from “access[ing functionality of] the vehicle network.” (Ex. 1003, ¶¶ 394-397, 437, 461.)



Ex. 1012, Figs. 1, 2 (Annotated)

2. Dependent Claims 2, 4, 6-7, 9, 11, 13-14, 16, 18, and 20-21

[2a]/[9a]/[16a]

Lickfelt discloses that “the fob 14 can include the RSSI circuit 22 for measuring the strength of the polling signal.” (Ex. 1012, [0026].) Lickfelt further discloses that “[t]he zone data can be determined based on the measured signal strength and the boundaries of the zones, which can be defined by predetermined distances from the vehicle and coordinates defining zones with respect to the

vehicle.” A POSA would have understood that this modification of shifting processing from the RSSI circuit 22 to the fob 14 is just a simple substitution of one known element for another to obtain predictable results, e.g., reducing power consumption by the vehicle system. (Ex. 1012, [0031]; Ex. 1003, ¶¶ 398-402, 441, 465.)

[2b]/[9b]/[16b]

Lickfelt discloses that “the fob 14, similar to known fobs, is typically small enough to be easily carried by an operator of the vehicle 12 and could be combined with or incorporated into other known devices such as a mobile phone or other small electronic device.” (Ex. 1012, [0012].) A smart phone refers to a mobile phone with advanced computing capabilities and a POSA would have understood Lickfelt’s description of incorporating the fob 14 into a mobile phone, indicates that the “*computational device is one or more of a...smart phone.*” (Ex. 1003, ¶¶ 403-405, 442, 466.)

[2c]/[9c]/[16c]

Lickfelt discloses that if “it is determined that the fob 14 is located in the internal zone 30, then it is assumed the fob 14 is located within the vehicle, e.g. within the cabin or the trunk of the vehicle.” (Ex. 1012, [0016].) The cabin of the vehicle refers to “*at least part of the passenger compartment.*” (Ex. 1003, ¶¶ 406-407, 443, 467.)

[4]/[11]/[18]

Lickfelt discloses vehicle receivers 20 (“*access points*”) for receiving signals from the fob (“*computational device*”), *i.e.*, “[t]he receiver 20 is on the vehicle...for receiving fob signals transmitted from the fob 20...and two receivers 20 are shown in FIG. 1.” (Ex. 1012, [0010]; Ex. 1003, ¶¶ 408-410.)

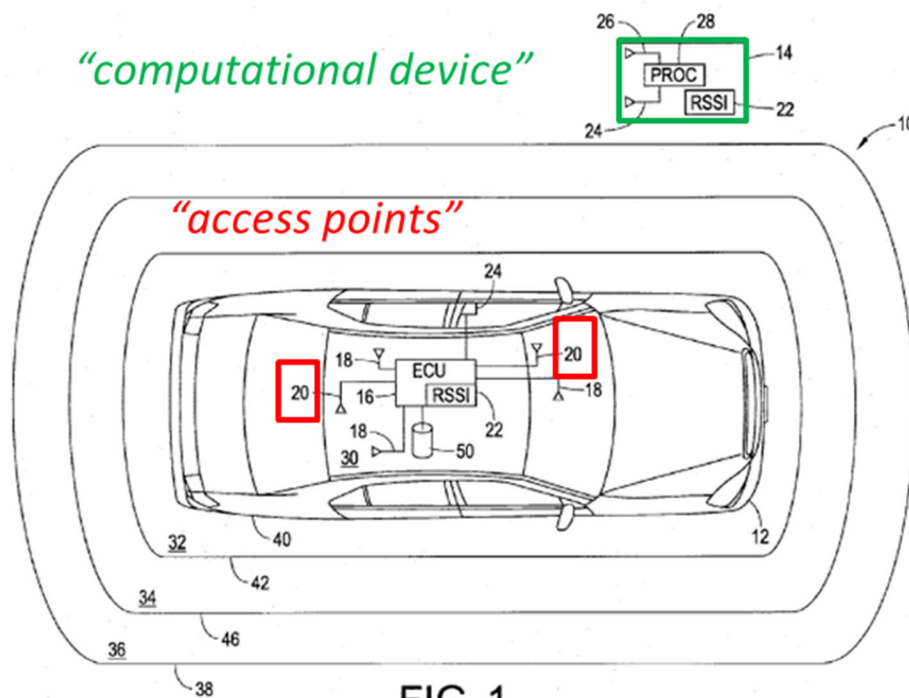


FIG. 1

Ex. 1012, Fig. 1 (Annotated)

Lickfelt further discloses determining the location of the fob 14 (“*computational device*”) using triangulation based on the received signal strength:

The zone in which the fob 14 is located can be determined based on the signal strength of the respective signals and triangulation by knowing

the respective transmitter that initiated the polling signal or the respective receiver that received the fob signal.

(Ex. 1012, [0020]; Ex. 1003, ¶¶ 409-413, 444-445, 468-469.)

[6]/[13]/[20]

As explained above with reference to claim 4, Lickfelt discloses determining the location of the fob (“*computational device*”) based on triangulation. (Ex. 1003, ¶¶ 408-413.) Lickfelt also discloses using signal strength from the fob, “The ECU 16 is configured to determine whether the fob 14 is getting closer to or farther from the vehicle 12 based on the measured signal strengths” received by receiver 20. (Ex. 1012, [0013], [0010]; Ex. 1003, ¶¶ 414-421.)

Lickfelt further discloses determining the location of the fob 14 (“*computational device*”) based on comparing signal strength signals received at different times to determine if the fob is moving, “The ECU 16 can determine whether the fob 14 is getting closer to or farther from the vehicle 12 by comparing signal strength and transmitter identification data from earlier received signals to signal strength and transmitter identification data from later received signals.” (Ex. 1012, [0013]; Ex. 1003, ¶¶ 422-423, 446-448, 470-472.)

[7]/[14]/[21]

Lickfelt discloses that “[t]he ECU 16 can...determine whether the fob 14 is getting closer to or farther from the vehicle 12 based on comparing the data

associated with the initial signal (fob or polling signal) compared to the data associated with the subsequent signal (fob or polling).” (Ex. 1012, [0020].) Lickfelt further discloses that “if the signal strength of the subsequent signal (fob or polling signal) is greater than the signal strength of the initial signal, then it can be deduced that the fob 14 is getting closer to the vehicle 12.” (Ex. 1012, [0020]; Ex. 1003, ¶¶ 424-425.)

Lickfelt discloses a “*level of confidence*” because the ECU 16 stores previous signal data and compares that “*threshold*” value to a subsequent signal strength value to determine the location of the device based the relationship of those values. If the signal strength of the subsequent signal is greater than the initial or stored signal, a POSA would have understood that this indicates a higher probability that the fob 14 is getting closer to the vehicle 12 because signal strength generally increases as the distance between a transmitter (e.g. a fob) and a receiver (e.g. receiver in ECU) decreases. (Ex. 1003, ¶ 426-427.) A POSA would have further understood that the ability for the ECU 16 to determine a probability level based on the compared signal strength values teaches that the ECU 16 determines a “*level of confidence*,” because the temporal comparison of signal strength values serves as an indicator of a confidence-based mechanism. (Ex. 1003, ¶¶ 426-427, 449-451, 473-475.)

