

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                |                        |         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|------------------------|---------|
| <b>Application Data Sheet 37 CFR 1.76</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                | Attorney Docket Number | APIO-ID |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                | Application Number     |         |
| Title of Invention                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | SYSTEM AND METHOD FOR IDENTIFYING VEHICLE BY UTILIZING DETECTED MAGNETIC FIELD |                        |         |
| <p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p> |                                                                                |                        |         |

**Secrecy Order 37 CFR 5.2**

|                          |                                                                                                                                                                                                                                       |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.) |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Inventor Information:**

|                                                                                                                                                                             |            |                    |             |                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------|-------------|-------------------------|
| Inventor 1 <span style="float: right;">Remove</span>                                                                                                                        |            |                    |             |                         |
| Legal Name                                                                                                                                                                  |            |                    |             |                         |
| Prefix                                                                                                                                                                      | Given Name | Middle Name        | Family Name | Suffix                  |
|                                                                                                                                                                             | Sascha     |                    | Simon       |                         |
| Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service    |            |                    |             |                         |
| City                                                                                                                                                                        | Warwick    | State/Province     | NY          | Country of Residence US |
| Mailing Address of Inventor:                                                                                                                                                |            |                    |             |                         |
| Address 1                                                                                                                                                                   |            | 43 Ridgefield Road |             |                         |
| Address 2                                                                                                                                                                   |            |                    |             |                         |
| City                                                                                                                                                                        | Warwick    | State/Province     | NY          |                         |
| Postal Code                                                                                                                                                                 | 10990      | Country            | US          |                         |
| All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button. <span style="float: right;">Add</span> |            |                    |             |                         |

**Correspondence Information:**

|                                                                                                                                       |                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Enter either Customer Number or complete the Correspondence Information section below.<br>For further information see 37 CFR 1.33(a). |                                                                               |
| <input type="checkbox"/> An Address is being provided for the correspondence information of this application.                         |                                                                               |
| Customer Number                                                                                                                       | 54671                                                                         |
| Email Address                                                                                                                         | john@baysidelaw.com <span style="float: right;">Add Email Remove Email</span> |

**Application Information:**

|                                         |                                                                                |                                           |                                     |
|-----------------------------------------|--------------------------------------------------------------------------------|-------------------------------------------|-------------------------------------|
| Title of the Invention                  | SYSTEM AND METHOD FOR IDENTIFYING VEHICLE BY UTILIZING DETECTED MAGNETIC FIELD |                                           |                                     |
| Attorney Docket Number                  | APIO-ID                                                                        | Small Entity Status Claimed               | <input checked="" type="checkbox"/> |
| Application Type                        | Nonprovisional                                                                 |                                           |                                     |
| Subject Matter                          | Utility                                                                        |                                           |                                     |
| Total Number of Drawing Sheets (if any) |                                                                                | Suggested Figure for Publication (if any) | 4                                   |

|                                           |                                                                                |                        |         |
|-------------------------------------------|--------------------------------------------------------------------------------|------------------------|---------|
| <b>Application Data Sheet 37 CFR 1.76</b> |                                                                                | Attorney Docket Number | APIQ-ID |
|                                           |                                                                                | Application Number     |         |
| Title of Invention                        | SYSTEM AND METHOD FOR IDENTIFYING VEHICLE BY UTILIZING DETECTED MAGNETIC FIELD |                        |         |

### Publication Information:

|                          |                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | Request Early Publication (Fee required at time of Request 37 CFR 1.219)                                                                                                                                                                                                                                                                                                                      |
| <input type="checkbox"/> | <b>Request Not to Publish.</b> I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application <b>has not and will not</b> be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing. |

### Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

|                    |                                                  |                                              |                                                         |
|--------------------|--------------------------------------------------|----------------------------------------------|---------------------------------------------------------|
| Please Select One: | <input checked="" type="radio"/> Customer Number | <input type="radio"/> US Patent Practitioner | <input type="radio"/> Limited Recognition (37 CFR 11.9) |
| Customer Number    | 54671                                            |                                              |                                                         |

### Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

|                          |                    |                          |                          |
|--------------------------|--------------------|--------------------------|--------------------------|
| Prior Application Status | Pending            | <a href="#">Remove</a>   |                          |
| Application Number       | Continuity Type    | Prior Application Number | Filing Date (YYYY-MM-DD) |
|                          | non provisional of | 61/740814                | 2012-12-21               |
| Prior Application Status | Pending            | <a href="#">Remove</a>   |                          |
| Application Number       | Continuity Type    | Prior Application Number | Filing Date (YYYY-MM-DD) |
|                          | non provisional of | 61/740831                | 2012-12-21               |
| Prior Application Status | Pending            | <a href="#">Remove</a>   |                          |
| Application Number       | Continuity Type    | Prior Application Number | Filing Date (YYYY-MM-DD) |
|                          | non provisional of | 61/740851                | 2012-12-21               |
| Prior Application Status | Pending            | <a href="#">Remove</a>   |                          |
| Application Number       | Continuity Type    | Prior Application Number | Filing Date (YYYY-MM-DD) |
|                          | non provisional of | 61/745877                | 2012-12-24               |

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.

### Foreign Priority Information:

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                |                          |                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------|------------------------------------------|
| <b>Application Data Sheet 37 CFR 1.76</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                | Attorney Docket Number   | APIO-ID                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                | Application Number       |                                          |
| Title of Invention                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | SYSTEM AND METHOD FOR IDENTIFYING VEHICLE BY UTILIZING DETECTED MAGNETIC FIELD |                          |                                          |
| <p>This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX), the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(n)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).</p> |                                                                                |                          |                                          |
| <a href="#">Remove</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                |                          |                                          |
| Application Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Country <sup>1</sup>                                                           | Filing Date (YYYY-MM-DD) | Access Code <sup>2</sup> (if applicable) |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                |                          |                                          |
| Additional Foreign Priority Data may be generated within this form by selecting the <b>Add</b> button.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                |                          |                                          |

## Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.</p> <p><input type="checkbox"/> NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.</p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Authorization to Permit Access:

|                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Authorization to Permit Access to the Instant Application by the Participating Offices |
|----------------------------------------------------------------------------------------------------------------------------|

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**Application Data Sheet 37 CFR 1.76**

Attorney Docket Number APIO-ID

Application Number

Title of Invention SYSTEM AND METHOD FOR IDENTIFYING VEHICLE BY UTILIZING DETECTED MAGNETIC FIELD

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

**Applicant Information:**

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

**Applicant 1**

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

☐ Assignee☐ Legal Representative under 35 U.S.C. 117☐ Joint Inventor☐ Person to whom the inventor is obligated to assign.☐ Person who shows sufficient proprietary interest

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here ☐

Prefix

Given Name

Middle Name

Family Name

Suffix



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|                                                                                          |                                                                                |                        |         |
|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|------------------------|---------|
| <b>Application Data Sheet 37 CFR 1.76</b>                                                |                                                                                | Attorney Docket Number | APIO-ID |
|                                                                                          |                                                                                | Application Number     |         |
| Title of Invention                                                                       | SYSTEM AND METHOD FOR IDENTIFYING VEHICLE BY UTILIZING DETECTED MAGNETIC FIELD |                        |         |
| <b>Mailing Address Information For Applicant:</b>                                        |                                                                                |                        |         |
| Address 1                                                                                |                                                                                |                        |         |
| Address 2                                                                                |                                                                                |                        |         |
| City                                                                                     |                                                                                | State/Province         |         |
| Country <sup>1</sup>                                                                     |                                                                                | Postal Code            |         |
| Phone Number                                                                             |                                                                                | Fax Number             |         |
| Email Address                                                                            |                                                                                |                        |         |
| Additional Applicant Data may be generated within this form by selecting the Add button. |                                                                                |                        |         |

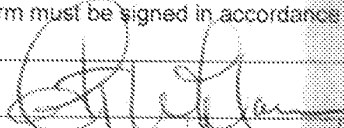
### Assignee Information including Non-Applicant Assignee Information:

|                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                |             |        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------------|-------------|--------|
| Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.                                                                                                                                                                                                                                                                    |            |                |             |        |
| <b>Assignee 1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |                |             |        |
| Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication. |            |                |             |        |
| If the Assignee is an Organization check here: <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                |            |                |             |        |
| Prefix                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Given Name | Middle Name    | Family Name | Suffix |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                |             |        |
| <b>Mailing Address Information For Non-Applicant Assignee:</b>                                                                                                                                                                                                                                                                                                                                                                                         |            |                |             |        |
| Address 1                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |                |             |        |
| Address 2                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |                |             |        |
| City                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            | State/Province |             |        |
| Country <sup>1</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                   |            | Postal Code    |             |        |
| Phone Number                                                                                                                                                                                                                                                                                                                                                                                                                                           |            | Fax Number     |             |        |
| Email Address                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                |             |        |
| Additional Assignee Data may be generated within this form by selecting the Add button.                                                                                                                                                                                                                                                                                                                                                                |            |                |             |        |

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|                                           |                                                                                |                        |         |
|-------------------------------------------|--------------------------------------------------------------------------------|------------------------|---------|
| <b>Application Data Sheet 37 CFR 1.76</b> |                                                                                | Attorney Docket Number | APIO-ID |
|                                           |                                                                                | Application Number     |         |
| Title of Invention                        | SYSTEM AND METHOD FOR IDENTIFYING VEHICLE BY UTILIZING DETECTED MAGNETIC FIELD |                        |         |

**Signature:**

|                                                                                                                              |                                                                                   |                     |                   |
|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------|-------------------|
| NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. |                                                                                   |                     |                   |
| Signature                                                                                                                    |  |                     | Date (YYYY-MM-DD) |
| First Name                                                                                                                   | John                                                                              | Last Name           | Whelan            |
|                                                                                                                              |                                                                                   | Registration Number | 32448             |
| Additional Signature may be generated within this form by selecting the Add button.                                          |                                                                                   |                     |                   |

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

## Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

# DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

|                       |                                                                                   |
|-----------------------|-----------------------------------------------------------------------------------|
| Title of<br>Invention | SYSTEM AND METHOD FOR IDENTIFYING VEHICLE BY UTILIZING DETECTED<br>MAGNETIC FIELD |
|-----------------------|-----------------------------------------------------------------------------------|

As the below named inventor, I hereby declare that:

This declaration is directed to: ☒ The attached application, or  
☐ United States application or PCT international application number \_\_\_\_\_  
 filed on \_\_\_\_\_

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

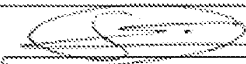
I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

## WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identify theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