D. Ground 4: Claims 3, 5, 10, 12, 17, and 19 are Unpatentable as Obvious Over Lickfelt and Ghabra

1. Rationale to Combine Lickfelt and Ghabra

A POSA at the time of the alleged invention would have had several reasons to combine the teachings of Ghabra to Lickfelt to improve the system described in Lickfelt, which renders obvious the claims challenged in Ground 4. It would have been obvious to a POSA at the time of the alleged invention to combine the passive entry system for a vehicle as disclosed in Lickfelt, with the known technique of device discovery and positioning (localization) as disclosed in Ghabra to provide additional functionality and user convenience improvements including passive start functionality and improved security. A POSA would have understood that Lickfelt and Ghabra are complementary technologies that are combinable. (Ex. 1003, ¶ 476.) For example, Lickfelt discloses that “[m]odifications and alterations will occur to those upon reading and understanding the preceding detailed description” and “various of the above-disclosed and other features and functions, or alternatives or varieties thereof, may be desirably combined into many other different systems or applications.” (Ex. 1012, [0033]-[0034].)

Lickfelt and Ghabra are from the same field—communication between a passive entry vehicle system and one or more portable devices. (Ex. 1012, [0005], [0012]; Ex. 1011, 1:16-20.) Both Lickfelt and Ghabra disclose strategies to determine the location of the portable device relative to the vehicle and to facilitate control of specific vehicle functions from the portable device. (Ex. 1012, [0013],

[0032]; Ex. 1011, 1:16-20; Ex. 1003, ¶¶ 477-478.)

Both Lickfelt and Ghabra seek to improve the comfort and user convenience of operating a vehicle. (Ex. 1003, ¶ 479.) For example, Lickfelt describes automatic locking/unlocking based on fob movement and zone location, improving user convenience and system reliability. (Ex. 1012, [0018], [0022].) Ghabra's teaching provides "advantages of added convenience, faster response times, and increased security." (Ex. 1011, 2:13-16.)

Lickfelt discloses a passive "entry system for a vehicle [that] includes a fob, a transmitter on the vehicle, a receiver on the vehicle, a control unit on the vehicle, and a vehicle lock in communication with the control unit." (Ex. 1012, [0005], [0012].) Lickfelt further discloses that the ECU 16 is "configured to determine whether the fob 14 is getting closer to or farther from the vehicle 12 based on the measured signal strength;" and based on the location of the fob 14, "unlock [or lock] the door lock 24." (Ex. 1012, [0013], [0025], Figures 1-2.) Lickfelt explains that "[d]etermining [the location of] the fob 14...is based on the measured signal strengths as determined in the RSSI circuit 22." (Ex. 1012, [0032]; Ex. 1003, ¶¶ 480-481.)

Ghabra discloses a PEPS system "for localizing a fob in a passive entry sequence wherein it is desired to determine whether the fob is outside the vehicle in the vicinity of a particular door...or inside the vehicle (i.e., a passive engine start

sequence is triggered by a user pressing an engine start switch inside the vehicle).” (Ex. 1011, 4:57-63.) Ghabra’s PEPS system “operate[s] in a hands-free manner” and “has [the] advantages of added convenience [and] faster response times” over existing systems. (Ex. 1011, 1:42-43, 2:13-14; Ex. 1003, ¶ 482.)

Lickfelt acknowledges prior art passive start systems, but does not disclose that its passive entry system 10 provides passive start functionality. (Ex. 1012, [0001].) A POSA would have been motivated to combine the passive entry system disclosed in Lickfelt with the passive start system disclosed in Ghabra to yield predictable results, e.g., to expand the functionality of Lickfelt’s system inside of the vehicle and to be able to interact with their vehicle in a “hands-free” manner within the passenger compartment, thereby eliminating the need for manual actuation for starting the vehicle. (Ex. 1003, ¶ 483.)

The addition of Ghabra’s PEPS system to Lickfelt’s vehicle communication system also provides the added benefit of improved security. Lickfelt describes determining if a fob is authentic before granting access to the vehicle. “If a reply signal is received at 102, then at 104, a determination is made as to whether the reply signal is authentic.” (Ex. 1012, [0025].) However, Lickfelt does not describe how it determines such authenticity. (Ex. 1003, ¶¶ 484-485.)

Prior art passive entry systems were susceptible to thieves intercepting wireless communication in a “relay attack.” (Ex. 1011, 1:64-67.) Ghabra’s system

provides improved security, e.g., “resistance to relay attacks” with faster response time by authenticating or authorizing a fob before allowing it to access the vehicle network by using unique identifier numbers or security codes sent using an ultra high frequency (UHF) signal. (Ex. 1011, 3:57-67, 4:8-29, 4:30-40, 6:55-58; Ex. 1003, ¶486.)

Ghabra discloses that determining whether a fob is authorized or not is based on unique identifier numbers or security codes. Ghabra explains that after the LF wakeup signal is sent “RF transmitter 16 in base station 11 is used to broadcast a UHF challenge signal including [a] random number [to fob 12].” (Ex. 1011, 4:11-13.) Ghabra further explains that the fob 12 “passed the random number through [a] known mathematical transformation. The resulting transformed number is included in [the] response data” sent back to the vehicle. (Ex. 1011, 4:13-19.) Then, the “microcontroller 13 checks the transformed number as received from the fob 12 with its own results of the transformation and determines the UHF response signal to be valid if the transformed numbers match.” (Ex. 1011, 4:25-29; Ex. 1003, ¶¶ 487-489.)

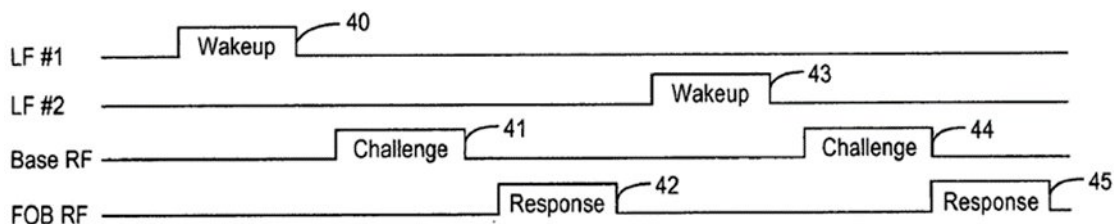


FIG.2

Ex. 1011, Fig. 2

A POSA would have also been motivated to combine Lickfelt and Ghabra to use Ghabra's localization technique to restrict functionality based on location and authenticity of the fob to provide an additional safety feature to the vehicle system. For example, the vehicle cannot be started using the passive engine start function unless an occupant is properly located in the passenger compartment. This eliminates the chance that the vehicle could be improperly started without an occupant in the passenger compartment or the vehicle altogether. (Ex. 1003, ¶ 489.)

A POSA would have understood how to combine Lickfelt and Ghabra with a reasonable expectation of success. This modification would have been a simple combination of known elements in the prior art, e.g., at least one RF (or UHF) receiver and transmitter to enable the two-way communication model utilized in Ghabra (Ex. 1011, 3:43-45, 2:63-67, 4:19-21, 2:4-10; Ex. 1003, ¶¶ 493-495), along with sensors that provide a trigger signal in response to a user lifting a door handle or pressing an engine start switch. (Ex. 1011, 3:10-15, 4:57-63; Ex. 1003, ¶¶ 490-496.)

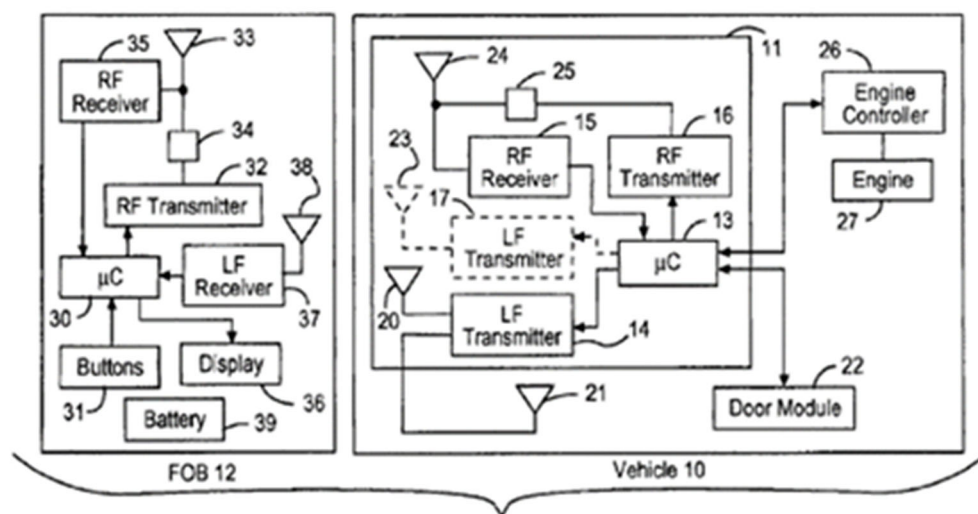


FIG. 1

Ex. 1011, Fig. 1

Regarding software, a POSA would have been motivated to modify Lickfelt to include Ghabra's device discovery technique in response to a triggering event, e.g., as shown in the image below:

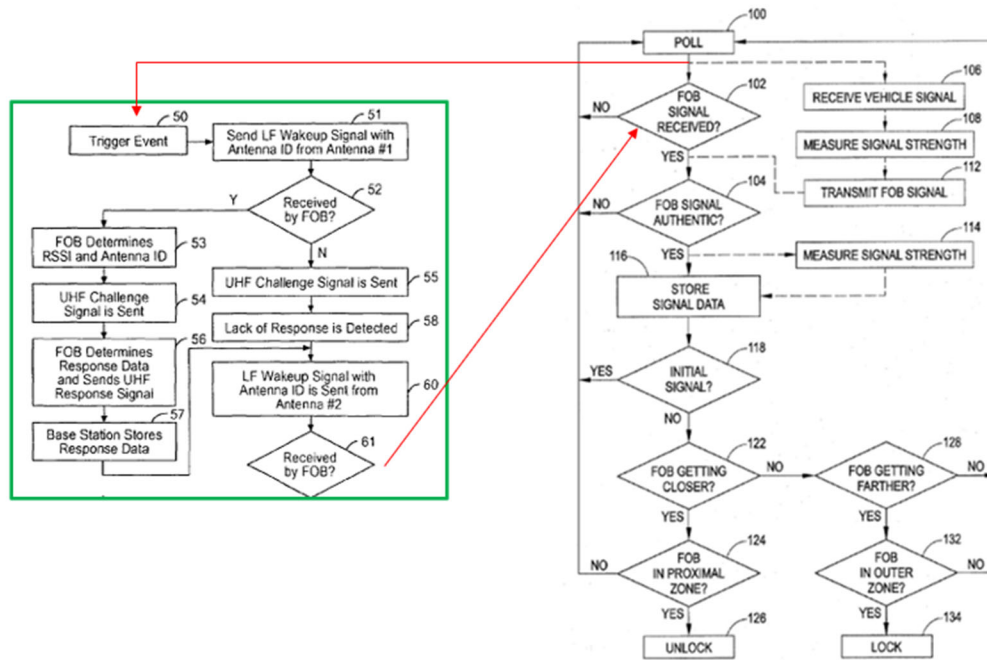


FIG. 2

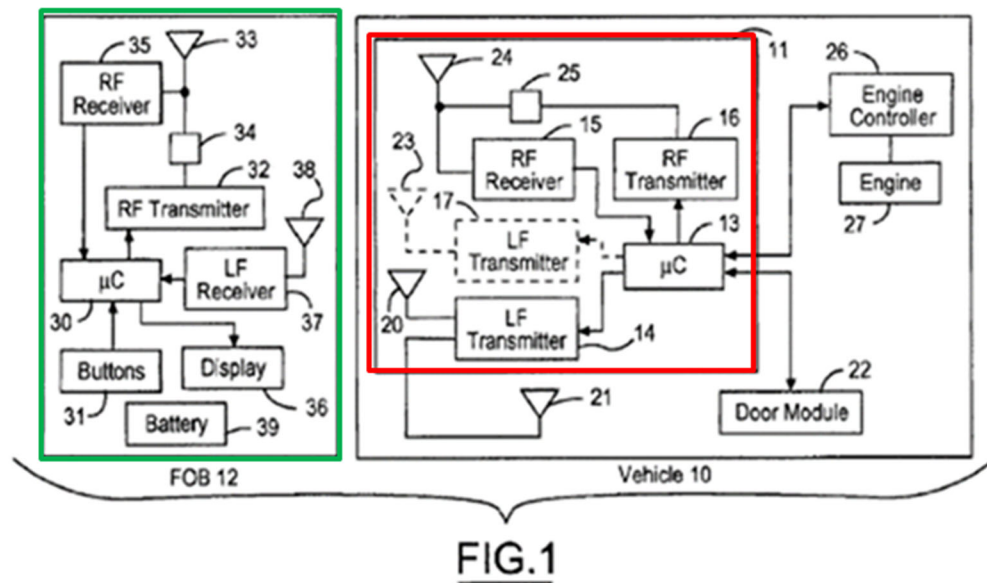
Ex. 1012, Fig. 2; Ex. 1011, Fig. 3 (Cropped and Annotated)

The modification to Lickfelt's communication strategy would include the ECU sending out a signal to poll for devices in response to a triggering event and determining if a response signal was received, indicating that a new device is attempting to connect to the vehicle. (Ex. 1003, ¶¶ 496-498.) These modifications would have been a straightforward and well-known combination of known elements in the prior art, e.g., engine start buttons/sensors, yielding the predictable result of determining whether a new device signal was received by the vehicle control system. (Ex. 1003, ¶¶ 499-500.)