## LEGAL NAME OF INVENTOR

Inventor: Sascha Simon Date (Optional): \_\_\_\_\_

Signature:  \_\_\_\_\_

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

FIG. 1A

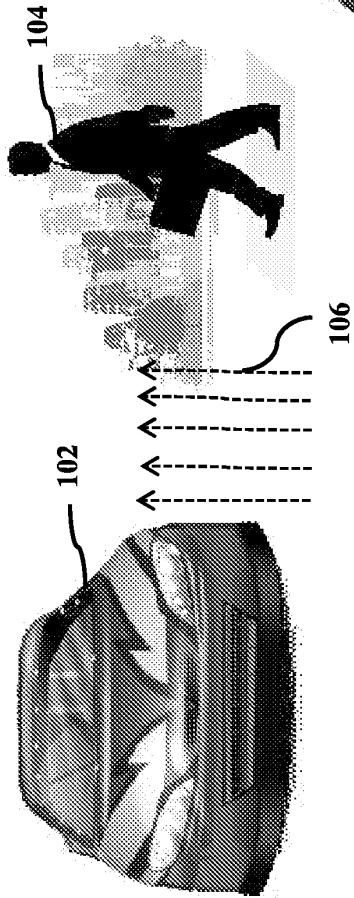


FIG. 1B

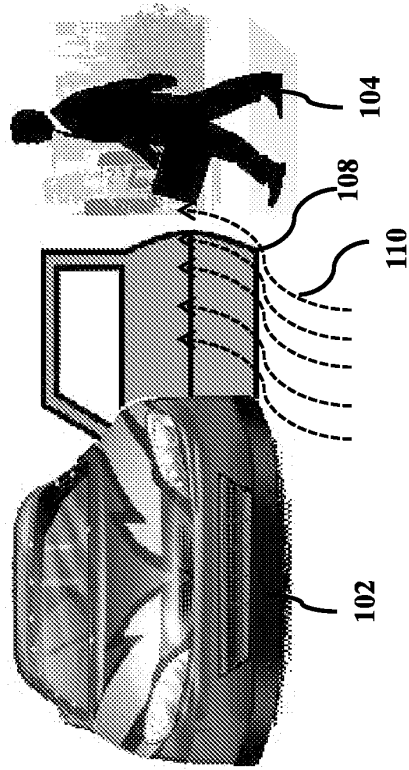


FIG. 1C

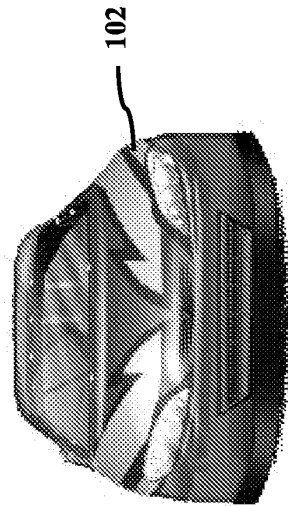


FIG. 2A

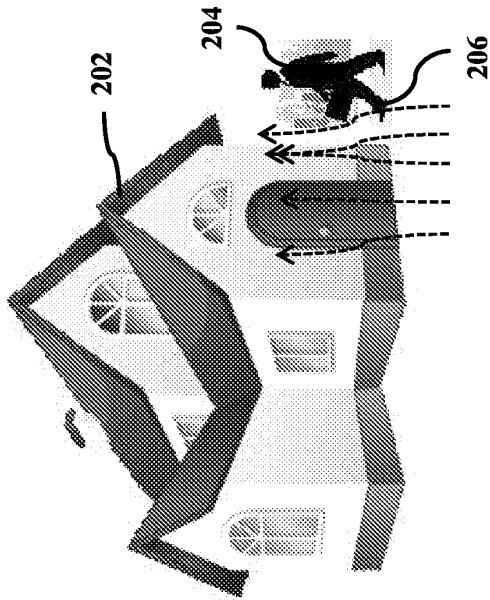


FIG. 2B

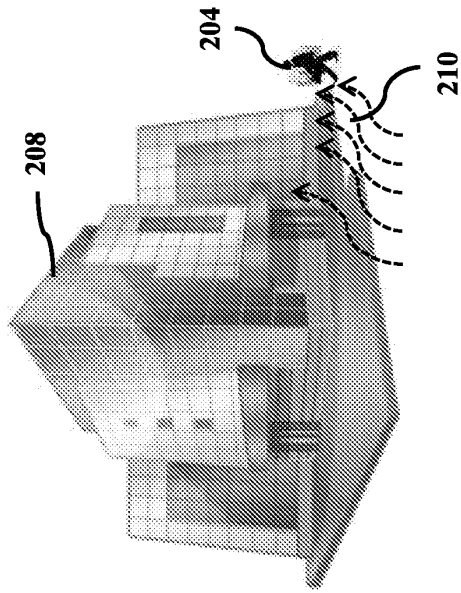


FIG. 3

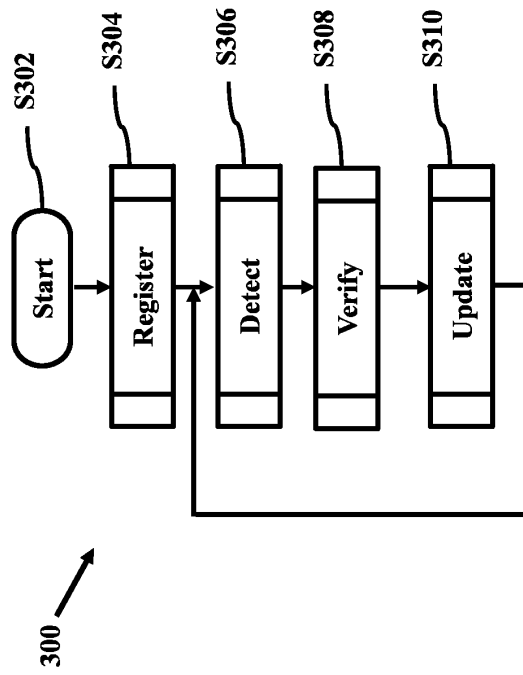


FIG. 5

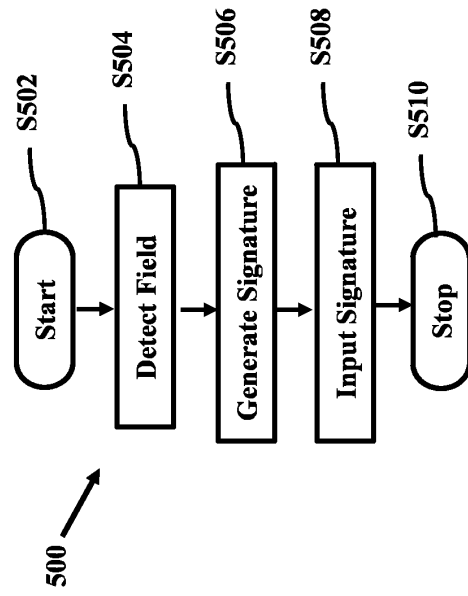




**FIG. 4**

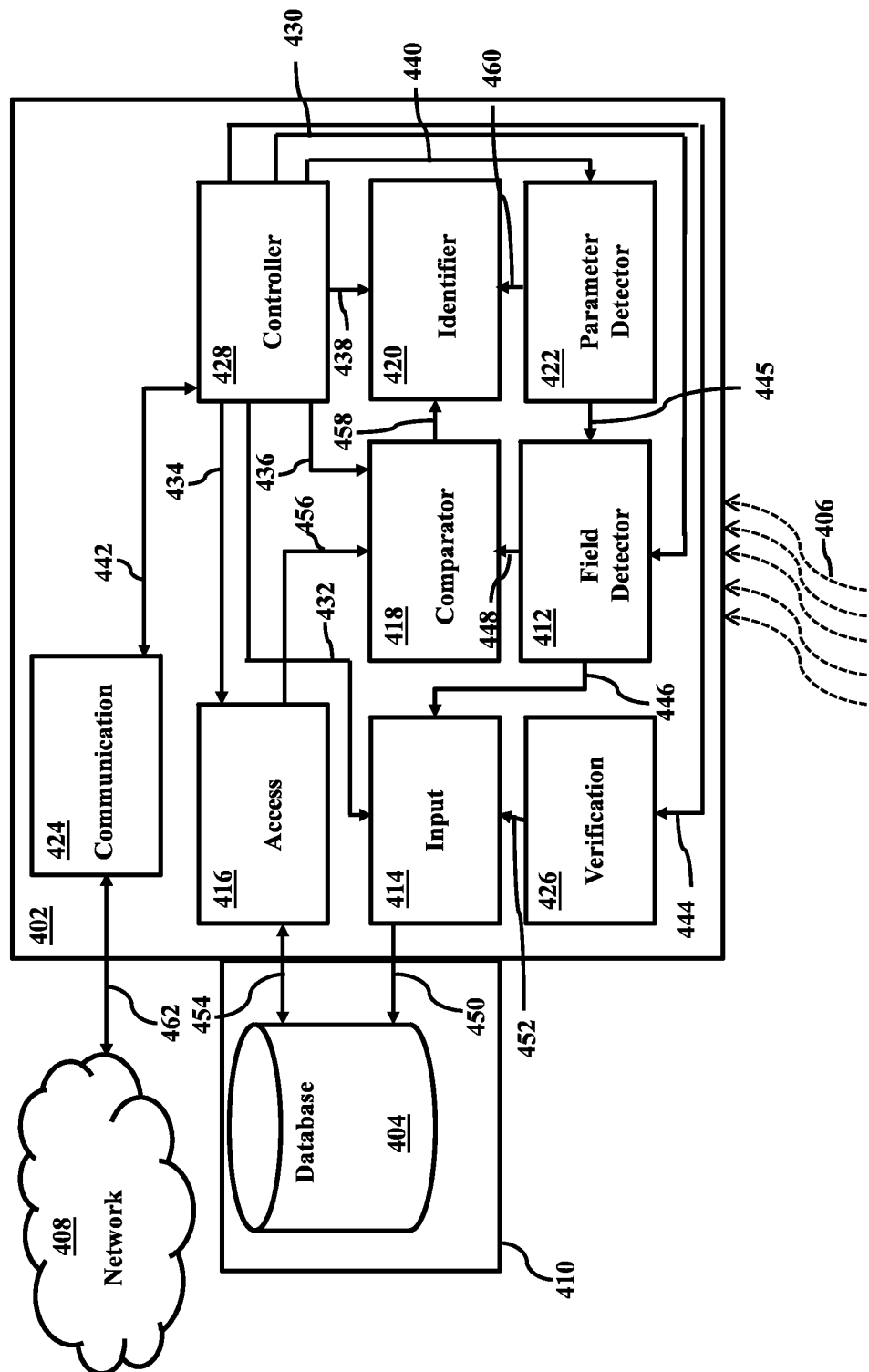


FIG. 6

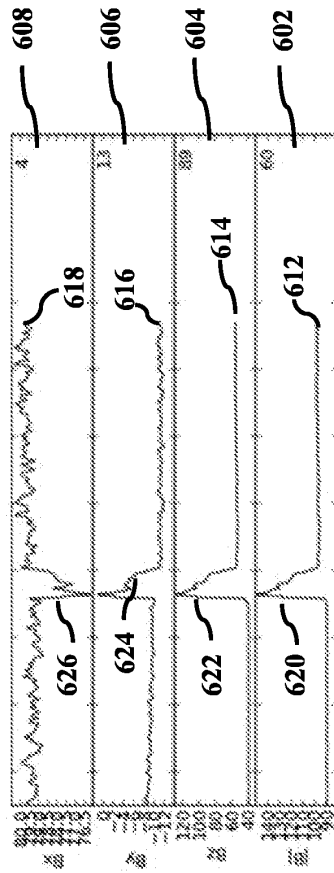


FIG. 7

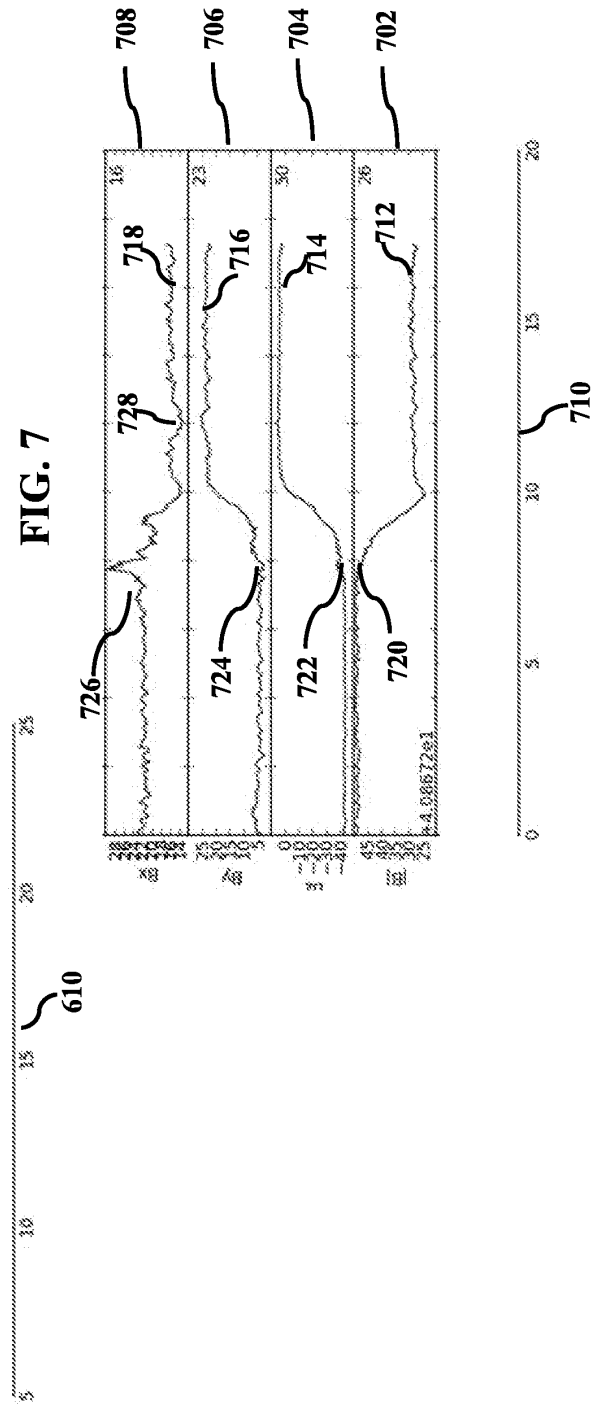


FIG. 8

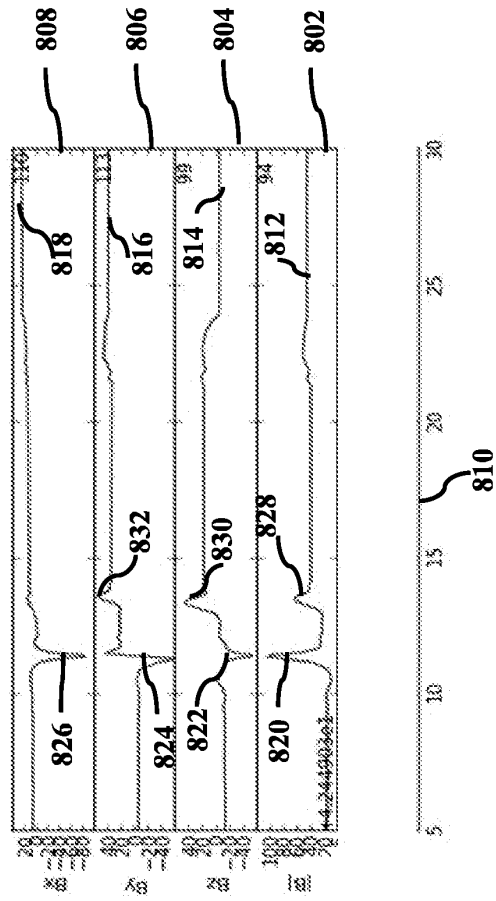


FIG. 9

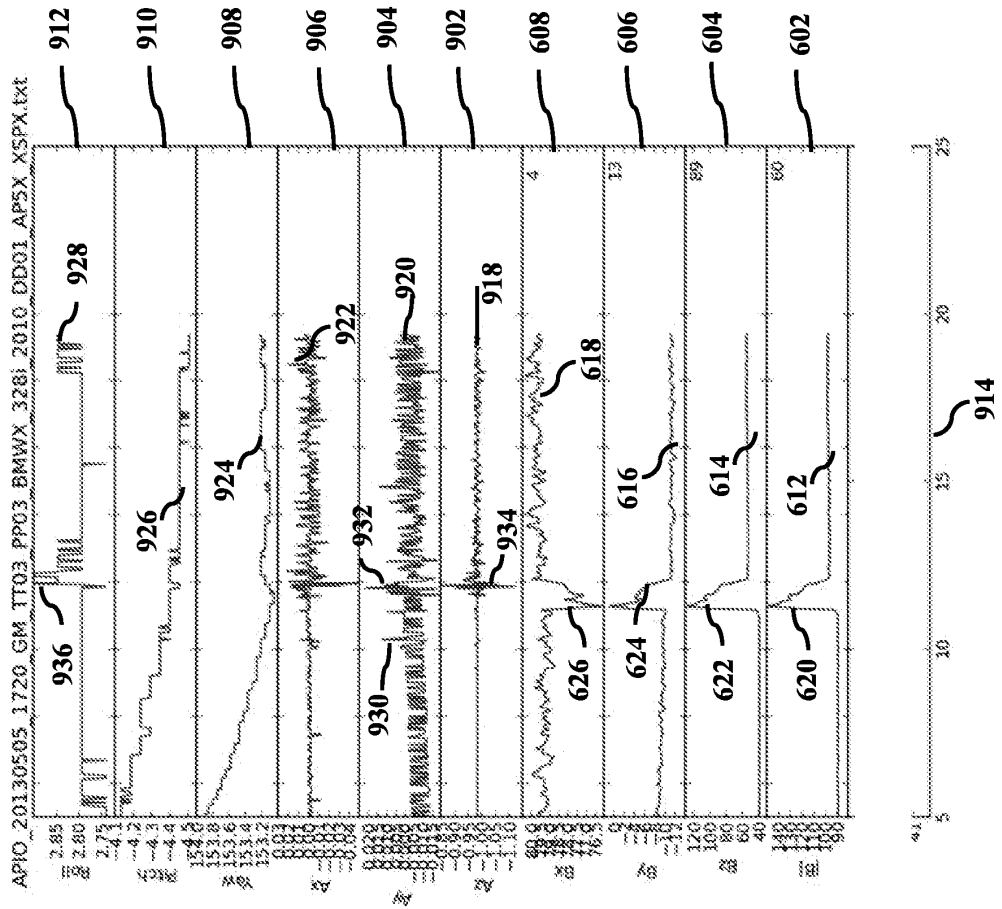


FIG. 10

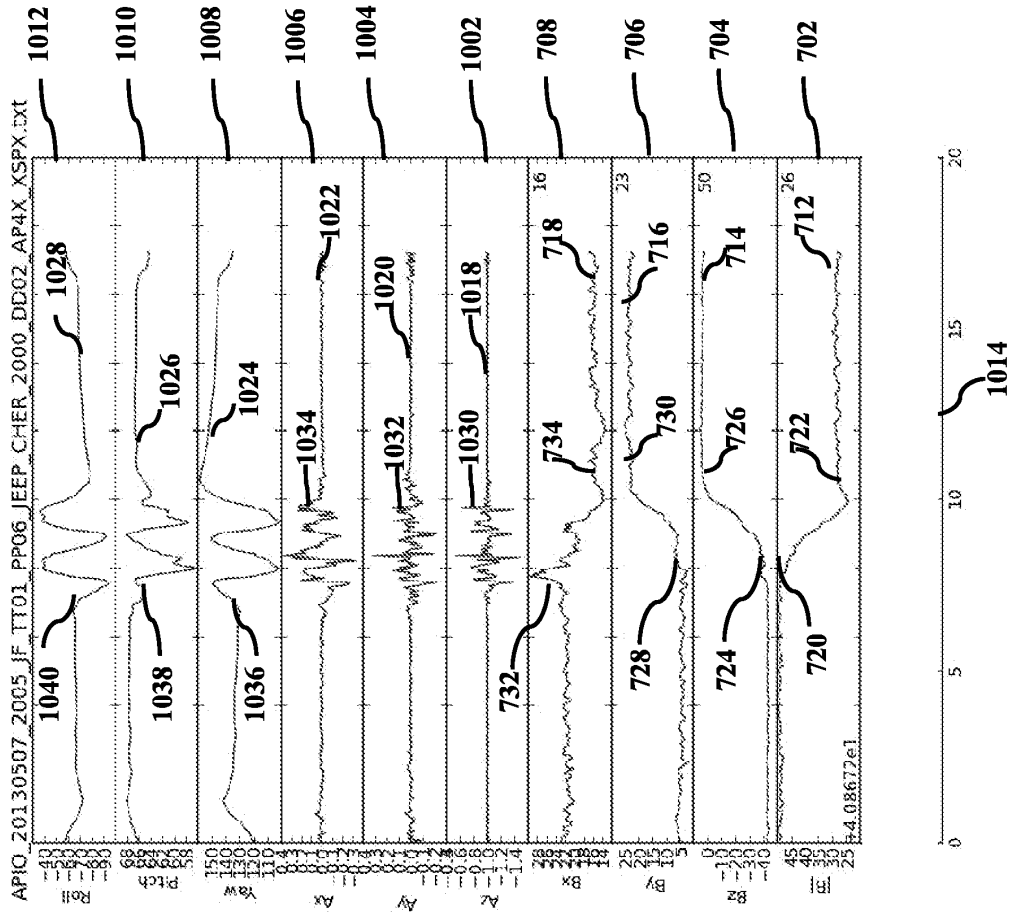


FIG. 11

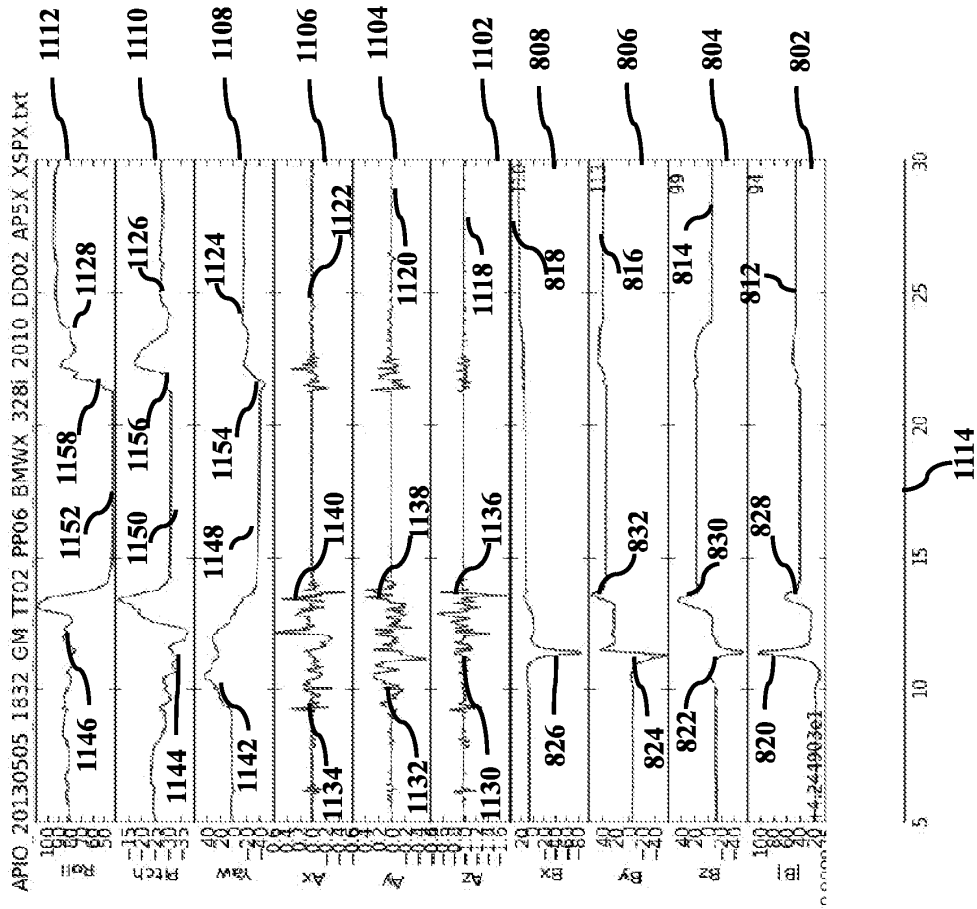


FIG. 12

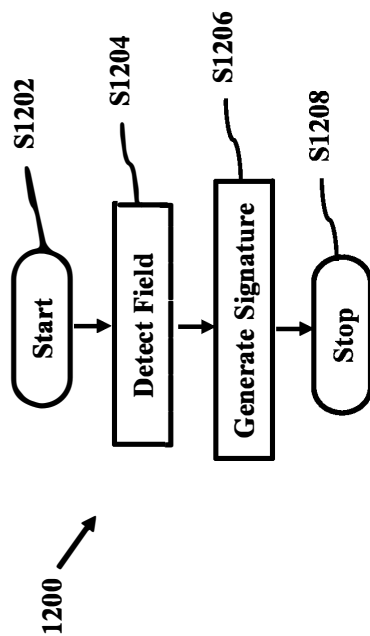
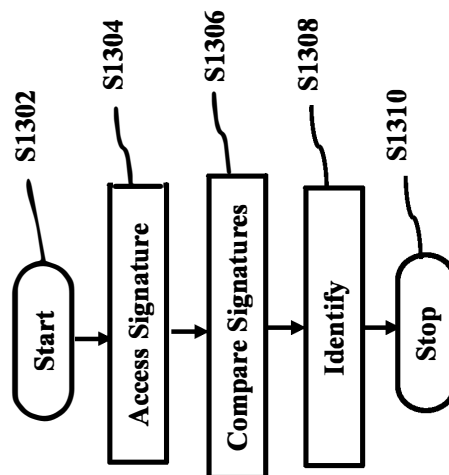


FIG. 13



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION FOR U.S. LETTERS PATENT

Title:

SYSTEM AND METHOD FOR IDENTIFYING VEHICLE BY UTILIZING  
DETECTED MAGNETIC FIELD

Inventor:

Sascha Simon



[0001] The present application claims priority from: U.S. Provisional Application No. 61/740,814 filed December 21, 2012; U.S. Provisional Application No. 61/740,831 filed December 21, 2012; U.S. Provisional Application No. 61/740,851 filed December 21, 2012; and U.S. Provisional Application No. 61/745,677 filed December 24, 2012, the entire disclosures of which are incorporated herein by reference.