3[pre]-[3a]/10[pre]-[10a]/17[pre]-[17a]

Lickfelt discloses a vehicle 12 that includes a passive entry system 10 with an ECU 16 (“*device discovery* [computer program]”). (Ex. 1012, [0010].) Lickfelt further discloses a fob 14 (“*computational device*”) that transmits and receives signals from the vehicle 12. (Ex. 1012, [0010], [0012]; Ex. 1003, ¶¶ 503-504, 538, 548.)

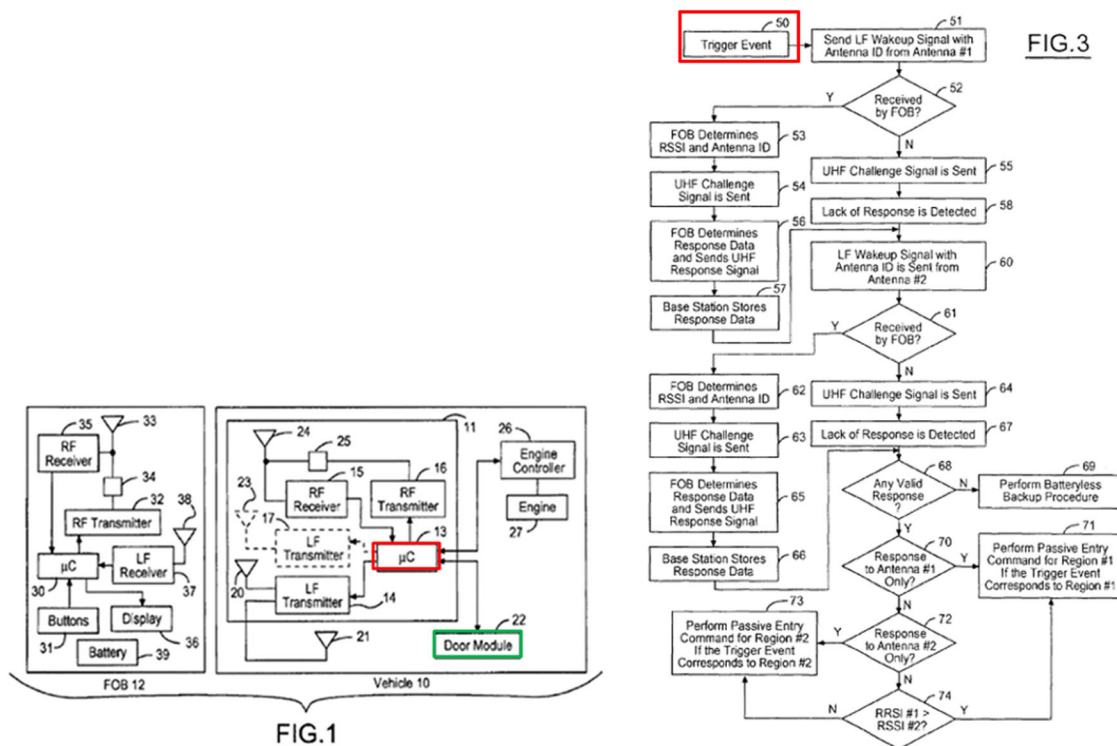
Ghabra discloses a PEPS system that “includes a base station or vehicle communication module 11 for communicating with a remote portable fob 12. Base station 11 includes a microcontroller 13 coupled to an LF transmitter 14, an RF receiver 15, and an RF transmitter 16.” (Ex. 1011, 2:63-3:15; Ex. 1003, ¶ 505.)



Ex. 1011, Fig. 1 (Annotated)

Ghabra discloses initiating wireless communication in response to a “trigger event” e.g., “a user pressing an engine start switch inside the vehicle.” (Ex. 1011, 4:62-63.) A POSA would have understood that a trigger signal generated by

Ghabra's engine start switch (*"on board vehicle sensor"*) is an indication, or *"information that a new occupant has entered the vehicle."* (Ex. 1003, ¶¶ 506-512.)



Ex. 1011, Figs. 1, 3 (Annotated)

Ghabra also discloses determining whether a fob is authorized by using unique identifier numbers or security codes. (Ex. 1011, 3:57-67, 4:8-40.) A POSA would also have understood that the process of authorizing the fob is yet another indication that a new occupant is attempting to connect to the vehicle or has entered the vehicle. (Ex. 1003, ¶¶ 512-514, 539, 549.)

[3b]/[10b]/[17b]

Ghabra discloses transmitting a wakeup signal 40 (*"ping"*), in response to receiving a trigger signal (*"information"*) to interrogate an area (*"discover"*) for the

fob: “A first LF wakeup signal 40 is generated from a first antenna preferentially transmitting to a first area with respect to the vehicle” which “is initiated by a trigger signal from the lifting of a door handle) or inside the vehicle (i.e., a passive engine start sequence is triggered by a user pressing an engine start switch inside the vehicle). (Ex. 1011, 4:63-5:3.) “At point 52, either a fob is actually present or not in the area being interrogated by the first antenna.” (Ex. 1011, 5:25-28; Ex. 1003, ¶¶ 515-516.)

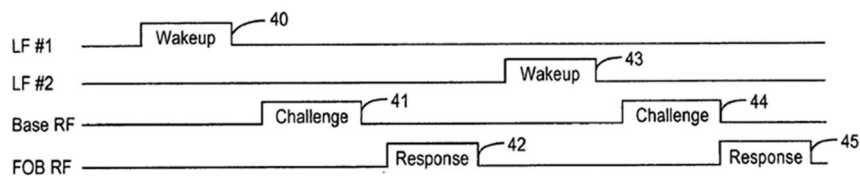
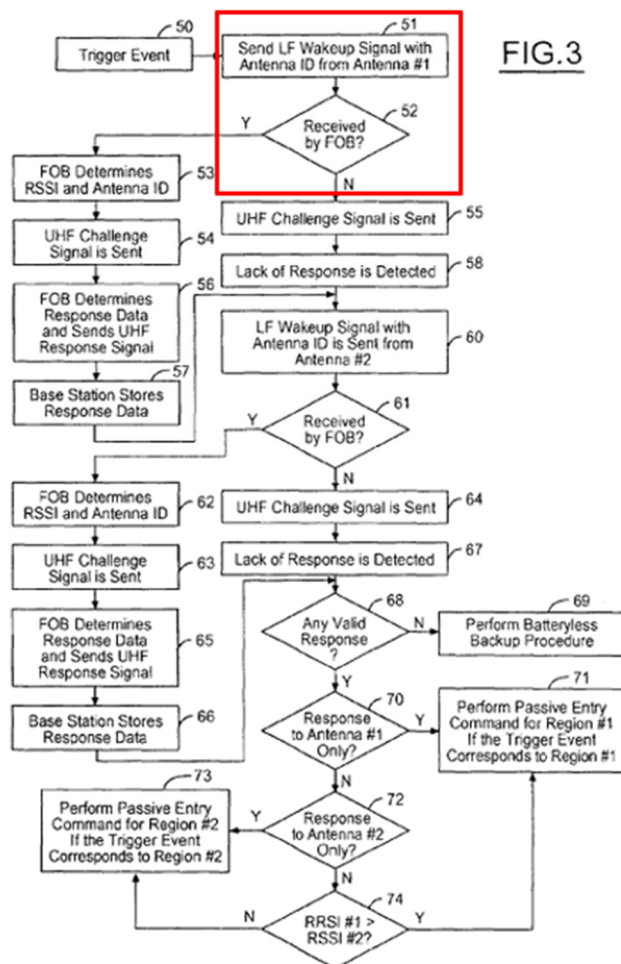