## **BACKGROUND**

[0002] Vehicle telematics is the technology of sending, receiving and storing information to and from vehicles and is generally present (at least to a limited extent) in the automotive marketplace today. For example, both General Motors (through their OnStar offering) and Mercedes Benz (through their Tele-Aid and more recent mbrace system offering) have long offered connected-vehicle functionality to their customers. Both of these offerings make use of the data available on a vehicle's CAN bus, which is specified in the OBD-II vehicle diagnostics standard. For example, the deployment of an airbag, which suggests that the vehicle has been involved in a crash, may be detected by monitoring the CAN bus. In this event, a digital wireless telephony module that is embedded in the vehicle and connected to the vehicle's audio system (i.e., having voice connectivity) can initiate a phone call to a telematics service provider (TSP) to "report" the crash. Vehicle location may also be provided to the TSP using the vehicle's GPS functionality. Once the call is established, the TSP representative may attempt to communicate with the vehicle driver, using the vehicle's audio system, to assess the severity of the situation. Assistance may thus be dispatched by the TSP representative to the vehicle as appropriate.

[0003] Historically, these services were focused entirely on driver and passenger safety. These types of services have expanded since their initial roll-out, however, and now offer additional features to the driver, such as concierge services. The services, however, remain mainly focused on voice based driver to call center communication, with data services being only slowly introduced, hindered by low bandwidth communication modules, high cost and only partial availability on some model lines.

[0004] As a result, while generally functional, vehicle telematics services have experienced only limited commercial acceptance in the marketplace. There are several reasons for this. In addition to low speeds and bandwidth, most vehicle drivers (perhaps excluding the premium automotive market niche) are reluctant to pay extra for vehicle

telematics services, either in the form of an upfront payment (i.e., more expensive vehicle) or a recurring (monthly/yearly) service fee. Moreover, from the vehicle manufacturer's perspective, the services require additional hardware to be embedded into the vehicle, resulting in extra costs on the order of \$250 to \$350 or more per vehicle which cannot be recouped. Thus, manufacturers have been slow to fully commit to or invest in the provision of vehicle telematics equipment in all vehicles.

[0005] There have been rudimentary attempts in the past to determine when a smartphone is in a moving vehicle. Wireless service provider AT&T, Sprint and Verizon, for example, offer a smartphone application that reacts in a specific manner to incoming text messages and voice calls when a phone is in what AT&T calls DriveMode™. With the AT&T DriveMode application, a wireless telephone is considered to be in “drive mode” when one of two conditions are met. First, the smartphone operator can manually turn on the application, i.e., she “tells” the application to enter drive mode. Alternatively, when the DriveMode application is in automatic on/off mode and the smartphone GPS sensor senses that the smartphone is travelling at greater than 25 miles per hour, the GPS sensor so informs the DriveMode application, the DriveMode application concludes that the smartphone is in a moving vehicle, and drive mode is entered.

[0006] Both of these paths to engaging the AT&T DriveMode application – the “manual” approach to entering drive mode and the “automatic” approach to entering drive mode -- are problematic. First, if the smartphone operator forgets or simply chooses not to launch the DriveMode application prior to driving the vehicle when the application is in manual mode then the application will not launch. Second, in automatic on/off mode AT&T's use of only the GPS sensor to determine when a smartphone is in a moving vehicle is problematic for a number of reasons. First, the speed threshold of the application is arbitrary, meaning that drive mode will not be detected/engaged at less than 25 mph. If the vehicle is stopped in traffic or at a traffic signal, for example, then the DriveMode application may inadvertently terminate. Second, and perhaps more importantly, AT&T's DriveMode application requires that the smartphone's GPS functionality be turned on at all times. Because the use of a smartphone's GPS sensor is extremely demanding to the battery resources of a smartphone, this requirement severely undermines the usefulness of AT&T's application. Thirdly this method does not differentiate between the type of vehicle that the phone is in, e.g. a bus, a taxi or a train and therefore allows no correlation between the owner of the phone and her

driving situation. For the classic embedded telematics devices to be replaced by smartphones it is important to correlate the driver and smartphone owner with her personal vehicle. Only then the smartphone can truly take the functional role of an embedded telematics device in a vehicle.

[0007] Accordingly, for at least the foregoing reasons there exists a need and it is an object of the present invention to provide an improved method and apparatus of determining the specific identity and type of vehicle a smartphone is in.

### **SUMMARY**

[0008] The present invention provides an improved method and apparatus of determining the specific identity and type of vehicle a smartphone is in.

[0009] Various embodiments described herein are drawn to a device, for use with a database. The device includes a field-detecting component, an input component, an accessing component, a comparing component and an identifying component. The field-detecting component can detect at least one of an electric field, a magnetic field and an electro-magnetic field and can generate a detected field signature based on the detected one of an electric field, a magnetic field and an electro-magnetic field. The input component can input the detected field signature into the database. The accessing component can access the detected field signature from the database. The comparing component can generate a comparison signal. The identifying component can identify one of an item and a location based on the comparison signal. The field-detecting component can further detect a second one of an electric field, a magnetic field and an electro-magnetic field and can generate a second detected field signature based on the detected second one of an electric field, a magnetic field and an electro-magnetic field. The comparing component can generate the comparison signal based on a comparison of the detected field signature and the second detected field signature.

### **BRIEF SUMMARY OF THE DRAWINGS**

[0010] The accompanying drawings, which are incorporated in and form a part of the specification, illustrate an exemplary embodiment of the present invention and, together with the description, serve to explain the principles of the invention. In the drawings:

[0011] **FIGs. 1A-C** illustrate a person and a vehicle at times  $t_1$ ,  $t_2$  and  $t_3$ , respectively;

**[0012] FIGs. 2A-B** illustrate a house and a building, respectively;

**[0013] FIG. 4** illustrates an example method of identifying an item or a location in accordance with aspects of the present invention;

**[0014] FIG. 5** illustrates an example device for identifying an item or a location in accordance with aspects of the present invention;

**[0015] FIG. 6** illustrates an example method of registering an item or a location in accordance with aspects of the present invention;

**[0016] FIG. 7** illustrates an example of measured magnetic fields associated with a vehicle in accordance with aspects of the present invention;

**[0017] FIG. 8** illustrates another example of measured magnetic fields associated with a vehicle in accordance with aspects of the present invention;

**[0018] FIG. 9** illustrates another example of measured magnetic fields associated with a vehicle in accordance with aspects of the present invention;

**[0019] FIG. 10** illustrates an example of measured magnetic fields and of measured acceleration associated with a vehicle in accordance with aspects of the present invention;

**[0020] FIG. 11** illustrates another example of measured magnetic fields and of measured acceleration associated with a vehicle in accordance with aspects of the present invention;

**[0021] FIG. 12** illustrates another example of measured magnetic fields and of measured acceleration associated with a vehicle in accordance with aspects of the present invention;

**[0022] FIG. 12** illustrates an example method of detecting an item or a location in accordance with aspects of the present invention; and

**[0023] FIG. 14** illustrates an example method of verifying an item or a location in accordance with aspects of the present invention.

### DETAILED DESCRIPTION

[0024] Aspects of the present invention are drawn to a system and method for determining a specific item and/or location by utilizing field properties within and/or near the specific item and or location.

[0025] As used herein, the term "smartphone" includes cellular and/or satellite radiotelephone(s) with or without a display (text/graphical); Personal Communications System (PCS) terminal(s) that may combine a radiotelephone with data processing, facsimile and/or data communications capabilities; Personal Digital Assistant(s) (PDA) or other devices that can include a radio frequency transceiver and a pager, Internet/Intranet access, Web browser, organizer, calendar and/or a global positioning system (GPS) receiver; and/or conventional laptop (notebook) and/or palmtop (netbook) computer(s), tablet(s), or other appliance(s), which include a radio frequency transceiver. As used herein, the term "smartphone " also includes any other radiating user device that may have time-varying or fixed geographic coordinates and/or may be portable, transportable, installed in a vehicle (aeronautical, maritime, or land-based) and/or situated and/or configured to operate locally and/or in a distributed fashion over one or more location(s).

[0026] In one non-limiting example embodiment, a smartphone is used to measure a magnetic field associated with a vehicle to identify the vehicle. In another non-limiting example embodiment, a smartphone is used to measure a magnetic field associated with a house to identify the location of the user of the smartphone. These aspects will now be described in more detail with reference to **FIGs. 1A-2B**.

[0027] As shown in **FIG. 1A**, at time  $t_1$ , a magnetic field **106** is located near vehicle **102**. For purposes of discussion, person **104** is holding a device (not shown) in accordance with an aspect of the present invention. In this specific example, the device in accordance with an aspect of the present invention is embodied in a smartphone. In this specific example, the smartphone is able to detect magnetic field **106**.

[0028] As shown in **FIG. 1B**, at time  $t_2$ , the opening of door **108** affects the magnetic field located near vehicle **102**, as shown by field lines **110**. Again the smartphone is able to detect magnetic field shown by field lines **110**.

[0029] As shown in **FIG. 1C**, at time  $t_3$ , the smartphone is not detecting the magnetic field outside of vehicle **102**.

[0030] In accordance with example aspects of the present invention, a smartphone carried by person **104** may identify vehicle **102** by aspects of magnetic field **102** or magnetic field **108**. Non-limiting detectable aspects of the magnetic fields include an instantaneous magnitude, an instantaneous field vector, a magnitude as a function over a period of time, a field vector as a function over a period of time and combinations thereof.

[0031] In accordance with other example aspects of the present invention, a smartphone carried by person **104** may identify vehicle **102** by aspects of a change of magnetic field **102** to magnetic field **108**. Non-limiting detectable aspects of the change magnetic fields include an instantaneous change in magnitude, an instantaneous change in field vector, a change in magnitude as a function over a period of time, a change in field vector as a function over a period of time and combinations thereof.

[0032] In addition to identifying an item, as discussed above with reference to **FIGs. 1A-1C**, aspects of the present invention may be used to identify a location.

[0033] As shown in **FIG. 2A**, at time  $t_4$ , a person **204** is entering a house **202**. A magnetic field **206** is located near house **202**. For purposes of discussion, person **204** is holding a device (not shown) in accordance with an aspect of the present invention. In this specific example, the device in accordance with an aspect of the present invention is embodied in a smartphone. In this specific example, the smartphone is able to detect magnetic field **106**.

[0034] As shown in **FIG. 2B**, at time  $t_5$ , person **204** is entering a building **208**. A magnetic field **210** is located near building **208**. Again the smartphone is able to detect magnetic field **210**.

[0035] In accordance with example aspects of the present invention, a smartphone carried by person **104** may identify whether person **204** is entering house **202** or building **208** by aspects of magnetic field **206** or magnetic field **210**.

[0036] A more detailed discussion of example working embodiment will now be discussed with additional reference to **FIGs. 3-13**.

[0037] **FIG. 3** illustrates an example method **300** of identifying an item or a location in accordance with aspects of the present invention.

[0038] Method **300** starts (**S302**) and an item or location is registered (**S304**). For example, if a person would like to be able to identify their vehicle, the vehicle would be registered based on a field associated with the vehicle, whereas if a person would like to be able to identify a location such as their place of work, then the location would be registered based on a field associated with the vehicle. A more detailed discussion of registration will now be provided with additional reference to **FIGs. 4-11**.

[0039] **FIG. 4** illustrates an example device **402** for identifying an item or a location in accordance with aspects of the present invention.

[0040] **FIG. 4** includes a device **402**, a database **404**, a field **406** and a network **408**. In this example embodiment, device **402** and database **404** are distinct elements. However, in some embodiments, device **402** and database **404** may be a unitary device as indicated by dotted line **410**.

[0041] Device **402** includes a field-detecting component **412**, an input component **414**, an accessing component **416**, a comparing component **418**, an identifying component **420**, a parameter-detecting component **422**, a communication component **424**, a verification component **426** and a controlling component **428**.

[0042] In this example, field-detecting component **412**, input component **414**, accessing component **416**, comparing component **418**, identifying component **420**, parameter-detecting component **422**, communication component **424**, verification component **426** and controlling component **428** are illustrated as individual devices. However, in some embodiments, at least two of field-detecting component **412**, input component **414**, accessing component **416**, comparing component **418**, identifying component **420**, parameter-detecting component **422**, communication component **424**, verification component **426** and controlling component **428** may be combined as a unitary device. Further, in some embodiments, at least one of field-detecting component **412**, input component **414**, accessing component **416**, comparing component **418**, identifying component **420**, parameter-detecting component **422**, communication component **424**, verification component **426** and controlling component **428** may be implemented as a computer having tangible computer-readable media for carrying or

having computer-executable instructions or data structures stored thereon. Such tangible computer-readable media can be any available media that can be accessed by a general purpose or special purpose computer. Non-limiting examples of tangible computer-readable media include physical storage and/or memory media such as RAM, ROM, EEPROM, CD-ROM or other optical disk storage, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to carry or store desired program code means in the form of computer-executable instructions or data structures and which can be accessed by a general purpose or special purpose computer. For information transferred or provided over a network or another communications connection (either hardwired, wireless, or a combination of hardwired or wireless) to a computer, the computer may properly view the connection as a computer-readable medium. Thus, any such connection may be properly termed a computer-readable medium. Combinations of the above should also be included within the scope of computer-readable media.

[0043] Controlling component 428 is arranged to communicate with: field-detecting component 412 via a communication line 430; input component 414 via a communication line 432; accessing component 416 via a communication line 434; comparing component 418 via a communication line 436; identifying component 420 via a communication line 438; parameter-detecting component 422 via a communication line 440; communication component 424 via a communication line 442; and verification component 426 via a communication line 444. Controlling component 428 is operable to control each of field-detecting component 412, input component 414, accessing component 416, comparing component 418, identifying component 420, parameter-detecting component 422, communication component 424 and verification component 426.

[0044] Field-detecting component 412 is additionally arranged to detect field 406, to communicate with input component 414 via a communication line 446, to communicate with comparing component 418 via a communication line 448 and to communicate with parameter-detecting component 422 via a communication line 445. Field-detecting component 412 may be any known device or system that is operable to detect a field, non-limiting examples of which include an electric field, a magnetic field, and electro-magnetic field and combinations thereof. In some non-limiting example embodiments, field-detecting component 412 may detect the amplitude of a field at an instant of time. In some non-limiting example embodiments, field-detecting component 412 may detect a field vector at an



instant of time. In some non-limiting example embodiments, field-detecting component **412** may detect the amplitude of a field as a function over a period of time. In some non-limiting example embodiments, field-detecting component **412** may detect a field vector as a function over a period of time. In some non-limiting example embodiments, field-detecting component **412** may detect a change in the amplitude of a field as a function over a period of time. In some non-limiting example embodiments, field-detecting component **412** may detect a change in a field vector as a function over a period of time.

[0045] Input component **414** is additionally arranged to communicate with database **404** via a communication line **450** and to communicate with verification component **426** via a communication line **452**. Input component **414** may be any known device or system that is operable to input data into database **404**. Non-limiting examples of input component **414** include a graphic user interface (GUI) having a user interactive touch screen or keypad.