FIG.2

Ex. 1011, Fig. 2



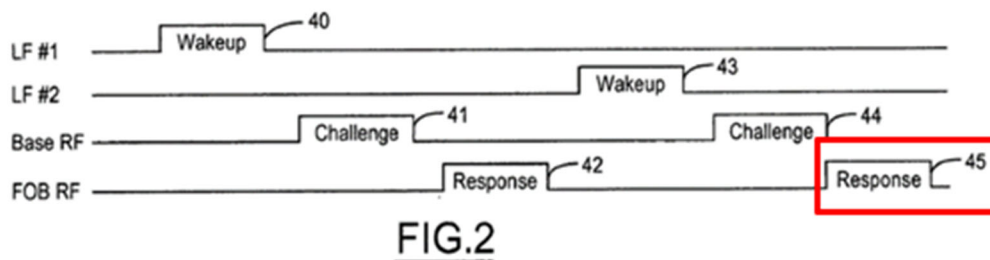
Ex. 1011, Fig. 3 (Annotated)

Thus, the combination of Lickfelt and Ghabra teaches, “*in response to the receipt of the information [trigger signal], emitting, by the device discovery [computer program], a ping to discover the computational device [transmitting a wakeup signal and a challenge signal to interrogate an area for Lickfelt’s fob 14].*” (Ex. 1003, ¶¶ 517-518, 540, 550.)

[3c]/[10c]/[17c]

Ghabra discloses that “[a]fter waiting [for] the fob to awaken, the base station

sends a challenge signal 41 via the base station RF transmitter and antenna.... When the fob is located in the area...the response includes RSSI data showing strong reception. [Otherwise], the RSSI data will reflect a weak signal.” (Ex. 1011, 4:67-5:19.) Ghabra further discloses that “[i]f a fob was awakened in the desired location being polled, a UHF response signal 45 is sent from the fob RF transmitter to the base station RF receiver.” (Ex. 1011, 5:16-19; Ex. 1003, ¶ 519.)



Ex. 1011, Fig. 2 (Annotated)

A POSA would have understood that Ghabra’s disclosure of receiving the response signal 45 after transmitting the UHF challenge signal 44 indicates that the fob was awakened in the proper zone. Accordingly, the combination of Lickfelt and Ghabra teaches “*when a responsive signal is received from the computational device [e.g., response 45], determining, by the device discovery [computer program], that the computational device is attempting to connect to a network and/or communication subsystem of a vehicle.*” (Ex. 1003, ¶¶ 520-523, 541, 551.)

[5a]-[5b]/[12a]-[12b]/[19a]-[19b]

Lickfelt discloses that the ECU 16 unlocks the lock 24 if “the fob located

within the proximal zone 34 [*sic* 32], at 124”; locks the lock 24 if the fob 14 is “within the outer zone 36”; and “keep[s] the door lock 24 in whichever state, locked or unlocked, that the door lock is currently in...when the fob is in the hysteresis zone 34.” (Ex. 1012, [0027], [0023], [0032]; Ex. 1003, ¶¶ 524-530.)

Lickfelt also discloses that the ECU 16 can determine whether to “unlock the door 24 (and perform other vehicle operations)” based on authenticating the fob 14. (Ex. 1012, [0025].) However, Lickfelt does not expressly describe what these “other vehicle operations” are. Ghabra discloses a PEPS system, i.e., a vehicle system that determines the location of a key fob (“localizing a fob”) for passive entry and passive start vehicle functionality. (Ex. 1011, 4:57-63; Ex. 1003, ¶¶ 531-533.)

Thus, a POSA at the time of the invention would have recognized that the combination of Lickfelt and Ghabra teaches “*wherein the device discovery [computer program] determines a set of tasks, functions, and/or operations that can be performed and a set of tasks, functions, and/or operations that cannot be performed based on the determined location of the computational device [e.g. door lock/unlock and engine start].*” (Ex. 1003, ¶¶ 534, 542-544, 552-554.)

VIII. Objective Indicia of Nonobviousness

Petitioner is not aware of any evidence of alleged secondary considerations of non-obviousness having nexus to the challenged claims. (Ex. 1003, ¶ 555.)

IX. Conclusion

For the foregoing reasons, the Board should grant institution.

Respectfully submitted,

Dated: September 11, 2025

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Certificate of Service

The undersigned hereby certifies that the foregoing **CORRECTED PETITION FOR *INTER PARTES* REVIEW UNDER 35 U.S.C. §311 *ET SEQ.* AND 37 C.F.R. §42.100 *ET SEQ.* (U.S. PATENT NO. 9,020,697)**, was served by electronic mail to the attorneys listed below:

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Certificate of Compliance Pursuant to 37 C.F.R. § 42.24

This paper complies with the type-volume limitation of 37 C.F.R. §42.24. The paper contains 13,716 words, excluding the parts of the paper exempted by §42.24(a).

This paper also complies with the typeface requirements of 37 C.F.R. §42.6(a)(ii) and the type style requirements of §42.6(a)(iii)&(iv).

Respectfully submitted,

Dated: September 11, 2025

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Appendix A

A. Listing of All Challenged Claims

1[pre]	A method, comprising:
[1a]	(a) determining, by a microprocessor executable device discovery daemon, that a computational device is connected to or attempting to connect to a network and/or communication subsystem of a vehicle;
[1b]	(b) in response, determining, by the device discovery daemon, whether the computational device is located within a predetermined area and/or zone of the vehicle; and
[1c]	(c) applying, by the device discovery daemon, at least the following rules:
[1d]	(C1) when the computational device is located within the predetermined area and/or zone of the vehicle, permitting the computational device to access or attempt to access the vehicle network and/or communication subsystem; and
[1e]	(C2) when the computational device is not located within the predetermined area and/or zone of the vehicle, not permitting the computational device to access or attempt to access the vehicle network and/or communication subsystem.
[2a]	The method of claim 1, wherein a type of the computational device determines a specific predetermined area and/or zone of the vehicle, from among a plurality of predetermined areas and/or zones, to be used in applying the rules,
[2b]	wherein the computational device is one or more of a tablet computer, laptop, smart phone, and personal digital assistant, and
[2c]	wherein the specific predetermined area and/or zone of the vehicle is

	at least part of the passenger compartment.
3[pre]	The method of claim 1, wherein step (a) comprises the substeps:
[3a]	receiving, by the device discovery daemon, information from an on board vehicle sensor that a new occupant has entered the vehicle;
[3b]	in response to the receipt of the information, emitting, by the device discovery daemon, a ping to discover the computational device; and
[3c]	when a responsive signal is received from the computational device, determining, by the device discovery daemon, that the computational device is attempting to connect to a network and/or communication subsystem of a vehicle.
[4]	The method of claim 1, wherein the determining step (b) bases the determination on whether the computational device is located within the predetermined area and/or zone of the vehicle on one or more of signal strength of a signal from the computational device as received by an access point of the vehicle, a received satellite-based position of the computational device, triangulation based on relative received signal strengths of a signal from the computational device as received by multiple access points of the vehicle, image processing of images of the predetermined area and/or zone, occupant presence and/or location information received by an on board vehicle sensor, whether the computational device is attempting to connect to the network and/or communication subsystem wirelessly or by hard wire connection, whether the computational device has moved relative to

	a selected access point during a defined time interval, whether the received signal strength of signaling from the computational device at a selected access point varies temporally, a type or service of the computational device, and input received from a user of the computational device.
[5a]	The method of claim 4, wherein the wherein the computational device determined to be located within the predetermined area and/or zone of the vehicle and is permitted to access or attempt to access the vehicle network and/or communication subsystem and
[5b]	wherein the device discovery daemon determines a set of tasks, functions, and/or operations that can be performed and a set of tasks, functions, and/or operations that cannot be performed based on the determined location of the computational device.
[6]	The method of claim 4, wherein the device discovery daemon uses multiple of the one or more of signal strength of a signal from the computational device as received by an access point of the vehicle, a received satellite-based position of the computational device, triangulation based on relative received signal strengths of a signal from the computational device as received by multiple access points of the vehicle, image processing of images of the predetermined area and/or zone, occupant presence and/or location information received by an on board vehicle sensor, whether the computational device is attempting to connect to the network and/or communication subsystem wirelessly or by hard wire connection, whether the computational device has moved relative to a selected access point during a defined time interval, whether the received signal strength

	of signaling from the computational device at a selected access point varies temporally, a type or service of the computational device, and input received from a user of the computational device.
[7]	The method of claim 6, wherein the device discovery daemon determines a level of confidence that the computational device is located within the predetermined area and/or zone and wherein the device discovery daemon determines that the computational device is located within the predetermined area and/or zone when the level of confidence has at least a threshold value.
8[pre]	A vehicle, comprising:
[8a]	a microprocessor executable device discovery daemon operable to:
[8b]	(a) determine that a computational device is connected to or attempting to connect to a network and/or communication subsystem of a vehicle;
[8c]	(b) in response, determining whether the computational device is located within a predetermined area and/or zone of the vehicle; and
[8d]	(c) applying at least the following rules:
[8e]	(C1) when the computational device is located within the predetermined area and/or zone of the vehicle, permitting the computational device to access or attempt to access the vehicle network and/or communication subsystem; and
[8f]	(C2) when the computational device is not located within the predetermined area and/or zone of the vehicle, not permitting the computational device to access or attempt to access the vehicle network and/or communication subsystem.

[9a]	The vehicle of claim 8, wherein a type of the computational device determines a specific predetermined area and/or zone of the vehicle, from among a plurality of predetermined areas and/or zones, to be used in applying the rules,
[9b]	wherein the computational device is one or more of a tablet computer, laptop, smart phone, and personal digital assistant, and
[9c]	wherein the specific predetermined area and/or zone of the vehicle is at least part of the passenger compartment.
10[pre]	The vehicle of claim 8, wherein operation (a) comprises the suboperations:
[10a]	receiving, by the device discovery daemon, information from an on board vehicle sensor that a new occupant has entered the vehicle;
[10b]	in response to the receipt of the information, emitting, by the device discovery daemon, a ping to discover the computational device; and
[10c]	when a responsive signal is received from the computational device, determining, by the device discovery daemon, that the computational device is attempting to connect to a network and/or communication subsystem of a vehicle.
[11]	The vehicle of claim 8, wherein the determining operation (b) bases the determination on whether the computational device is located within the predetermined area and/or zone of the vehicle on one or more of signal strength of a signal from the computational device as received by an access point of the vehicle, a received satellite-based position of the computational device, triangulation based on relative received signal strengths of a signal from the computational device as received by multiple access points of the vehicle, image

	processing of images of the predetermined area and/or zone, occupant presence and/or location information received by an on board vehicle sensor, whether the computational device is attempting to connect to the network and/or communication subsystem wirelessly or by hard wire connection, whether the computational device has moved relative to a selected access point during a defined time interval, whether the received signal strength of signaling from the computational device at a selected access point varies temporally, a type or service of the computational device, and input received from a user of the computational device.
[12a]	The vehicle of claim 11, wherein the wherein the computational device determined to be located within the predetermined area and/or zone of the vehicle and is permitted to access or attempt to access the vehicle network and/or communication subsystem and
[12b]	wherein the device discovery daemon determines a set of tasks, functions, and/or operations that can be performed and a set of tasks, functions, and/or operations that cannot be performed based on the determined location of the computational device.
[13]	The vehicle of claim 11, wherein the device discovery daemon uses multiple of the one or more of signal strength of a signal from the computational device as received by an access point of the vehicle, a received satellite-based position of the computational device, triangulation based on relative received signal strengths of a signal from the computational device as received by multiple access points of the vehicle, image processing of images of the predetermined area and/or zone, occupant presence and/or location information received

	by an on board vehicle sensor, whether the computational device is attempting to connect to the network and/or communication subsystem wirelessly or by hard wire connection, whether the computational device has moved relative to a selected access point during a defined time interval, whether the received signal strength of signaling from the computational device at a selected access point varies temporally, a type or service of the computational device, and input received from a user of the computational device.
[14]	The vehicle of claim 13, wherein the device discovery daemon determines a level of confidence that the computational device is located within the predetermined area and/or zone and wherein the device discovery daemon determines that the computational device is located within the predetermined area and/or zone when the level of confidence has at least a threshold value.
15[pre]	A tangible and non-transient computer readable medium including microprocessor executable instructions that, when executed, perform at least the following functions:
[15a]	(a) determining that a computational device is connected to or attempting to connect to a network and/or communication subsystem of a vehicle;
[15b]	(b) in response, determining whether the computational device is located within a predetermined area and/or zone of the vehicle; and
[15c]	(c) applying, by the device discovery daemon, at least the following rules:

[15d]	(C1) when the computational device is located within the predetermined area and/or zone of the vehicle, permitting the computational device to access or attempt to access the vehicle network and/or communication subsystem; and
[15e]	(C2) when the computational device is not located within the predetermined area and/or zone of the vehicle, not permitting the computational device to access or attempt to access the vehicle network and/or communication subsystem.
[16a]	The computer readable medium of claim 15, wherein a type of the computational device determines a specific predetermined area and/or zone of the vehicle, from among a plurality of predetermined areas and/or zones, to be used in applying the rules,
[16b]	wherein the computational device is one or more of a tablet computer, laptop, smart phone, and personal digital assistant, and
[16c]	wherein the specific predetermined area and/or zone of the vehicle is at least part of the passenger compartment.
17[pre]	The computer readable medium of claim 15, wherein function (a) comprises the subfunctions:
[17a]	receiving, by the device discovery daemon, information from an on board vehicle sensor that a new occupant has entered the vehicle;
[17b]	in response to the receipt of the information, emitting, by the device discovery daemon, a ping to discover the computational device; and
[17c]	when a responsive signal is received from the computational device, determining, by the device discovery daemon, that the computational device is attempting to connect to a network and/or communication subsystem of a vehicle.