[0046] Accessing component **416** is additionally arranged to communicate with database **404** via a communication line **454** and to communicate with comparing component **418** via a communication line **456**. Accessing component **416** may be any known device or system that access data from database **404**.

[0047] Comparing component **418** is additionally arranged to communicate with identifying component **420** via a communication line **458**. Comparing component **418** may be any known device or system that is operable to compare two inputs.

[0048] Parameter-detecting component **422** is additionally arranged to communicate with identifying component **422** via a communication line **460**. Parameter-detecting component **422** may be any known device or system that is operable to detect a parameter, non-limiting examples of which include velocity, acceleration, angular velocity, angular acceleration, geodetic position, sound, temperature, vibrations, pressure, biometrics, contents of surrounding atmosphere and combinations thereof. In some non-limiting example embodiments, parameter-detecting component **422** may detect the amplitude of a parameter at an instant of time. In some non-limiting example embodiments, parameter-detecting component **422** may detect a parameter vector at an instant of time. In some non-limiting example embodiments, parameter-detecting component **422** may detect the amplitude of a parameter as a function over a period of time. In some non-limiting example embodiments, parameter-detecting component **422** may detect a parameter vector as a function over a

period of time. In some non-limiting example embodiments, parameter-detecting component 422 may detect a change in the amplitude of a parameter as a function over a period of time. In some non-limiting example embodiments, parameter-detecting component 422 may detect a change in a parameter vector as a function over a period of time.

[0049] Communication component 424 is additionally arranged to communicate with network 408 via a communication line 462. Communication component 424 may be any known device or system that is operable to communicate with network 408. Non-limiting examples of communication component include a wired and a wireless transmitter/receiver.

[0050] Verification component 426 may be any known device or system that is operable to provide a request for verification. Non-limiting examples of verification component 426 include a graphic user interface having a user interactive touch screen or keypad.

[0051] Communication lines 430, 432, 434, 436, 438, 440, 442, 444, 445, 446, 448, 450, 452, 454, 456, 458, 460 and 462 may be any known wired or wireless communication line.

[0052] Database 404 may be any known device or system that is operable to receive, store, organize and provide (upon a request) data, wherein the “database” refers to the data itself and supporting data structures. Non-limiting examples of database 404 include a memory hard-drive and a semiconductor memory.

[0053] Network 408 may be any known linkage of two or more communication devices. Non-limiting examples of database 408 include a wide-area network, a local-area network and the Internet.

[0054] For purposes of discussion, consider the example where a person is registering their vehicle. In some example embodiments, the vehicle may be registered based on an approach and entry into the vehicle as discussed above with reference to **FIGs. 1A-C**. In some example embodiments, the vehicle may be registered based upon fields detected while the person using the device is within the vehicle. For purposes of discussion, consider the example where a person is registering their vehicle while sitting in the vehicle. In some example embodiments, the registration may be performed based upon fields detected while the vehicle is in a specific mode of operation, non-limiting examples of which include starting up, driving forward, driving in reverse, stopped, accelerating, decelerating and combinations thereof. For purposes of discussion, consider the following example where a

person is registering their vehicle based on the starting up of the vehicle. This example will now be described with additional reference to **FIG. 5**.

[0055] **FIG. 5** illustrates an example method **500** of registering an item or a location in accordance with aspects of the present invention.

[0056] Method **500** starts (**S502**) and a field is detected (**S504**). For example, returning to **FIG. 4**, field-detecting component **412** detects field **406**. For purposes of discussion, let field **406** be a magnetic field corresponding to the superposition of magnetic fields generated by all electronic and mechanical systems involved with the ignition of the vehicle. Some example detected field will now be described with greater detail with reference to **FIGs. 6-8**.

[0057] **FIG. 6** illustrates an example of measured magnetic fields associated with a specific vehicle in accordance with aspects of the present invention.

[0058] **FIG. 6** includes a graph **602**, a graph **604**, a graph **606** and a graph **608**, each of which share a common x-axis **610** in units of seconds. Graph **602** has a y-axis in units of  $\mu\text{T}$  and includes a function **612**. Graph **604** has a y-axis in units of  $\mu\text{T}$  and includes a function **614**. Graph **606** has a y-axis in units of  $\mu\text{T}$  and includes a function **616**. Graph **608** has a y-axis in units of  $\mu\text{T}$  and includes a function **618**.

[0059] Function **612** corresponds to the absolute value of the magnitude of a magnetic field vector (**B**) of the vehicle. Function **614** corresponds to the magnitude of **B** in a z-direction relative to field-detecting component **412**. Function **616** corresponds to the magnitude of **B** in a y-direction relative to field-detecting component **412**. Function **618** corresponds to the magnitude of **B** in an x-direction relative to field-detecting component **412**.

[0060] A sudden change in the magnetic field manifests as spike **620** in function **612**, as spike **622** in function **614**, as spike **624** in function **616** and as spike **626** in function **618**. This spike may be indicative of an event. For purposes of discussion, let this sudden change in the magnetic field correspond to the ignition of a particular vehicle. In this example therefore, the vehicle may have a signature based on functions **612**, **614**, **616** and **618**, having tell-tail spikes **620**, **622**, **624** and **626**, respectively. These functions may be easily distinguished from signatures based on different events, as will now be described with reference to **FIG. 7**.

[0061] **FIG. 7** illustrates another example of measured magnetic fields associated with a second vehicle in accordance with aspects of the present invention.

[0062] **FIG. 7** includes a graph **702**, a graph **704**, a graph **706** and a graph **708**, each of which share a common x-axis **710** in units of seconds. Graph **702** has a y-axis in units of  $\mu\text{T}$  and includes a function **712**. Graph **704** has a y-axis in units of  $\mu\text{T}$  and includes a function **714**. Graph **706** has a y-axis in units of  $\mu\text{T}$  and includes a function **716**. Graph **708** has a y-axis in units of  $\mu\text{T}$  and includes a function **718**.

[0063] Function **712** corresponds to the absolute value of the magnitude of a **B** of the second vehicle. Function **714** corresponds to the magnitude of **B** in a z-direction relative to field-detecting component **412**. Function **716** corresponds to the magnitude of **B** in a y-direction relative to field-detecting component **412**. Function **718** corresponds to the magnitude of **B** in an x-direction relative to field-detecting component **412**.

[0064] By comparing the overall magnitudes of the detected magnetic fields between **FIG. 6** and **FIG. 7** it is clear that the fields are associated with two different vehicles. However, there are additional differences between the detected fields worth noting. A change in the magnetic field of **FIG. 7** manifests as a curve **720** in function **712**, as a curve **722** in function **714**, as a curve **724** in function **716** and as a spike **726** in function **718**. A commonality of each of these features is a rotation of the magnetic field, which may be indicative of an event. In this example, the relatively smooth transition of the magnetic field in more than one axis as shown in functions **714** and **716**, is indicative of a smooth movement of the detecting device within the detected magnetic field. For purposes of discussion, let this smooth change in the magnetic field correspond to the person, holding the device, entering a vehicle. Also noteworthy is a sudden change **728** in function **718**. This change which is detected in only one axis may be indicative of another event. For purposes of discussion, let this sudden change correspond to ignition of the vehicle. Therefore, in this example, the action of entering a specific vehicle and starting that specific vehicle may have a signature based on functions **712**, **714**, **716** and **718**.

[0065] **FIG. 8** illustrates another example of measured magnetic fields associated with a third vehicle in accordance with aspects of the present invention.

[0066] FIG. 8 includes a graph 802, a graph 804, a graph 806 and a graph 808, each of which share a common x-axis 810 in units of seconds. Graph 802 has a y-axis in units of  $\mu\text{T}$  and includes a function 812. Graph 804 has a y-axis in units of  $\mu\text{T}$  and includes a function 814. Graph 806 has a y-axis in units of  $\mu\text{T}$  and includes a function 816. Graph 808 has a y-axis in units of  $\mu\text{T}$  and includes a function 818.

[0067] Function 812 corresponds to the absolute value of the magnitude of a B of the third vehicle. Function 814 corresponds to the magnitude of B in a z-direction relative to field-detecting component 412. Function 816 corresponds to the magnitude of B in a y-direction relative to field-detecting component 412. Function 818 corresponds to the magnitude of B in an x-direction relative to field-detecting component 412.

[0068] A sudden change in the magnetic field manifests as a curve 820 in function 812, as a spike 822 in function 814, as a spike 824 in function 816 and as a spike 826 in function 818. A commonality of each of these features is a brief rotation of the magnetic field, which may be indicative of an event. In this example, the very brief rotation of the magnetic field in more than one axis, is indicative of a rotation the detecting device within the detected magnetic field. For purposes of discussion, let this quick change in the magnetic field correspond to the person, holding the device, entering a vehicle. Also noteworthy is a small bump 828 in function 812, a small bump 830 in function 814 and a small bump 832 in function 816. This small bump, which is detected in only two axes may be indicative of another event. For purposes of discussion, let this change correspond to ignition of the vehicle. Therefore, in this example, the action of entering a specific vehicle and starting that specific vehicle may have a signature based on functions 812, 814, 816 and 818.

[0069] Returning to FIG. 5, once the field is detected (S504), a signature is generated (S506). In some embodiments, for example as shown in FIG. 4, field-detecting component 412 may generate a signature of the vehicle based any of functions 612, 614, 616, 618 of FIG. 6, and combinations thereof. In some embodiments, field-detecting component 412 may additionally process any of functions 612, 614, 616, 618 and combinations thereof to generate such a signature. Non-limiting examples of further processes include averaging, adding, subtracting, and transforming any of functions 612, 614, 616, 618 and combinations thereof.

[0070] Returning to **FIG. 5**, once the signature is generated (**S506**), the signature is input into memory (**S508**). For example, as shown in **FIG. 4**, field-detecting component **412** provides the signature to input component **414** via communication line **446**.

[0071] In an example embodiment, input component **414** includes a GUI that informs a user of device **402** that a signature has been generated. Input component **414** may additionally enable the user to input an association between an item or location and the generated signature. For example, input component **414** may display on a GUI a message such as “A signature was generated. To what item/location is the signature associated?” Input component **414** may then display an input prompt for the user to input, via the GUI, an item/location to be associated with the generated signature.

[0072] Input component **414** may then provide the signature, and the association to a specific item or location, to database **404** via communication line **450**.

[0073] As discussed above, in some embodiments, database **404** is part of device **402**, whereas in other embodiments, database **404** is separate from device **402**. Data input and retrieval from database **404** may be faster when database **404** is part of device **402**, as opposed to cases where database **404** is distinct from device **402**. However, size may be a concern when designing device **402**, particularly when device **402** is intended to be a handheld device such as a smartphone. As such, device **402** may be much smaller when database **404** is distinct from device **402**, as opposed to cases where database **404** is part of device **402**.

[0074] Consider an example embodiment, where database **404** is part of device **402**. In such cases, input component **414** may enable a user to input signatures and the item/location associations, for a predetermined number of items/locations. In this manner, database **404** will only be used for device **402**.

[0075] Now consider an example embodiment, where database **404** is separate from device **402**. Further, let database **404** be much larger than the case where database **404** is part of device **402**. Still further, let database **404** be accessible to other devices in accordance with aspects of the present invention. In such cases, input component **414** may enable a user to input signatures and the item/location associations, for a much larger predetermined number of items/locations. Further, in such cases, input component **414** may enable other users of

similar devices to input signatures and the item/location associations, for even more items/locations.

[0076] An example embodiment may use the differentiating magnetic field properties between different vehicle types and makes to identify the different vehicle types and makes. Today's vehicles are fully equipped with electronic and mechanical actuators and switches, engine subsystems. All these subsystems are generating their own electromagnetic and magnetic fields and therefore will alter the overall three-dimensional properties and field strength fluctuations of the vehicle interior. Particularly the ignition of a vehicle generates a characteristic magnetic flux for every vehicle. Aspects of the present invention include a storing these field properties as signatures within database 404 through measurements in the near field within the vehicle interior for a reference group of make and models. As such, any user of a device may be able to identify a registered vehicle within database 404. Thus, through previously stored signatures and additional measurements, the present invention enables a library of vehicular electromagnetic signatures. This library may be augmented with additional measurements describing the electromagnetic signatures of different vehicles. This will be described in greater detail later with reference to **FIG. 13**.

[0077] At this point, method 500 stops (S510).

[0078] In the examples discussed above with respect to **FIGs. 6-8**, field-detecting component 412 is detecting magnetic fields as field vectors as functions over a period of time. The detected signals illustrated in **FIGs. 6-8** are easily distinguishable from one another. Accordingly, the vehicles associated therewith, respectively, may additionally be easily distinguishable from one another.

[0079] Returning to **FIG. 5**, method 500 may involve the detection of additional parameters to associate with an item or location. Specifically, additional aspects of the present invention are drawn to a system and method for determining a specific item and/or location by utilizing: 1) field properties within and/or near the specific item and or location; and 2) additionally detected parameters. In one non-limiting example embodiment, a smartphone is used to measure a magnetic field associated with a vehicle, and to measure velocity and/acceleration whether the user of the smartphone is in an identified vehicle.

[0080] For example, returning to **FIG. 4**, parameter-detecting component **422** may be used to detect another parameter for use in detecting the vehicle. For purposes of discussion, consider the example where a person is registering their vehicle based on the walking up to the vehicle, entering the vehicle and starting up of the vehicle, wherein parameter-detecting component **422** measured various accelerations of the device as it is being carried by the person. This example will now be described with additional reference to **FIGs. 9-11**.

[0081] **FIG. 9** illustrates an example of measured magnetic fields and of measured acceleration associated with the device being carried in accordance with aspects of the present invention.

[0082] **FIG. 9** includes graph **602**, graph **604**, graph **606** and graph **608**, in addition to a graph **902**, a graph **904**, a graph **906**, a graph **908**, a graph **910** and a graph **912**, each of which share a common x-axis **914** in units of seconds. **FIG. 9** additionally includes a line **916**. Graph **902** has a y-axis in units of  $m/s^2$  and includes a function **918**. Graph **904** has a y-axis in units of  $m/s^2$  and includes a function **920**. Graph **906** has a y-axis in units of  $m/s^2$  and includes a function **922**. Graph **908** has a y-axis in units of degrees and includes a function **924**. Graph **910** has a y-axis in units of degrees and includes a function **926**. Graph **912** has a y-axis in units of degrees and includes a function **928**.

[0083] Function **918** corresponds to the acceleration in a z-direction relative to parameter-detecting component **422**. Function **920** corresponds to the acceleration in a y-direction relative to parameter-detecting component **422**. Function **922** corresponds to the acceleration in an x-direction relative to parameter-detecting component **422**. Function **924** corresponds to the angular acceleration in a yaw direction relative to parameter-detecting component **422**. Function **926** corresponds to the angular acceleration in a pitch direction relative to parameter-detecting component **422**. Function **928** corresponds to the angular acceleration in a roll direction relative to parameter-detecting component **422**.

[0084] As noted, function **920**, the acceleration in the y-direction, changes dramatically. This corresponds to the up and down motion of a person walking. Further, a spike **930** corresponds to motion of the person sitting into the vehicle. A second spike **932** corresponds to the large vibration coincident with starting of the vehicle. As discussed above, spikes **620**, **622**, **624** and **626** correspond to the detected magnetic field associated with ignition of the vehicle. Now these two separate parameters may be analyzed together to more clearly



identify an event. In this example, a person is walking to, entering and starting a vehicle. As shown in each of functions **918**, **920** and **922**, the dramatic variations in detected acceleration in each axis (after the vehicle has been started as evidenced by the spikes in the detected magnetic fields of functions **612**, **614**, **616** and **618**) may be explained by way of the vibrations of the vehicle now that it is running. This is particularly telling by function **918**, or the acceleration in the z-axis (toward the vehicle). As the person is walking toward the vehicle, the constant walking velocity registers as no change in acceleration in this axis. However, after the vehicle is started, which shows as spike **934** in function **918**, acceleration changes in the z-axis as a result of the vehicle vibrating from the engine.

[0085] Functions **924**, **926** and **928** are shown here as further non-limiting examples of additional parameters that may be detected for use to identify a vehicle or location. In this example however, it should be noted that functions **928** includes a spike **936**. This spike in the “roll” rotational axis is indicative that the device is being rolled, which may correspond to the phone being in the user’s hand when entering the vehicle. This further supports the notion that a person is entering a vehicle. This evidence in conjunction with the magnetic and acceleration signatures may be used to accurately identify the vehicle.

[0086] The additionally detected parameter, in the above example of **FIG. 9**, reduces the likelihood of false positive identification of a vehicle with only a magnetic signature. In accordance with aspects of the present invention, the use of additional parameter signatures may provide evidence to correctly identify a vehicle – or if the case may be – correctly identify a location.

[0087] In some embodiments, parameter-detecting component **422** may generate an output associated with the vehicle based any of functions **918**, **920**, **922**, **924**, **926**, **928** and combinations thereof. In some embodiments, parameter-detecting component **422** may additionally process any of functions **918**, **920**, **922**, **924**, **926**, **928** and combinations thereof to generate such an output. Non-limiting examples of further processes include averaging, adding, subtracting, and transforming any of functions **918**, **920**, **922**, **924**, **926**, **928** and combinations thereof. In any of these embodiments, field-detecting component **412** may then generate a signature of the vehicle based any of functions **612**, **614**, **616**, **618** and combinations thereof and based on the output generated by parameter-detecting component **422**.