[18]	The computer readable medium of claim 15, wherein the determining function (b) bases the determination on whether the computational device is located within the predetermined area and/or zone of the vehicle on one or more of signal strength of a signal from the computational device as received by an access point of the vehicle, a received satellite-based position of the computational device, triangulation based on relative received signal strengths of a signal from the computational device as received by multiple access points of the vehicle, image processing of images of the predetermined area and/or zone, occupant presence and/or location information received by an on board vehicle sensor, whether the computational device is attempting to connect to the network and/or communication subsystem wirelessly or by hard wire connection, whether the computational device has moved relative to a selected access point during a defined time interval, whether the received signal strength of signaling from the computational device at a selected access point varies temporally, a type or service of the computational device, and input received from a user of the computational device.
[19a]	The computer readable medium of claim 18, wherein the wherein the computational device determined to be located within the predetermined area and/or zone of the vehicle and is permitted to access or attempt to access the vehicle network and/or communication subsystem and
[19b]	wherein the device discovery daemon determines a set of tasks, functions, and/or operations that can be performed and a set of tasks,

	functions, and/or operations that cannot be performed based on the determined location of the computational device.
[20]	The computer readable medium of claim 18, wherein the device discovery daemon uses multiple of the one or more of signal strength of a signal from the computational device as received by an access point of the vehicle, a received satellite-based position of the computational device, triangulation based on relative received signal strengths of a signal from the computational device as received by multiple access points of the vehicle, image processing of images of the predetermined area and/or zone, occupant presence and/or location information received by an on board vehicle sensor, whether the computational device is attempting to connect to the network and/or communication subsystem wirelessly or by hard wire connection, whether the computational device has moved relative to a selected access point during a defined time interval, whether the received signal strength of signaling from the computational device at a selected access point varies temporally, a type or service of the computational device, and input received from a user of the computational device.
[21]	The computer readable medium of claim 20, wherein the device discovery daemon determines a level of confidence that the computational device is located within the predetermined area and/or zone and wherein the device discovery daemon determines that the computational device is located within the predetermined area and/or zone when the level of confidence has at least a threshold value.

Appendix B

A. Comparison of Independent Claims

Ind. Claim 1	Ind. Claim 8	Ind. Claim 15
1[pre]. A method, comprising:	8[pre]. A vehicle, comprising:	
[1a] (a) determining, by a microprocessor executable device discovery daemon,	[8a] a microprocessor executable device discovery daemon operable to:	15[pre]. A tangible and non-transient computer readable medium including microprocessor executable instructions that, when executed, perform at least the following functions:
that a computational device is connected to or attempting to connect to a network and/or communication subsystem of a vehicle;	[8b] (a) determine that a computational device is connected to or attempting to connect to a network and/or communication subsystem of a vehicle;	[15a] (a) determining that a computational device is connected to or attempting to connect to a network and/or communication subsystem of a vehicle;
[1b] (b) in response, determining, by the device discovery daemon,	[8c] (b) in response, determining	[15b] (b) in response, determining
whether the computational device is located within a predetermined area and/or zone of the vehicle; and	whether the computational device is located within a predetermined area and/or zone of the vehicle; and	whether the computational device is located within a predetermined area and/or zone of the vehicle; and
[1c] (c) applying, by the device discovery daemon, at least the following rules:	[8d] (c) applying at least the following rules:	[15c] (c) applying, by the device discovery daemon, at least the following rules:
[1d] (C1) when the computational device is	[8e] (C1) when the computational device is	[15d] (C1) when the computational device is

located within the predetermined area and/or zone of the vehicle, permitting the computational device to access or attempt to access the vehicle network and/or communication subsystem; and	located within the predetermined area and/or zone of the vehicle, permitting the computational device to access or attempt to access the vehicle network and/or communication subsystem; and	located within the predetermined area and/or zone of the vehicle, permitting the computational device to access or attempt to access the vehicle network and/or communication subsystem; and
[1e] (C2) when the computational device is not located within the predetermined area and/or zone of the vehicle, not permitting the computational device to access or attempt to access the vehicle network and/or communication subsystem.	[8f] (C2) when the computational device is not located within the predetermined area and/or zone of the vehicle, not permitting the computational device to access or attempt to access the vehicle network and/or communication subsystem.	[15e] (C2) when the computational device is not located within the predetermined area and/or zone of the vehicle, not permitting the computational device to access or attempt to access the vehicle network and/or communication subsystem.

B. Comparison of Dependent Claims

Depends from Ind. Claim 1	Depends from Ind. Claim 8	Depends from Ind. Claim 15
[2a] The method of claim 1, wherein a type of the computational device determines a specific predetermined area and/or zone of the vehicle, from among a plurality of predetermined areas	[9a] The vehicle of claim 8, wherein a type of the computational device determines a specific predetermined area and/or zone of the vehicle, from among a plurality of predetermined areas	[16a] The computer readable medium of claim 15, wherein a type of the computational device determines a specific predetermined area and/or zone of the vehicle, from among a plurality of predetermined areas

and/or zones, to be used in applying the rules,	and/or zones, to be used in applying the rules,	and/or zones, to be used in applying the rules,
[2b] wherein the computational device is one or more of a tablet computer, laptop, smart phone, and personal digital assistant, and	[9b] wherein the computational device is one or more of a tablet computer, laptop, smart phone, and personal digital assistant, and	[16b] wherein the computational device is one or more of a tablet computer, laptop, smart phone, and personal digital assistant, and
[2c] wherein the specific predetermined area and/or zone of the vehicle is at least part of the passenger compartment.	[9c] wherein the specific predetermined area and/or zone of the vehicle is at least part of the passenger compartment.	[16c] wherein the specific predetermined area and/or zone of the vehicle is at least part of the passenger compartment.
3[pre]. The method of claim 1, wherein step (a) comprises the substeps:	10[pre]. The vehicle of claim 8, wherein operation (a) comprises the suboperations:	17[pre]. The computer readable medium of claim 15, wherein function (a) comprises the subfunctions:
[3a] receiving, by the device discovery daemon, information from an on board vehicle sensor that a new occupant has entered the vehicle;	[10a] receiving, by the device discovery daemon, information from an on board vehicle sensor that a new occupant has entered the vehicle;	[17a] receiving, by the device discovery daemon, information from an on board vehicle sensor that a new occupant has entered the vehicle;
[3b] in response to the receipt of the information, emitting, by the device discovery daemon, a ping to discover the computational device; and	[10b] in response to the receipt of the information, emitting, by the device discovery daemon, a ping to discover the computational device; and	[17b] in response to the receipt of the information, emitting, by the device discovery daemon, a ping to discover the computational device; and
[3c] when a responsive signal is received from the computational device, determining, by the	[10c] when a responsive signal is received from the computational device, determining, by the	[17c] when a responsive signal is received from the computational device, determining, by the