[0088] **FIG. 10** illustrates another example of measured magnetic fields and of measured acceleration associated with a vehicle in accordance with aspects of the present invention.

[0089] **FIG. 10** includes graph 702, graph 704, graph 706 and graph 708, in addition to a graph 1002, a graph 1004, a graph 1006, a graph 1008, a graph 1010 and a graph 1012, each of which share a common x-axis 1014 in units of seconds. **FIG. 10** additionally includes a line 1016. Graph 1002 has a y-axis in units of  $\text{m/s}^2$  and includes a function 1018. Graph 1004 has a y-axis in units of  $\text{m/s}^2$  and includes a function 1020. Graph 1006 has a y-axis in units of  $\text{m/s}^2$  and includes a function 1022. Graph 1008 has a y-axis in units of degrees and includes a function 1024. Graph 1010 has a y-axis in units of degrees and includes a function 1026. Graph 1012 has a y-axis in units of degrees and includes a function 1028.

[0090] Function 1018 corresponds to the acceleration in a z-direction relative to parameter-detecting component 422. Function 1020 corresponds to the acceleration in a y-direction relative to parameter-detecting component 422. Function 1022 corresponds to the acceleration in an x-direction relative to parameter-detecting component 422. Function 1024 corresponds to the angular acceleration in a yaw direction relative to parameter-detecting component 422. Function 1026 corresponds to the angular acceleration in a pitch direction relative to parameter-detecting component 422. Function 1028 corresponds to the angular acceleration in a roll direction relative to parameter-detecting component 422.

[0091] As discussed above with reference to **FIGs. 6-7**, by comparing the overall magnitudes of the detected magnetic fields between **FIG. 9** and **FIG. 10**, it is clear that the fields are associated with two different vehicles. However, there are additional differences between the detected parameters worth noting. As noted by functions 1018, 1020 and 1022, the acceleration changes very little until changes in the detected magnetic field as noted by 720, 724, 728 and 732. At this point in time, as evidenced by variations 1030, 1032 and 1034, the acceleration-detecting component is “jostled” in all three axes. This corresponds to the relatively constant motion of a person walking, followed by the person entering the vehicle. Furthermore, as noted by function 1024, 1026 and 1028 there is a generally constant yaw pitch and roll until the changes in the detected magnetic field as noted by 720, 724, 728 and 732. At this point in time, as evidenced by double variations 1036, 1038 and 1040, the rotation-detecting component is “spun” in all three axes. These signatures, in conjunction with the relatively low acceleration as noted in functions 1018, 1020 and 1022, may be

explained by the device being carried in a purse, for example. In such a case, being carried in a purse would buffer changes in acceleration, which is reflected in the relatively calm functions **1018**, **1020** and **1022**. When the person enters the vehicle and the purse is spun around and placed in a seat, double variations **1036**, **1038** and **1040** may result. This is further evidenced by the lack of acceleration or movement detected in any of functions **1018**, **1020**, **1022**, **1024**, **1026** and **1028** after entering the vehicle.

[0092] In some embodiments, parameter-detecting component **422** may generate an output associated with the vehicle based on any of functions **1018**, **1020**, **1022**, **1024**, **1026**, **1028** and combinations thereof. In some embodiments, parameter-detecting component **422** may additionally process any of functions **1018**, **1020**, **1022**, **1024**, **1026**, **1028** and combinations thereof to generate such an output. Non-limiting examples of further processes include averaging, adding, subtracting, and transforming any of functions **1018**, **1020**, **1022**, **1024**, **1026**, **1028** and combinations thereof. In any of these embodiments, field-detecting component **412** may then generate a signature of the vehicle based on any of functions **612**, **614**, **616**, **618** and combinations thereof and based on the output generated by parameter-detecting component **422**.

[0093] FIG. 11 illustrates another example of measured magnetic fields and of measured acceleration associated with a vehicle in accordance with aspects of the present invention.

[0094] FIG. 11 includes graph **802**, graph **804**, graph **806** and graph **808**, in addition to a graph **1102**, a graph **1104**, a graph **1106**, a graph **1108**, a graph **1110** and a graph **1112**, each of which share a common x-axis **1114** in units of seconds. FIG. 11 additionally includes a line **1116**. Graph **1102** has a y-axis in units of  $\text{m/s}^2$  and includes a function **1118**. Graph **1104** has a y-axis in units of  $\text{m/s}^2$  and includes a function **1120**. Graph **1106** has a y-axis in units of  $\text{m/s}^2$  and includes a function **1122**. Graph **1108** has a y-axis in units of degrees and includes a function **1124**. Graph **1110** has a y-axis in units of degrees and includes a function **1126**. Graph **1112** has a y-axis in units of degrees and includes a function **1128**.

[0095] Function **1118** corresponds to the acceleration in a z-direction relative to parameter-detecting component **422**. Function **1120** corresponds to the acceleration in a y-direction relative to parameter-detecting component **422**. Function **1122** corresponds to the acceleration in an x-direction relative to parameter-detecting component **422**. Function **1124** corresponds to the angular acceleration in a yaw direction relative to parameter-detecting

component **422**. Function **1126** corresponds to the angular acceleration in a pitch direction relative to parameter-detecting component **422**. Function **1128** corresponds to the angular acceleration in a roll direction relative to parameter-detecting component **422**.

[0096] By comparing the overall magnitudes of the detected magnetic fields between **FIGs. 9-11**, it is clear that the fields are associated with different vehicles. However, there are additional differences between the detected parameters worth noting. As noted by fluctuations **1130**, **1132** and **1134** of functions **1118**, **1120** and **1122**, respectively, the acceleration changes drastically in correspondence with changes in the detected magnetic field as noted by **820**, **822**, **824** and **826**. As discussed above, with reference to **FIG. 8**, this corresponds to entry into the vehicle. Further, as noted by spikes **1136**, **1138** and **1140** of functions **1118**, **1120** and **1122**, respectively, the acceleration changes drastically in correspondence with changes in the detected magnetic field as noted by **828**, **830** and **832**. As discussed above, with reference to **FIG. 8**, this ignition of the vehicle. At this point in time, as evidenced by spikes **1136**, **1138** and **1140**, the acceleration detecting component is “jostled” in all three axes.

[0097] Furthermore, as noted by function **1124**, **1126** and **1128** there is a generally constant yaw pitch and roll until the changes in the detected magnetic field as noted by **820**, **822**, **824** and **826**. At this point in time, as evidenced by changes **1142**, **1144** and **1146**, the rotation-detecting component is “spun” in all three axes as a result of the person entering the vehicle. Then the yaw pitch and roll remain constant for a period indicated by portions **1148**, **1150** and **1152** of functions **1124**, **1126** and **1128**, respectively. These signatures may be explained by the user setting the device down into one position after the entering the vehicle. At this point in time, as evidenced by changes **1142**, **1144** and **1146**, the rotation-detecting component is “spun” in all three axes as a result of the person entering the vehicle. Then the yaw pitch and roll again change as indicated by portions **1154**, **1156** and **1158** of functions **1124**, **1126** and **1128**, respectively. These signatures may be explained by the person moving the device.

[0098] In some embodiments, parameter-detecting component **422** may generate an output associated with the vehicle based any of functions **1118**, **1120**, **1122**, **1124**, **1126**, **1128** and combinations thereof. In some embodiments, parameter-detecting component **422** may additionally process any of functions **1118**, **1120**, **1122**, **1124**, **1126**, **1128** and combinations

thereof to generate such an output. Non-limiting examples of further processes include averaging, adding, subtracting, and transforming any of functions **1118**, **1120**, **1122**, **1124**, **1126**, **1128** and combinations thereof. In any of these embodiments, field-detecting component **412** may then generate a signature of the vehicle based any of functions **612**, **614**, **616**, **618** and combinations thereof and based on the output generated by parameter-detecting component **422**.

[0099] In the examples discussed above with respect to **FIGs. 9-11**, just as with the examples discussed above with respect to **FIGs. 6-8**, the detected magnetic signals are easily distinguishable from one another. Accordingly, the vehicles associated therewith, respectively, may additionally be easily distinguishable from one another. However, in situations where the magnetic field signatures may be somewhat similar, it may be more difficult for a device in accordance with aspects of the present invention to distinguish vehicles – solely on the detected magnetic (or electric or electro-magnetic) fields. As such, the use of further distinguishing with at least a second detected parameter may help distinguish the vehicles.

[00100] In the examples discussed above with respect to **FIGs. 9-11**, parameter-detecting component **422** is detecting acceleration vectors as functions over a period of time. The detected acceleration signals illustrated in **FIGs. 9-11** are easily distinguishable from one another. Accordingly, even if such vehicles had similar magnetic signatures, the vehicles associated with the detected acceleration signals, respectively, may additionally be easily distinguishable from one another.

[00101] The above discussed examples of **FIGs. 9-11** are merely provided for purposes of explanation and are not limiting. Clearly, any other type of detectable parameter may be used to additionally distinguish an item or location in accordance with aspects of the present invention.

[00102] It should be noted that the detected fields and parameters in the examples discussed above with reference to **FIGs. 6-11** are non-limiting examples. Each vehicle may have a distinct signature, just as each person may have a unique gait that will register a unique acceleration signature. An aspect of the present invention is the recording of a field signature, and in some cases an additional parameter signature, for future use to detect a vehicle or location.

[00103] In an example embodiment, field-detecting component **412** may detect magnetic field vectors associated with the approach and entry into vehicle **102**, for example as discussed above with reference to **FIGs. 1A-C**, whereas parameter-detecting component **422** may detect three dimensional acceleration associated with the gait of person **104**, the motion of person **104** opening door **108** and the motion of person **104** sitting in vehicle **102**. An overall signature may be generated based on the signatures generated from each of field-detecting component **412** and parameter-detecting component **422**.

[00104] In another example embodiment, field-detecting component **412** may detect magnetic field vectors associated the inside of vehicle **102** while it is operating, whereas parameter-detecting component **422** may detect ambient noise associated with the running engine and road noise associated with vehicle **102** while it is operating. An overall signature may be generated based on the signatures generated from each of field-detecting component **412** and parameter-detecting component **422**.

[00105] Returning to **FIG. 3**, after the item or location has been registered (**S304**), an item or location is detected (**S306**). For example, the next time the person approaches a vehicle, a device in accordance with aspects of the present invention would detect a field associated with the vehicle. Similarly, for example, the next time the person approaches a location, a device in accordance with aspects of the present invention would detect a field associated with the location. A more detailed discussion of registration will now be provided with additional reference to **FIG.12**.

[00106] **FIG. 12** illustrates an example method **1200** of detecting an item or a location in accordance with aspects of the present invention.

[00107] Method **1200** starts (**S1202**) and a field is detected (**S1204**). This is the same as the field being detected (**S504**) as discussed above with reference to method **500**. For example, returning to **FIG. 4**, field-detecting component **412** detects a new field. For purposes of discussion, let the new field be a magnetic field corresponding to the superposition of magnetic fields generated by all electronic and mechanical systems involved with the ignition of a vehicle.

[00108] Returning to **FIG. 12**, once the field is detected (**S1204**), a signature is generated (**S1206**). This is similar to the signature being generated (**S506**) as discussed

above with reference to method **500**. In some embodiments, for example as shown in **FIG. 4**, field-detecting component **412** may generate a signature of the vehicle based any of functions **612, 614, 616, 618** of **FIG. 6**, and combinations thereof. In some embodiments, field-detecting component **412** may additionally process any of functions **612, 614, 616, 618** and combinations thereof to generate such a signature. Non-limiting examples of further processes include averaging, adding, subtracting, and transforming any of functions **612, 614, 616, 618** and combinations thereof.

[00109] This second signature is provided to comparing component **418** via communication line **448**.

[00110] At this point, method **1200** stops (**S1208**).

[00111] Returning to **FIG. 3**, after the item or location has been detected (**S306**), it is verified (**S308**). For example, a device in accordance with aspects of the present invention would determine whether the newly detected vehicle is the vehicle that was previously registered. Similarly, a device in accordance with aspects of the present invention would determine whether the newly detected location is the location that was previously registered. A more detailed discussion of registration will now be provided with additional reference to **FIG.13**.

[00112] **FIG. 13** illustrates an example method **1300** of verifying an item or a location in accordance with aspects of the present invention.

[00113] Method **1300** starts (**S1302**) and the previously stored signature is accessed (**S1304**). For example, as shown in **FIG. 4**, access component **416** retrieves the previously-stored signature from database **404** via communication line **454**. Access component **416** then provides the retrieved, previously-stored signature to comparator **418** via communication line **456**.

[00114] Returning to **FIG. 13**, now that the previously stored signature has been accessed (**S1304**), the signatures are compared (**S1306**). For example, as shown in **FIG. 4**, comparator **418** compares the retrieved, previously stored signature as provided by access component **416** with the newly generated signature as provided by field-detecting component **412**.

[00115] Returning to **FIG. 13**, now that the signatures have been compared (**S1306**), the item/location may be identified (**S1308**). For example, as shown in **FIG. 4**, comparator **418** provides an output to identifying component **420** via communication line **458**. If the retrieved, previously stored signature as provided by access component **416** matches the newly generated signature as provided by field-detecting component **412**, then the newly detected item/location is the same item/location that was previously registered. In such a case, identifying component **420** may indicate that the newly detected item/location is the same item/location that was previously registered. If the retrieved, previously stored signature as provided by access component **416** does not match the newly generated signature as provided by field-detecting component **412**, then the newly detected item/location is not the same item/location that was previously registered. In such a case, identifying component **420** may indicate that the newly detected item/location is the same item/location that was previously registered.

[00116] At this point, method **1300** stops (**S1310**).

[00117] Returning to **FIG. 3**, after the item or location has been verified, the data is updated (**S310**). For example, in some embodiments, as shown in **FIG. 4**, comparator **418** may determine that the previously stored signature as provided by access component **416** does not exactly match the newly generated signature as provided by field-detecting component **412**, but the difference between the previously stored signature as provided by access component **416** does not exactly match the newly generated signature as provided by field-detecting component **412** is within a predetermined acceptable limit. In such cases, identifying component **420** may indicate that the newly detected item/location is still the same item/location that was previously registered. Further, comparator **418** may provide the newly generated signature as provided by field-detecting component **412** to access component **416** via communication line **456**. Access component **416** may then provide the newly generated signature to database **404** via communication line **454**.

[00118] In this manner, database **404** may be “taught” to accept variations of previously registered signatures. In some embodiments, an average of recognized signatures may be stored for future use. In some embodiments, a plurality of each recognized signature may be stored for future use.

[00119] Returning to **FIG. 3**, device **402** waits to detect a new field (**S306**).



**[00120]** The example embodiments discussed above are drawn to identifying an item or location using fields associated therewith. Once identified, other functions may be available. For example, consider the situation wherein a device in accordance with aspects of the present invention is embodied in a smartphone. In such an example, once an item (e.g., a vehicle) or a location (e.g., a house) is identified, the smartphone may institute a suite of applications and turn off other applications. In a specific example embodiment, the identification of a vehicle may be used to place a smartphone in a “Vehicle Mode,” wherein the smartphone will operate in a particular manner because it is determined to be in a vehicle.

**[00121]** In accordance with aspects of the present invention discussed above, the sensors and functionalities of smartphones can be used to supplement or even replace the known vehicle-based techniques of vehicle telematics. More specifically, smartphone-to-smartphone (when both phones are in Vehicle Mode), smartphone-to-infrastructure and infrastructure-to-smartphone communications (again, when the smartphone is in Vehicle Mode) can provide drivers with a wide range of telematics services and features, while resulting in little or no additional cost to the vehicle driver (because she likely already has a smartphone) or the vehicle manufacturer (because it doesn’t have to provide the purchaser of the vehicle with a smartphone and also doesn’t have to embed costly vehicle telematics equipment in the vehicle). To be able to do so, however, the smartphone again has to be able to “know” that it is in Vehicle Mode and be able to determine in what vehicle it is. Ideally for various applications it is necessary to be able to determine if the smartphone is in the vehicle that is owned by the smartphone user. Aspects of the present invention enable a smartphone to know that it is in Vehicle Mode based on detected magnetic, electric, magneto-electric fields and combinations thereof.

**[00122]** Further in accordance with the present invention, a smartphone may utilize its magnetometer function to periodically measure the electromagnetic levels sensed at the smartphone’s current location. The smartphone uses its processing capabilities to try to map the periodic electromagnetic levels sensed by the smartphone with the vehicular electromagnetic signatures stored in library. If the periodic electromagnetic levels sensed by the smartphone match any of the specific vehicle signatures stored in the library, then the processor of the smartphone may generate and/or otherwise output a signal indicating that the smartphone is located in the specific vehicle, which in turn will be used by the Vehicle Mode detection method to trigger certain functions.

**[00123]** The Vehicle Mode relevant sensor suite may be monitored at intervals depending on detected speed and location, for example, up to several times per second. The magneto metric sensor output may be monitored dependent on the accelerometer output as this will indicate a movement of the phone either within the vehicle environment or of the vehicle itself.

**[00124]** In the drawings and specification, there have been disclosed embodiments of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being set forth in the following claims.