device discovery daemon, that the computational device is attempting to connect to a network and/or communication subsystem of a vehicle.	device discovery daemon, that the computational device is attempting to connect to a network and/or communication subsystem of a vehicle.	device discovery daemon, that the computational device is attempting to connect to a network and/or communication subsystem of a vehicle.
<p>[4] The method of claim 1, wherein the determining step (b)</p> <p>bases the determination on whether the computational device is located within the predetermined area and/or zone of the vehicle on one or more of signal strength of a signal from the computational device as received by an access point of the vehicle, a received satellite-based position of the computational device, triangulation based on relative received signal strengths of a signal from the computational device as received by multiple access points of the vehicle, image processing of images of the predetermined area and/or zone, occupant presence and/or location information received by an on board vehicle</p>	<p>[11] The vehicle of claim 8, wherein the determining operation (b)</p> <p>bases the determination on whether the computational device is located within the predetermined area and/or zone of the vehicle on one or more of signal strength of a signal from the computational device as received by an access point of the vehicle, a received satellite-based position of the computational device, triangulation based on relative received signal strengths of a signal from the computational device as received by multiple access points of the vehicle, image processing of images of the predetermined area and/or zone, occupant presence and/or location information received by an on board vehicle</p>	<p>[18] The computer readable medium of claim 15, wherein the determining function (b)</p> <p>bases the determination on whether the computational device is located within the predetermined area and/or zone of the vehicle on one or more of signal strength of a signal from the computational device as received by an access point of the vehicle, a received satellite-based position of the computational device, triangulation based on relative received signal strengths of a signal from the computational device as received by multiple access points of the vehicle, image processing of images of the predetermined area and/or zone, occupant presence and/or location information received by an on board vehicle</p>

<p>sensor, whether the computational device is attempting to connect to the network and/or communication subsystem wirelessly or by hard wire connection, whether the computational device has moved relative to a selected access point during a defined time interval, whether the received signal strength of signaling from the computational device at a selected access point varies temporally, a type or service of the computational device, and input received from a user of the computational device.</p>	<p>sensor, whether the computational device is attempting to connect to the network and/or communication subsystem wirelessly or by hard wire connection, whether the computational device has moved relative to a selected access point during a defined time interval, whether the received signal strength of signaling from the computational device at a selected access point varies temporally, a type or service of the computational device, and input received from a user of the computational device.</p>	<p>sensor, whether the computational device is attempting to connect to the network and/or communication subsystem wirelessly or by hard wire connection, whether the computational device has moved relative to a selected access point during a defined time interval, whether the received signal strength of signaling from the computational device at a selected access point varies temporally, a type or service of the computational device, and input received from a user of the computational device.</p>
<p>[5a]. The method of claim 4,</p> <p>wherein the wherein the computational device determined to be located within the predetermined area and/or zone of the vehicle and is permitted to access or attempt to access the vehicle network and/or communication subsystem and</p>	<p>[12a]. The vehicle of claim 11,</p> <p>wherein the wherein the computational device determined to be located within the predetermined area and/or zone of the vehicle and is permitted to access or attempt to access the vehicle network and/or communication subsystem and</p>	<p>[19a]. The computer readable medium of claim 18,</p> <p>wherein the wherein the computational device determined to be located within the predetermined area and/or zone of the vehicle and is permitted to access or attempt to access the vehicle network and/or communication subsystem and</p>

<p>[5b] wherein the device discovery daemon determines a set of tasks, functions, and/or operations that can be performed and a set of tasks, functions, and/or operations that cannot be performed based on the determined location of the computational device.</p>	<p>[12b] wherein the device discovery daemon determines a set of tasks, functions, and/or operations that can be performed and a set of tasks, functions, and/or operations that cannot be performed based on the determined location of the computational device.</p>	<p>[19b] wherein the device discovery daemon determines a set of tasks, functions, and/or operations that can be performed and a set of tasks, functions, and/or operations that cannot be performed based on the determined location of the computational device.</p>
<p>[6] The method of claim 4, wherein the device discovery daemon uses multiple of the one or more of signal strength of a signal from the computational device as received by an access point of the vehicle, a received satellite-based position of the computational device, triangulation based on relative received signal strengths of a signal from the computational device as received by multiple access points of the vehicle, image processing of images of the predetermined area and/or zone, occupant presence and/or location information received by an on board vehicle</p>	<p>[13] The vehicle of claim 11, wherein the device discovery daemon uses multiple of the one or more of signal strength of a signal from the computational device as received by an access point of the vehicle, a received satellite-based position of the computational device, triangulation based on relative received signal strengths of a signal from the computational device as received by multiple access points of the vehicle, image processing of images of the predetermined area and/or zone, occupant presence and/or location information received by an on board vehicle</p>	<p>[20] The computer readable medium of claim 18, wherein the device discovery daemon uses multiple of the one or more of signal strength of a signal from the computational device as received by an access point of the vehicle, a received satellite-based position of the computational device, triangulation based on relative received signal strengths of a signal from the computational device as received by multiple access points of the vehicle, image processing of images of the predetermined area and/or zone, occupant presence and/or location information received by an on board vehicle</p>

<p>sensor, whether the computational device is attempting to connect to the network and/or communication subsystem wirelessly or by hard wire connection, whether the computational device has moved relative to a selected access point during a defined time interval, whether the received signal strength of signaling from the computational device at a selected access point varies temporally, a type or service of the computational device, and input received from a user of the computational device.</p>	<p>sensor, whether the computational device is attempting to connect to the network and/or communication subsystem wirelessly or by hard wire connection, whether the computational device has moved relative to a selected access point during a defined time interval, whether the received signal strength of signaling from the computational device at a selected access point varies temporally, a type or service of the computational device, and input received from a user of the computational device.</p>	<p>sensor, whether the computational device is attempting to connect to the network and/or communication subsystem wirelessly or by hard wire connection, whether the computational device has moved relative to a selected access point during a defined time interval, whether the received signal strength of signaling from the computational device at a selected access point varies temporally, a type or service of the computational device, and input received from a user of the computational device.</p>
<p>[7] The method of claim 6,</p> <p>wherein the device discovery daemon determines a level of confidence that the computational device is located within the predetermined area and/or zone and wherein the device discovery daemon determines that the computational device is located within the</p>	<p>[14] The vehicle of claim 13,</p> <p>wherein the device discovery daemon determines a level of confidence that the computational device is located within the predetermined area and/or zone and wherein the device discovery daemon determines that the computational device is located within the</p>	<p>[21] The computer readable medium of claim 20,</p> <p>wherein the device discovery daemon determines a level of confidence that the computational device is located within the predetermined area and/or zone and wherein the device discovery daemon determines that the computational device is located within the</p>

predetermined area and/or zone when the level of confidence has at least a threshold value.	predetermined area and/or zone when the level of confidence has at least a threshold value.	predetermined area and/or zone when the level of confidence has at least a threshold value.
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