## CLAIMS

What is claimed as new and desired to be protected by Letters Patent of the United States is:

1. A device, for use with a database, said device comprising:
  - a field-detecting component operable to detect at least one of an electric field, a magnetic field and an electro-magnetic field and to generate a detected field signature based on the detected one of an electric field, a magnetic field and an electro-magnetic field;
  - an input component operable to input the detected field signature into the database;
  - an accessing component operable to access the detected field signature from the database;
  - a comparing component operable to generate a comparison signal; and
  - an identifying component operable to identify one of an item and a location based on the comparison signal,wherein said field-detecting component is further operable to detect a second one of an electric field, a magnetic field and an electro-magnetic field and to generate a second detected field signature based on the detected second one of an electric field, a magnetic field and an electro-magnetic field, and
  - wherein said comparing component is operable to generate the comparison signal based on a comparison of the detected field signature and the second detected field signature.
2. The device of claim 1, wherein said field-detecting component is operable to detect the at least one of an electric field, a magnetic field and an electro-magnetic field as a function over a period of time.
3. The device of claim 1, further comprising:
  - a parameter-detecting component operable to detect a parameter and to generate a parameter signal based on the detected parameter,wherein said identifying component is operable to identify the one of an item and a location based additionally on the parameter signal.
4. The device of claim 3, wherein said parameter-detecting component is operable to detect, as the parameter, one of the group consisting of a velocity, acceleration, angular

velocity, angular acceleration, geodetic position, sound, temperature, vibrations, pressure, biometrics, contents of surrounding atmosphere and combinations thereof.

5. The device of claim 1, further comprising a communication component operable to wirelessly communicate with a network.

6. The device of claim 1,  
wherein said field-detecting component is operable to detect a magnetic field,  
wherein said input component is further operable to input an association between a vehicle and the detected magnetic field,  
wherein said field-detecting component is further operable to detect a second magnetic field and to generate a second detected field signature based on the detected second magnetic field, and  
wherein said identifying component is further operable, based on the association, to identify the vehicle as the item.

7. The device of claim 6, further comprising:  
a verification component operable to provide a request for verification based on the comparison signal and the association,  
wherein said input component is further operable to input a verification based on the request for verification.

8. A method, for use with a database, said method comprising:  
detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field;  
generating, via the field-detecting component, a detected field signature based on the detected one of an electric field, a magnetic field and an electro-magnetic field;  
inputting, via an input component, the detected field signature into the database;  
accessing, via an accessing component, the detected field signature from the database;  
generating, via a comparing component, a comparison signal;  
identifying, via an identifying component, one of an item and a location based on the comparison signal;

detecting, via the field-detecting component, a second one of an electric field, a magnetic field and an electro-magnetic field; and

generating, via the field-detecting component, a second detected field signature based on the detected second one of an electric field, a magnetic field and an electro-magnetic field,

wherein said generating a comparison signal comprises generating the comparison signal based on a comparison of the detected field signature and the second detected field signature.

9. The method of claim 8, wherein said detecting comprises detecting the at least one of an electric field, a magnetic field and an electro-magnetic field as a function over a period of time.

10. The method of claim 8, further comprising:

detecting, via a parameter-detecting component, a parameter; and

generating, via the parameter-detecting component, a parameter signal based on the detected parameter,

wherein said identifying comprises identifying the one of an item and a location based additionally on the parameter signal.

11. The method of claim 10, wherein said detecting a parameter comprises detecting, as the parameter, one of the group consisting of a velocity, acceleration, angular velocity, angular acceleration, geodetic position, sound, temperature, vibrations, pressure, biometrics, contents of surrounding atmosphere and combinations thereof.

12. The method of claim 8, further comprising wirelessly communicating, via a communication component, with a network.

13. The method of claim 8, further comprising:

inputting, via the input component is further operable to input an association; and

identifying, via the identifying component, a vehicle,

wherein said detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field comprises detecting detect a magnetic field,

wherein said inputting an association comprises inputting an association between a vehicle and the detected magnetic field,

wherein said detecting a second one of an electric field, a magnetic field and an electro-magnetic field comprises detecting a second magnetic field,

wherein said generating a second detected field signature comprises generating a second detected field signature based on the detected second magnetic field, and

wherein said identifying a vehicle comprises identifying, based on the association, the vehicle as the item.

14. The method of claim 13, further comprising:

providing, via a verification component, operable to provide a request for verification based on the comparison signal and the association; and

inputting, via the input component, a verification based on the request for verification.

15. A non-transitory, tangible, computer-readable media having computer-readable instructions stored thereon, for use with a database, the computer-readable instructions being capable of being read by a computer and being capable of instructing the computer to perform the method comprising:

detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field;

generating, via the field-detecting component, a detected field signature based on the detected one of an electric field, a magnetic field and an electro-magnetic field;

inputting, via an input component, the detected field signature into the database;

accessing, via an accessing component, the detected field signature from the database;

generating, via a comparing component, a comparison signal;

identifying, via an identifying component, one of an item and a location based on the comparison signal;

detecting, via the field-detecting component, a second one of an electric field, a magnetic field and an electro-magnetic field; and

generating, via the field-detecting component, a second detected field signature based on the detected second one of an electric field, a magnetic field and an electro-magnetic field,

wherein said generating a comparison signal comprises generating the comparison signal based on a comparison of the detected field signature and the second detected field signature.

16. The non-transitory, tangible, computer-readable media of claim 15, wherein the computer-readable instructions are capable of instructing the computer to perform the method such that said detecting comprises detecting the at least one of an electric field, a magnetic field and an electro-magnetic field as a function over a period of time.

17. The non-transitory, tangible, computer-readable media of claim 15, the computer-readable instructions being capable of being read by a computer and being capable of instructing the computer to perform the method further comprising:

detecting, via a parameter-detecting component, a parameter; and

generating, via the parameter-detecting component, a parameter signal based on the detected parameter,

wherein said identifying comprises identifying the one of an item and a location based additionally on the parameter signal.

18. The non-transitory, tangible, computer-readable media of claim 17, wherein the computer-readable instructions are capable of instructing the computer to perform the method such that said detecting a parameter comprises detecting, as the parameter, one of the group consisting of a velocity, acceleration, angular velocity, angular acceleration, geodetic position, sound, temperature, vibrations, pressure, biometrics, contents of surrounding atmosphere and combinations thereof.

19. The non-transitory, tangible, computer-readable media of claim 15, the computer-readable instructions being capable of being read by a computer and being capable of instructing the computer to perform the method further comprising wirelessly communicating, via a communication component, with a network.

20. The non-transitory, tangible, computer-readable media of claim 15, the computer-readable instructions being capable of instructing the computer to perform the method further comprising:

inputting, via the input component is further operable to input an association; and  
identifying, via the identifying component, a vehicle,  
wherein said detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field comprises detecting a magnetic field,  
wherein said inputting an association comprises inputting an association between a vehicle and the detected magnetic field,  
wherein said detecting a second one of an electric field, a magnetic field and an electro-magnetic field comprises detecting a second magnetic field,  
wherein said generating a second detected field signature comprises generating a second detected field signature based on the detected second magnetic field, and  
wherein said identifying a vehicle comprises identifying, based on the association, the vehicle as the item.

21. The non-transitory, tangible, computer-readable media of claim 20, the computer-readable instructions being capable of instructing the computer to perform the method further comprising:

providing, via a verification component, operable to provide a request for verification based on the comparison signal and the association; and  
inputting, via the input component, a verification based on the request for verification.

22. A device, for use with a database having stored therein, at least one of a first plurality of signatures, a second plurality of signatures and a third plurality of signatures, the first plurality of signatures corresponding to a plurality of electric fields, respectively, the second plurality of signatures corresponding to a plurality of magnetic fields, respectively, the third plurality of signatures corresponding to a plurality of electro-magnetic fields, respectively, said device comprising:

an accessing component operable to access one of the first plurality of signatures, the second plurality of signatures and the third plurality of signatures from the database;  
a field-detecting component operable to detect at least one of an electric field, a magnetic field and an electro-magnetic field and to generate a detected field signature based on the detected one of said fields;  
a comparing component operable to generate a comparison signal; and



an identifying component operable to identify one of an item and a location based on the comparison signal,

wherein, when said field-detecting component is operable to detect an electric field, said comparison component is operable to generate the comparison signal based on a comparison of the detected field signature and the first plurality of signatures,

wherein, when said field-detecting component is operable to detect a magnetic field, said comparison component is operable to generate the comparison signal based on a comparison of the detected field signature and the second plurality of signatures, and

wherein, when said field-detecting component is operable to detect an electro-magnetic field, said comparison component is operable to generate the comparison signal based on a comparison of the detected field signature and the third plurality of signatures.

23. The device of claim 22, wherein said field-detecting component is operable to detect the at least one of an electric field, a magnetic field and an electro-magnetic field as a function over a period of time.

24. The device of claim 22, further comprising:

a parameter-detecting component operable to detect a parameter and to generate a parameter signal based on the detected parameter,

wherein said identifying component is operable to identify the one of an item and a location based additionally on the parameter signal.

25. The device of claim 24, wherein said parameter-detecting component is operable to detect, as the parameter, one of the group consisting of a velocity, acceleration, angular velocity, angular acceleration, geodetic position, sound, temperature, vibrations, pressure, biometrics, contents of surrounding atmosphere and combinations thereof.

26. The device of claim 22, further comprising a communication component operable to wirelessly communicate with a network.

27. The device of claim 22,

wherein said field-detecting component is operable to detect a magnetic field,

wherein said input component is further operable to input an association between a vehicle and the detected magnetic field,

wherein said field-detecting component is further operable to detect a second magnetic field and to generate a second detected field signature based on the detected second magnetic field, and

wherein said identifying component is further operable, based on the association, to identify the vehicle as the item.

28. The device of claim 27, further comprising:

a verification component operable to provide a request for verification based on the comparison signal and the association,

wherein said input component is further operable to input a verification based on the request for verification.

29. A method, for use with a database having stored therein, at least one of a first plurality of signatures, a second plurality of signatures and a third plurality of signatures, the first plurality of signatures corresponding to a plurality of electric fields, respectively, the second plurality of signatures corresponding to a plurality of magnetic fields, respectively, the third plurality of signatures corresponding to a plurality of electro-magnetic fields, respectively, said method comprising:

accessing, via an accessing component, one of the first plurality of signatures, the second plurality of signatures and the third plurality of signatures from the database;

detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field;

generating, via a field-detecting component, a detected field signature based on the detected one of an electric field, a magnetic field and an electro-magnetic field;

generating, via a comparing component, a comparison signal; and

identifying, via an identifying component, one of an item and a location based on the comparison signal,

wherein, when said detecting comprises detecting an electric field, said generating comprises generating the comparison signal based on a comparison of the detected field signature and the first plurality of signatures,

wherein, when said detecting comprises detecting a magnetic field, said generating comprises generating the comparison signal based on a comparison of the detected field signature and the second plurality of signatures, and

wherein, when said detecting comprises detecting an electro-magnetic field, said generating comprises generating the comparison signal based on a comparison of the detected field signature and the third plurality of signatures.

30. The method of claim 29, wherein said detecting comprises detecting the at least one of an electric field, a magnetic field and an electro-magnetic field as a function over a period of time.

31. The method of claim 29, further comprising:  
detecting, via a parameter-detecting component, a parameter; and  
generating, via the parameter-detecting component, a parameter signal based on the detected parameter,  
wherein said identifying comprises identifying the one of an item and a location based additionally on the parameter signal.

32. The method of claim 31, wherein said detecting a parameter comprises detecting, as the parameter, one of the group consisting of velocity, acceleration, angular velocity, angular acceleration, geodetic position, sound, temperature, vibrations, pressure, biometrics, contents of surrounding atmosphere and combinations thereof.

33. The method of claim 29, further comprising wirelessly communicating, via a communication component, with a network.

34. The method of claim 29, further comprising:  
inputting, via the input component is further operable to input an association; and  
identifying, via the identifying component, a vehicle,  
wherein said detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field comprises detecting detect a magnetic field,

wherein said inputting an association comprises inputting an association between a vehicle and the detected magnetic field,

wherein said detecting a second one of an electric field, a magnetic field and an electro-magnetic field comprises detecting a second magnetic field,

wherein said generating a second detected field signature comprises generating a second detected field signature based on the detected second magnetic field, and

wherein said identifying a vehicle comprises identifying, based on the association, the vehicle as the item.

35. The method of claim 34, further comprising:

providing, via a verification component, operable to provide a request for verification based on the comparison signal and the association; and

inputting, via the input component, a verification based on the request for verification.

36. A non-transitory, tangible, computer-readable media having computer-readable instructions stored thereon, for use with a database having stored therein, at least one of a first plurality of signatures, a second plurality of signatures and a third plurality of signatures, the first plurality of signatures corresponding to a plurality of electric fields, respectively, the second plurality of signatures corresponding to a plurality of magnetic fields, respectively, the third plurality of signatures corresponding to a plurality of electro-magnetic fields, respectively, the computer-readable instructions being capable of being read by a computer and being capable of instructing the computer to perform the method comprising:

accessing, via an accessing component, one of the first plurality of signatures, the second plurality of signatures and the third plurality of signatures from the database;

detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field;

generating, via a field-detecting component, a detected field signature based on the detected one of an electric field, a magnetic field and an electro-magnetic field;

generating, via a comparing component, a comparison signal; and

identifying, via an identifying component, one of an item and a location based on the comparison signal,

wherein, when said detecting comprises detecting an electric field, said generating comprises generating the comparison signal based on a comparison of the detected field signature and the first plurality of signatures,

wherein, when said detecting comprises detecting a magnetic field, said generating comprises generating the comparison signal based on a comparison of the detected field signature and the second plurality of signatures, and

wherein, when said detecting comprises detecting an electro-magnetic field, said generating comprises generating the comparison signal based on a comparison of the detected field signature and the third plurality of signatures.

37. The non-transitory, tangible, computer-readable media of claim 36, wherein the computer-readable instructions are capable of instructing the computer to perform the method such that said detecting comprises detecting the at least one of an electric field, a magnetic field and an electro-magnetic field as a function over a period of time.

38. The non-transitory, tangible, computer-readable media of claim 36, the computer-readable instructions being capable of being read by a computer and being capable of instructing the computer to perform the method further comprising:

detecting, via a parameter-detecting component, a parameter; and

generating, via the parameter-detecting component, a parameter signal based on the detected parameter,

wherein said identifying comprises identifying the one of an item and a location based additionally on the parameter signal.

39. The non-transitory, tangible, computer-readable media of claim 38, wherein the computer-readable instructions are capable of instructing the computer to perform the method such that said detecting a parameter comprises detecting, as the parameter, one of the group consisting of velocity, acceleration, angular velocity, angular acceleration, geodetic position, sound, temperature, vibrations, pressure, biometrics, contents of surrounding atmosphere and combinations thereof.

40. The non-transitory, tangible, computer-readable media of claim 36, the computer-readable instructions being capable of being read by a computer and being capable of

instructing the computer to perform the method further comprising wirelessly communicating, via a communication component, with a network.

41. The non-transitory, tangible, computer-readable media of claim 36, the computer-readable instructions being capable of instructing the computer to perform the method further comprising:

inputting, via the input component is further operable to input an association; and

identifying, via the identifying component, a vehicle,

wherein said detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field comprises detecting detect a magnetic field,

wherein said inputting an association comprises inputting an association between a vehicle and the detected magnetic field,

wherein said detecting a second one of an electric field, a magnetic field and an electro-magnetic field comprises detecting a second magnetic field,

wherein said generating a second detected field signature comprises generating a second detected field signature based on the detected second magnetic field, and

wherein said identifying a vehicle comprises identifying, based on the association, the vehicle as the item.

42. The non-transitory, tangible, computer-readable media of claim 41, the computer-readable instructions being capable of instructing the computer to perform the method further comprising:

providing, via a verification component, operable to provide a request for verification based on the comparison signal and the association; and

inputting, via the input component, a verification based on the request for verification.

**ABSTRACT**

A device includes a field-detecting component, an input component, an accessing component, a comparing component and an identifying component. The field-detecting component can detect a field and generate a detected field signature based thereon. The input component can input the detected field signature into a database. The accessing component can access the detected field signature from the database. The comparing component can generate a comparison signal. The identifying component can identify item or location based on the comparison signal. The field-detecting component can further detect a second field and generate a second detected field signature based on the detected second field. The comparing component can generate the comparison signal based on a comparison of the detected field signature and the second detected field signature.

| Electronic Patent Application Fee Transmittal |          |                                                                                |        |                      |
|-----------------------------------------------|----------|--------------------------------------------------------------------------------|--------|----------------------|
| Application Number:                           |          |                                                                                |        |                      |
| Filing Date:                                  |          |                                                                                |        |                      |
| Title of Invention:                           |          | System and Method for Identifying Vehicle by Utilizing Detected Magnetic Field |        |                      |
| First Named Inventor/Applicant Name:          |          | Sascha Simon                                                                   |        |                      |
| Filer:                                        |          | John T. Whelan                                                                 |        |                      |
| Attorney Docket Number:                       |          | APIO-ID                                                                        |        |                      |
| Filed as Small Entity                         |          |                                                                                |        |                      |
| Utility under 35 USC 111(a) Filing Fees       |          |                                                                                |        |                      |
| Description                                   | Fee Code | Quantity                                                                       | Amount | Sub-Total in USD(\$) |
| <b>Basic Filing:</b>                          |          |                                                                                |        |                      |
| Utility filing Fee (Electronic filing)        | 4011     | 1                                                                              | 70     | 70                   |
| Utility Search Fee                            | 2111     | 1                                                                              | 300    | 300                  |
| Utility Examination Fee                       | 2311     | 1                                                                              | 360    | 360                  |
| <b>Pages:</b>                                 |          |                                                                                |        |                      |
| <b>Claims:</b>                                |          |                                                                                |        |                      |
| Claims in excess of 20                        | 2202     | 22                                                                             | 40     | 880                  |
| Independent Claims in Excess of 3             | 2201     | 3                                                                              | 210    | 630                  |
| <b>Miscellaneous-Filing:</b>                  |          |                                                                                |        |                      |



| Description                              | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|------------------------------------------|----------|----------|--------|----------------------|
| <b>Petition:</b>                         |          |          |        |                      |
| <b>Patent-Appeals-and-Interference:</b>  |          |          |        |                      |
| <b>Post-Allowance-and-Post-Issuance:</b> |          |          |        |                      |
| <b>Extension-of-Time:</b>                |          |          |        |                      |
| <b>Miscellaneous:</b>                    |          |          |        |                      |
| <b>Total in USD (\$)</b>                 |          |          |        | <b>2240</b>          |

| Electronic Acknowledgement Receipt   |                                                                                |
|--------------------------------------|--------------------------------------------------------------------------------|
| EFS ID:                              | 17319733                                                                       |
| Application Number:                  | 14072231                                                                       |
| International Application Number:    |                                                                                |
| Confirmation Number:                 | 1942                                                                           |
| Title of Invention:                  | System and Method for Identifying Vehicle by Utilizing Detected Magnetic Field |
| First Named Inventor/Applicant Name: | Sascha Simon                                                                   |
| Customer Number:                     | 54671                                                                          |
| Filer:                               | John T. Whelan                                                                 |
| Filer Authorized By:                 |                                                                                |
| Attorney Docket Number:              | APIO-ID                                                                        |
| Receipt Date:                        | 05-NOV-2013                                                                    |
| Filing Date:                         |                                                                                |
| Time Stamp:                          | 15:49:30                                                                       |
| Application Type:                    | Utility under 35 USC 111(a)                                                    |

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|                                                 |                                                     |                                    |                                                                 |     |    |
|-------------------------------------------------|-----------------------------------------------------|------------------------------------|-----------------------------------------------------------------|-----|----|
| 1                                               | Application Data Sheet                              | ApioVehicleIDADS.pdf               | 2279620<br><div>0e856b61193e3efea872c077b319d4eb023854a</div>   | no  | 7  |
| Warnings:                                       |                                                     |                                    |                                                                 |     |    |
| Information:                                    |                                                     |                                    |                                                                 |     |    |
| This is not an USPTO supplied ADS fillable form |                                                     |                                    |                                                                 |     |    |
| 2                                               | Oath or Declaration filed                           | ApioVehicleIdDec.pdf               | 204035<br><div>a14fc866deb7d40bf0fe59745d3f0f22d62de602</div>   | no  | 1  |
| Warnings:                                       |                                                     |                                    |                                                                 |     |    |
| Information:                                    |                                                     |                                    |                                                                 |     |    |
| 3                                               | Drawings-only black and white line drawings         | APIOVehicleIDDrawingsFinal.pdf     | 736536<br><div>c8c1a276ab3631251a2e98d3309a5a0c1cec8f5bd</div>  | no  | 10 |
| Warnings:                                       |                                                     |                                    |                                                                 |     |    |
| Information:                                    |                                                     |                                    |                                                                 |     |    |
| 4                                               |                                                     | ApioVehicleIDApplicationFinal3.pdf | 25583960<br><div>4a2a33ff19ecc389c89d0a0e57b861602974e677</div> | yes | 40 |
|                                                 | Multipart Description/PDF files in .zip description |                                    |                                                                 |     |    |
|                                                 | Document Description                                |                                    | Start                                                           | End |    |
|                                                 | Specification                                       |                                    | 1                                                               | 27  |    |
|                                                 | Claims                                              |                                    | 28                                                              | 39  |    |
|                                                 | Abstract                                            |                                    | 40                                                              | 40  |    |
| Warnings:                                       |                                                     |                                    |                                                                 |     |    |
| Information:                                    |                                                     |                                    |                                                                 |     |    |
| 5                                               | Fee Worksheet (SB06)                                | fee-info.pdf                       | 37759<br><div>5ba9b077c794dcd036cab4aef34353978f4906d</div>     | no  | 2  |
| Warnings:                                       |                                                     |                                    |                                                                 |     |    |
| Information:                                    |                                                     |                                    |                                                                 |     |    |
| Total Files Size (in bytes):                    |                                                     |                                    | 28841910                                                        |     |    |

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

**New Applications Under 35 U.S.C. 111**

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

**National Stage of an International Application under 35 U.S.C. 371**

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

**New International Application Filed with the USPTO as a Receiving Office**

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

## **SCORE Placeholder Sheet for IFW Content**

Application Number: 14072231

Document Date: 11/05/2013

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

- Drawings – Other than Black and White Line Drawings

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

To access the documents in the SCORE database, refer to instructions below.

At the time of document entry (noted above):

- Examiners may access SCORE content via the eDAN interface.
- Other USPTO employees can bookmark the current SCORE URL (<http://Score.uspto.gov/ScoreAccessWeb/>).
- External customers may access SCORE content via the Public and Private PAIR interfaces.

Form Revision Date: September 30, 2013



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|--------------------|-----------------------|-----------------------|------------------------|
| 14/072,231         | 11/05/2013            | Sascha Simon          | APIO-ID                |

CONFIRMATION NO. 1942

FORMALITIES LETTER

54671

The Law Office of John T. Whelan, LLC  
2315 Hallowing Point Road  
Prince Frederick, MD 20678



Date Mailed: 11/25/2013

NOTICE TO FILE CORRECTED APPLICATION PAPERS

*Filing Date Granted*

An application number and filing date have been accorded to this application. The application is informal since it does not comply with the regulations for the reason(s) indicated below. Applicant is given TWO MONTHS from the date of this Notice within which to correct the informalities indicated below. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

The required item(s) identified below must be timely submitted to avoid abandonment:

- A substitute specification in compliance with 37 CFR 1.52, 1.121(b)(3), and 1.125, is required. The substitute specification must be submitted with markings and be accompanied by a clean version (without markings) as set forth in 37 CFR 1.125(c) and a statement that the substitute specification contains no new matter (see 37 CFR 1.125(b)). The specification, claims, and/or abstract page(s) submitted is not acceptable and cannot be scanned or properly stored because:
  - The application contains drawings, but the specification does not contain a brief description of the several views of the drawings as required by 37 CFR 1.74 and 37 CFR 1.77(b)(7).

The following item(s) appear to have been **omitted** from the application:

- Figure(s) **14** described in the specification.

Applicant must reply to this notice within the time period set forth in this notice to avoid abandonment of this application. Applicant must select one of the three following options and the reply must comply with the requirements set forth in the selected option and any other requirements set forth in this notice. The reply should also indicate which option applicant has selected.

**I. Petition for date of deposit:** Should applicant contend that the above-noted omitted item(s) was in fact deposited in the U.S. Patent and Trademark Office (USPTO) with the nonprovisional application papers, a copy of this Notice and a petition (and \$400.00 petition fee (37 CFR 1.17(f))) with evidence of such deposit **must** be filed within **TWO MONTHS** of the date of this Notice. The petition fee will be refunded if it is determined that the item(s) was received by the USPTO. **THIS TWO MONTH PERIOD IS EXTENDABLE UNDER 37 CFR 1.136(a) or (b).**

**II. Petition for later filing date:** Should applicant desire to supply the omitted item(s) and accept the date that such omitted item(s) was filed in the USPTO as the filing date of the above-identified application, a copy of this Notice, the omitted item(s) (with a supplemental oath or declaration in compliance with 37 CFR 1.63 and 1.64 referring to such items), and a petition under 37 CFR 1.182 (with the \$400.00 petition fee (37 CFR 1.17(f))) requesting the later filing date **must** be filed within **TWO MONTHS** of the date of this Notice. **THIS TWO MONTH PERIOD IS EXTENDABLE UNDER 37 CFR 1.136(a) or (b).**

page 1 of 3

Applicant is advised that generally the filing fee required for an application is the filing fee in effect on the filing date accorded the application and that payment of the requisite basic filing fee on a date later than the filing date of the application requires payment of a surcharge (37 CFR 1.16(f)). To avoid processing delays and payment of a surcharge, applicant should submit any balance due for the requisite filing fee based on the later filing date being requested when submitting the omitted item(s) and the petition (and petition fee) requesting the later filing date.

**III. Acceptance of application as deposited:** Applicant may accept the application as deposited in the USPTO by filing an appropriate amendment as set forth in either (A) or (B) below within **TWO MONTHS** of the date of this Notice. **THIS TWO MONTH PERIOD IS EXTENDABLE UNDER 37 CFR 1.136(a) or (b)** . The application will maintain a filing date as of the date of deposit of the application papers in the USPTO, and original application papers (i.e., the original disclosure of the invention) will include only those application papers present in the USPTO on the date of deposit. A petition is not required for this option.

**(A)** If applicant wants to accept the application as deposited without adding the subject matter that was in the omitted item (e.g., a missing page or figure), applicant is required to submit one or more of the following items without adding any new matter (see 35 U.S.C. 132(a)):

1. For a missing page of the specification,
  - a) a substitute specification including claims that amends the specification to renumber the pages consecutively and cancels any incomplete sentences, and
  - b) a statement that the substitute specification includes no new matter, in compliance with 37 CFR 1.121(b)(3) and 1.125;
2. For a missing figure of the drawings,
  - a) replacement drawing sheets in compliance with 37 CFR 1.121(d) to renumber the drawing figures consecutively (if necessary),
  - b) a substitute specification excluding claims that amends the specification to cancel any references to any omitted drawing(s) and corrects the references in the specification to the drawing figures to correspond with any relabeled drawing figures, and
  - c) a statement that the substitute specification includes no new matter, in compliance with 37 CFR 1.121(b)(3) and 1.125;
3. For a missing page of the claim listing only, a replacement claim listing with the claims renumbered consecutively or, if amendment to the claims is also necessary, then a complete claim listing in compliance with 37 CFR 1.121(c);
4. For a missing or unreadable compact disc,
  - a) a substitute specification (excluding the claims) deleting the reference to the compact disc and the files contained on the compact disc, and
  - b) a statement that the substitute specification includes no new matter, in compliance with 37 CFR 1.121(b)(3) and 1.125; and
5. For a missing or unreadable file submitted on a compact disc,
  - a) a substitute specification (excluding the claims) deleting the reference to the missing or unreadable file, and a statement that the substitute specification includes no new matter, in compliance with 37 CFR 1.121(b)(3) and 1.125; and
  - b) a replacement transmittal letter listing all of the files except the missing or unreadable file in compliance with 37 CFR 1.52(e)(3)(ii).

**(B)** Alternatively, if applicant wants to accept the application as deposited but wishes to add the subject matter in the omitted item (e.g., a missing page or figure) by relying on an incorporation by reference under 37 CFR 1.57 or other portions of the original disclosure, applicant is required to submit one or more of the following items without adding any new matter (see 35 U.S.C. 132(a)):

1. To add the subject matter in a missing page of specification,
  - a) a substitute specification excluding claims and
  - b) a statement that the substitute specification includes no new matter, in compliance with 37 CFR 1.121(b)(3) and 1.125;

2. To add a missing figure of the drawings, new and replacement drawing sheets in compliance with 37 CFR 1.121(d);
3. To add the subject matter in a missing page of the claim listing, a complete claim listing in compliance with 37 CFR 1.121(c) (e.g., a claim in the missing page should be submitted as a new claim);
4. To add the subject matter in a missing or unreadable compact disc,
  - a) a replacement compact disc and a duplicate copy of the compact disc, in compliance with 37 CFR 1.52(e); and
  - b) a statement that the replacement compact disc contains no new matter in compliance with 37 CFR 1.52(e)(4); and,
5. To add the subject matter in a missing or unreadable file submitted on a compact disc,
  - a) a replacement compact disc that contains all of the files listed in the specification including the missing or unreadable file and a duplicate copy of the compact disc, in compliance with 37 CFR 1.52(e); and
  - b) a statement that the replacement compact disc contains no new matter in compliance with 37 CFR 1.52(e)(4).

If applicant is relying on an incorporation by reference under 37 CFR 1.57 to add the omitted subject matter, then applicant must also comply with the requirements of 37 CFR 1.57.

Applicant is cautioned that correction of the above items may cause the specification and drawings page count to exceed 100 pages. If the specification and drawings exceed 100 pages, applicant will need to submit the required application size fee.

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts  
Commissioner for Patents  
P.O. Box 1450  
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.  
<https://portal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html>

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at <http://www.uspto.gov/ebc>.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

/cnguyen/

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Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101





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| APPLICATION<br>NUMBER | FILING or<br>371(c) DATE | GRP ART<br>UNIT | FIL FEE REC'D | ATTY. DOCKET NO | TOT CLAIMS | IND CLAIMS |
|-----------------------|--------------------------|-----------------|---------------|-----------------|------------|------------|
| 14/072,231            | 11/05/2013               | 2858            | 2240          | APIO-ID         | 42         | 6          |

CONFIRMATION NO. 1942

54671

The Law Office of John T. Whelan, LLC  
2315 Hallowing Point Road  
Prince Frederick, MD 20678

FILING RECEIPT



OC000000065128412

Date Mailed: 11/25/2013

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Sascha Simon, Warwick, NY;

Applicant(s)

Sascha Simon, Warwick, NY;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 61/740,814 12/21/2012  
and claims benefit of 61/740,831 12/21/2012  
and claims benefit of 61/740,851 12/21/2012  
and claims benefit of 61/745,677 12/24/2012

**Foreign Applications** for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

*Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.*

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

**If Required, Foreign Filing License Granted:** 11/21/2013

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/072,231**

**Projected Publication Date:** To Be Determined - pending completion of Corrected Papers

**Non-Publication Request:** No

**Early Publication Request:** No

**\*\* SMALL ENTITY \*\***

**Title**

System and Method for Identifying Vehicle by Utilizing Detected Magnetic Field

**Preliminary Class**

324

**Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications:** No

## **PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES**

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

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**Title 35, United States Code, Section 184**  
**Title 37, Code of Federal Regulations, 5.11 & 5.15**

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| <b>PATENT APPLICATION FEE DETERMINATION RECORD</b><br>Substitute for Form PTO-875                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                               |                                  |          |                                    |               | Application or Docket Number<br>14/072,231 |                    |                         |                 |                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------|------------------------------------|---------------|--------------------------------------------|--------------------|-------------------------|-----------------|--------------------|
| <b>APPLICATION AS FILED - PART I</b>                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                               |                                  |          |                                    |               |                                            |                    |                         |                 |                    |
| (Column 1)                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                               | (Column 2)                       |          | SMALL ENTITY                       |               | OTHER THAN SMALL ENTITY                    |                    |                         |                 |                    |
| FOR                                                                                                                                                                                                                                                                                                                                                                                                        | NUMBER FILED                                                                                                                                                                                                                  | NUMBER EXTRA                     | RATE(\$) | FEE(\$)                            |               | RATE(\$)                                   | FEE(\$)            |                         |                 |                    |
| BASIC FEE<br><small>(37 CFR 1.16(a), (b), or (c))</small>                                                                                                                                                                                                                                                                                                                                                  | N/A                                                                                                                                                                                                                           | N/A                              | N/A      | 70                                 |               | N/A                                        |                    |                         |                 |                    |
| SEARCH FEE<br><small>(37 CFR 1.16(k), (l), or (m))</small>                                                                                                                                                                                                                                                                                                                                                 | N/A                                                                                                                                                                                                                           | N/A                              | N/A      | 300                                |               | N/A                                        |                    |                         |                 |                    |
| EXAMINATION FEE<br><small>(37 CFR 1.16(o), (p), or (q))</small>                                                                                                                                                                                                                                                                                                                                            | N/A                                                                                                                                                                                                                           | N/A                              | N/A      | 360                                |               | N/A                                        |                    |                         |                 |                    |
| TOTAL CLAIMS<br><small>(37 CFR 1.16(j))</small>                                                                                                                                                                                                                                                                                                                                                            | 42                                                                                                                                                                                                                            | minus 20 =<br>* 22               | x 40 =   | 880                                | OR            |                                            |                    |                         |                 |                    |
| INDEPENDENT CLAIMS<br><small>(37 CFR 1.16(h))</small>                                                                                                                                                                                                                                                                                                                                                      | 6                                                                                                                                                                                                                             | minus 3 =<br>* 3                 | x 210 =  | 630                                |               |                                            |                    |                         |                 |                    |
| APPLICATION SIZE FEE<br><small>(37 CFR 1.16(s))</small>                                                                                                                                                                                                                                                                                                                                                    | If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s). |                                  |          | 0.00                               |               |                                            |                    |                         |                 |                    |
| MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                               |                                  |          | 0.00                               |               |                                            |                    |                         |                 |                    |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                               |                                  | TOTAL    | 2240                               |               | TOTAL                                      |                    |                         |                 |                    |
| * If the difference in column 1 is less than zero, enter "0" in column 2.                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                               |                                  |          |                                    |               |                                            |                    |                         |                 |                    |
| <b>APPLICATION AS AMENDED - PART II</b>                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                               |                                  |          |                                    |               |                                            |                    |                         |                 |                    |
| (Column 1)                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                               | (Column 2)                       |          | (Column 3)                         |               | SMALL ENTITY                               |                    | OTHER THAN SMALL ENTITY |                 |                    |
| AMENDMENT A                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                               | CLAIMS REMAINING AFTER AMENDMENT |          | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | RATE(\$)                                   | ADDITIONAL FEE(\$) |                         | RATE(\$)        | ADDITIONAL FEE(\$) |
|                                                                                                                                                                                                                                                                                                                                                                                                            | Total<br><small>(37 CFR 1.16(i))</small>                                                                                                                                                                                      | *                                | Minus    | **                                 | =             | x                                          | =                  | OR                      | x               | =                  |
|                                                                                                                                                                                                                                                                                                                                                                                                            | Independent<br><small>(37 CFR 1.16(h))</small>                                                                                                                                                                                | *                                | Minus    | ***                                | =             | x                                          | =                  | OR                      | x               | =                  |
|                                                                                                                                                                                                                                                                                                                                                                                                            | Application Size Fee (37 CFR 1.16(s))                                                                                                                                                                                         |                                  |          |                                    |               |                                            |                    | OR                      |                 |                    |
|                                                                                                                                                                                                                                                                                                                                                                                                            | FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))                                                                                                                                                               |                                  |          |                                    |               |                                            |                    | OR                      |                 |                    |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                               |                                  |          |                                    |               | TOTAL ADD'L FEE                            |                    | OR                      | TOTAL ADD'L FEE |                    |
| (Column 1)                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                               | (Column 2)                       |          | (Column 3)                         |               | SMALL ENTITY                               |                    | OTHER THAN SMALL ENTITY |                 |                    |
| AMENDMENT B                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                               | CLAIMS REMAINING AFTER AMENDMENT |          | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | RATE(\$)                                   | ADDITIONAL FEE(\$) |                         | RATE(\$)        | ADDITIONAL FEE(\$) |
|                                                                                                                                                                                                                                                                                                                                                                                                            | Total<br><small>(37 CFR 1.16(i))</small>                                                                                                                                                                                      | *                                | Minus    | **                                 | =             | x                                          | =                  | OR                      | x               | =                  |
|                                                                                                                                                                                                                                                                                                                                                                                                            | Independent<br><small>(37 CFR 1.16(h))</small>                                                                                                                                                                                | *                                | Minus    | ***                                | =             | x                                          | =                  | OR                      | x               | =                  |
|                                                                                                                                                                                                                                                                                                                                                                                                            | Application Size Fee (37 CFR 1.16(s))                                                                                                                                                                                         |                                  |          |                                    |               |                                            |                    | OR                      |                 |                    |
|                                                                                                                                                                                                                                                                                                                                                                                                            | FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))                                                                                                                                                               |                                  |          |                                    |               |                                            |                    | OR                      |                 |                    |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                               |                                  |          |                                    |               | TOTAL ADD'L FEE                            |                    | OR                      | TOTAL ADD'L FEE |                    |
| * If the entry in column 1 is less than the entry in column 2, write "0" in column 3.<br>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".<br>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".<br>The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1. |                                                                                                                                                                                                                               |                                  |          |                                    |               |                                            |                    |                         |                 |                    |



Am

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

In re Patent Application of:

Sascha Simon

Application No.: 14/072,231

Confirmation No.: 1942

Filed: 11/05/2013

Art Unit: Not Yet Assigned

**PRELIMINARY AMENDMENT**

MS Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

**INTRODUCTORY COMMENTS**

In response to the Notice to File Corrected Application Papers dated November 25, 2013 (Notice), and prior to examination, please amend the above-identified U.S. patent application as follows:

Application No. 14/072,231  
Amendment dated January 27, 2014

Docket No.: APIO-ID

Specification

In the specification, please replace the specification with the attached substitute specification.

Application No. 14/072,231  
Amendment dated January 27, 2014

Docket No.: APIO-ID

**REMARKS**

In response to the Notice, Applicant selects option III(A)(2).

Please find the attached substitute specification. A marked version, which indicates changes thereto, and a clean version are attached.

The specification has been amended to correct numbering of the figures in the **BRIEF SUMMARY OF THE DRAWINGS** section.

The substitute specification includes no new matter.

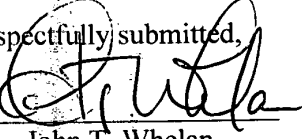
Please additionally find the attached Application Data Sheet under 37 C.F.R. § 1.76.

It is respectfully submitted, that the above-identified application is in condition for examination.

Dated: Monday, January 27, 2014

Respectfully submitted,

By

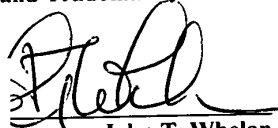
  
John T. Whelan

Reg. No. 32,448

Attorney For Applicant

***Certificate of Mailing***

I hereby certify that this correspondence is being mailed to the United States Patent and Trademark Office with sufficient first class postage on Monday, January 27, 2014.

  
John T. Whelan

Best Available Copy



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION FOR U.S. LETTERS PATENT

Title:

SYSTEM AND METHOD FOR IDENTIFYING VEHICLE BY UTILIZING  
DETECTED MAGNETIC FIELD

Inventor:

Sascha Simon



[0001] The present application claims priority from: U.S. Provisional Application No. 61/740,814 filed December 21, 2012; U.S. Provisional Application No. 61/740,831 filed December 21, 2012; U.S. Provisional Application No. 61/740,851 filed December 21, 2012; and U.S. Provisional Application No. 61/745,677 filed December 24, 2012, the entire disclosures of which are incorporated herein by reference.

### **BACKGROUND**

[0002] Vehicle telematics is the technology of sending, receiving and storing information to and from vehicles and is generally present (at least to a limited extent) in the automotive marketplace today. For example, both General Motors (through their OnStar offering) and Mercedes Benz (through their Tele-Aid and more recent mbrace system offering) have long offered connected-vehicle functionality to their customers. Both of these offerings make use of the data available on a vehicle's CAN bus, which is specified in the OBD-II vehicle diagnostics standard. For example, the deployment of an airbag, which suggests that the vehicle has been involved in a crash, may be detected by monitoring the CAN bus. In this event, a digital wireless telephony module that is embedded in the vehicle and connected to the vehicle's audio system (i.e., having voice connectivity) can initiate a phone call to a telematics service provider (TSP) to "report" the crash. Vehicle location may also be provided to the TSP using the vehicle's GPS functionality. Once the call is established, the TSP representative may attempt to communicate with the vehicle driver, using the vehicle's audio system, to assess the severity of the situation. Assistance may thus be dispatched by the TSP representative to the vehicle as appropriate.

[0003] Historically, these services were focused entirely on driver and passenger safety. These types of services have expanded since their initial roll-out, however, and now offer additional features to the driver, such as concierge services. The services, however, remain mainly focused on voice based driver to call center communication, with data services being only slowly introduced, hindered by low bandwidth communication modules, high cost and only partial availability on some model lines.

[0004] As a result, while generally functional, vehicle telematics services have experienced only limited commercial acceptance in the marketplace. There are several reasons for this. In addition to low speeds and bandwidth, most vehicle drivers (perhaps excluding the premium automotive market niche) are reluctant to pay extra for vehicle

### **Substitute Specification – Clean Version**

telematics services, either in the form of an upfront payment (i.e., more expensive vehicle) or a recurring (monthly/yearly) service fee. Moreover, from the vehicle manufacturer's perspective, the services require additional hardware to be embedded into the vehicle, resulting in extra costs on the order of \$250 to \$350 or more per vehicle which cannot be recouped. Thus, manufacturers have been slow to fully commit to or invest in the provision of vehicle telematics equipment in all vehicles.

[0005] There have been rudimentary attempts in the past to determine when a smartphone is in a moving vehicle. Wireless service provider AT&T, Sprint and Verizon, for example, offer a smartphone application that reacts in a specific manner to incoming text messages and voice calls when a phone is in what AT&T calls DriveMode™. With the AT&T DriveMode application, a wireless telephone is considered to be in "drive mode" when one of two conditions are met. First, the smartphone operator can manually turn on the application, i.e., she "tells" the application to enter drive mode. Alternatively, when the DriveMode application is in automatic on/off mode and the smartphone GPS sensor senses that the smartphone is travelling at greater than 25 miles per hour, the GPS sensor so informs the DriveMode application, the DriveMode application concludes that the smartphone is in a moving vehicle, and drive mode is entered.

[0006] Both of these paths to engaging the AT&T DriveMode application – the "manual" approach to entering drive mode and the "automatic" approach to entering drive mode -- are problematic. First, if the smartphone operator forgets or simply chooses not to launch the DriveMode application prior to driving the vehicle when the application is in manual mode then the application will not launch. Second, in automatic on/off mode AT&T's use of only the GPS sensor to determine when a smartphone is in a moving vehicle is problematic for a number of reasons. First, the speed threshold of the application is arbitrary, meaning that drive mode will not be detected/engaged at less than 25 mph. If the vehicle is stopped in traffic or at a traffic signal, for example, then the DriveMode application may inadvertently terminate. Second, and perhaps more importantly, AT&T's DriveMode application requires that the smartphone's GPS functionality be turned on at all times. Because the use of a smartphone's GPS sensor is extremely demanding to the battery resources of a smartphone, this requirement severely undermines the usefulness of AT&T's application. Thirdly this method does not differentiate between the type of vehicle that the phone is in, e.g. a bus, a taxi or a train and therefore allows no correlation between the owner of the phone and her

**Substitute Specification – Clean Version**

driving situation. For the classic embedded telematics devices to be replaced by smartphones it is important to correlate the driver and smartphone owner with her personal vehicle. Only then the smartphone can truly take the functional role of an embedded telematics device in a vehicle.

[0007] Accordingly, for at least the foregoing reasons there exists a need and it is an object of the present invention to provide an improved method and apparatus of determining the specific identity and type of vehicle a smartphone is in.

#### SUMMARY

[0008] The present invention provides an improved method and apparatus of determining the specific identity and type of vehicle a smartphone is in.

[0009] Various embodiments described herein are drawn to a device, for use with a database. The device includes a field-detecting component, an input component, an accessing component, a comparing component and an identifying component. The field-detecting component can detect at least one of an electric field, a magnetic field and an electro-magnetic field and can generate a detected field signature based on the detected one of an electric field, a magnetic field and an electro-magnetic field. The input component can input the detected field signature into the database. The accessing component can access the detected field signature from the database. The comparing component can generate a comparison signal. The identifying component can identify one of an item and a location based on the comparison signal. The field-detecting component can further detect a second one of an electric field, a magnetic field and an electro-magnetic field and can generate a second detected field signature based on the detected second one of an electric field, a magnetic field and an electro-magnetic field. The comparing component can generate the comparison signal based on a comparison of the detected field signature and the second detected field signature.

#### BRIEF SUMMARY OF THE DRAWINGS

[0010] The accompanying drawings, which are incorporated in and form a part of the specification, illustrate an exemplary embodiment of the present invention and, together with the description, serve to explain the principles of the invention. In the drawings:

[0011] FIGs. 1A-C illustrate a person and a vehicle at times  $t_1$ ,  $t_2$  and  $t_3$ , respectively;

#### Substitute Specification – Clean Version

[0012] FIGs. 2A-B illustrate a house and a building, respectively;

[0013] FIG. 3 illustrates an example method of identifying an item or a location in accordance with aspects of the present invention;

[0014] FIG. 4 illustrates an example device for identifying an item or a location in accordance with aspects of the present invention;

[0015] FIG. 5 illustrates an example method of registering an item or a location in accordance with aspects of the present invention;

[0016] FIG. 6 illustrates an example of measured magnetic fields associated with a vehicle in accordance with aspects of the present invention;

[0017] FIG. 7 illustrates another example of measured magnetic fields associated with a vehicle in accordance with aspects of the present invention;

[0018] FIG. 8 illustrates another example of measured magnetic fields associated with a vehicle in accordance with aspects of the present invention;

[0019] FIG. 9 illustrates an example of measured magnetic fields and of measured acceleration associated with a vehicle in accordance with aspects of the present invention;

[0020] FIG. 10 illustrates another example of measured magnetic fields and of measured acceleration associated with a vehicle in accordance with aspects of the present invention;

[0021] FIG. 11 illustrates another example of measured magnetic fields and of measured acceleration associated with a vehicle in accordance with aspects of the present invention;

[0022] FIG. 12 illustrates an example method of detecting an item or a location in accordance with aspects of the present invention; and

[0023] FIG. 13 illustrates an example method of verifying an item or a location in accordance with aspects of the present invention.

**Substitute Specification – Clean Version**

### DETAILED DESCRIPTION

[0024] Aspects of the present invention are drawn to a system and method for determining a specific item and/or location by utilizing field properties within and/or near the specific item and or location.

[0025] As used herein, the term "smartphone" includes cellular and/or satellite radiotelephone(s) with or without a display (text/graphical); Personal Communications System (PCS) terminal(s) that may combine a radiotelephone with data processing, facsimile and/or data communications capabilities; Personal Digital Assistant(s) (PDA) or other devices that can include a radio frequency transceiver and a pager, Internet/Intranet access, Web browser, organizer, calendar and/or a global positioning system (GPS) receiver; and/or conventional laptop (notebook) and/or palmtop (netbook) computer(s), tablet(s), or other appliance(s), which include a radio frequency transceiver. As used herein, the term "smartphone " also includes any other radiating user device that may have time-varying or fixed geographic coordinates and/or may be portable, transportable, installed in a vehicle (aeronautical, maritime, or land-based) and/or situated and/or configured to operate locally and/or in a distributed fashion over one or more location(s).

[0026] In one non-limiting example embodiment, a smartphone is used to measure a magnetic field associated with a vehicle to identify the vehicle. In another non-limiting example embodiment, a smartphone is used to measure a magnetic field associated with a house to identify the location of the user of the smartphone. These aspects will now be described in more detail with reference to **FIGs. 1A-2B**.

[0027] As shown in **FIG. 1A**, at time  $t_1$ , a magnetic field **106** is located near vehicle **102**. For purposes of discussion, person **104** is holding a device (not shown) in accordance with an aspect of the present invention. In this specific example, the device in accordance with an aspect of the present invention is embodied in a smartphone. In this specific example, the smartphone is able to detect magnetic field **106**.

[0028] As shown in **FIG. 1B**, at time  $t_2$ , the opening of door **108** affects the magnetic field located near vehicle **102**, as shown by field lines **110**. Again the smartphone is able to detect magnetic field shown by field lines **110**.

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[0029] As shown in **FIG. 1C**, at time  $t_3$ , the smartphone is not detecting the magnetic field outside of vehicle **102**.

[0030] In accordance with example aspects of the present invention, a smartphone carried by person **104** may identify vehicle **102** by aspects of magnetic field **102** or magnetic field **108**. Non-limiting detectable aspects of the magnetic fields include an instantaneous magnitude, an instantaneous field vector, a magnitude as a function over a period of time, a field vector as a function over a period of time and combinations thereof.

[0031] In accordance with other example aspects of the present invention, a smartphone carried by person **104** may identify vehicle **102** by aspects of a change of magnetic field **102** to magnetic field **108**. Non-limiting detectable aspects of the change magnetic fields include an instantaneous change in magnitude, an instantaneous change in field vector, a change in magnitude as a function over a period of time, a change in field vector as a function over a period of time and combinations thereof.

[0032] In addition to identifying an item, as discussed above with reference to **FIGs. 1A-1C**, aspects of the present invention may be used to identify a location.

[0033] As shown in **FIG. 2A**, at time  $t_4$ , a person **204** is entering a house **202**. A magnetic field **206** is located near house **202**. For purposes of discussion, person **204** is holding a device (not shown) in accordance with an aspect of the present invention. In this specific example, the device in accordance with an aspect of the present invention is embodied in a smartphone. In this specific example, the smartphone is able to detect magnetic field **106**.

[0034] As shown in **FIG. 2B**, at time  $t_5$ , person **204** is entering a building **208**. A magnetic field **210** is located near building **208**. Again the smartphone is able to detect magnetic field **210**.

[0035] In accordance with example aspects of the present invention, a smartphone carried by person **104** may identify whether person **204** is entering house **202** or building **208** by aspects of magnetic field **206** or magnetic field **210**.

[0036] A more detailed discussion of example working embodiment will now be discussed with additional reference to **FIGs. 3-13**.

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[0037] **FIG. 3** illustrates an example method **300** of identifying an item or a location in accordance with aspects of the present invention.

[0038] Method **300** starts (**S302**) and an item or location is registered (**S304**). For example, if a person would like to be able to identify their vehicle, the vehicle would be registered based on a field associated with the vehicle, whereas if a person would like to be able to identify a location such as their place of work, then the location would be registered based on a field associated with the vehicle. A more detailed discussion of registration will now be provided with additional reference to **FIGs. 4-11**.

[0039] **FIG. 4** illustrates an example device **402** for identifying an item or a location in accordance with aspects of the present invention.

[0040] **FIG. 4** includes a device **402**, a database **404**, a field **406** and a network **408**. In this example embodiment, device **402** and database **404** are distinct elements. However, in some embodiments, device **402** and database **404** may be a unitary device as indicated by dotted line **410**.

[0041] Device **402** includes a field-detecting component **412**, an input component **414**, an accessing component **416**, a comparing component **418**, an identifying component **420**, a parameter-detecting component **422**, a communication component **424**, a verification component **426** and a controlling component **428**.

[0042] In this example, field-detecting component **412**, input component **414**, accessing component **416**, comparing component **418**, identifying component **420**, parameter-detecting component **422**, communication component **424**, verification component **426** and controlling component **428** are illustrated as individual devices. However, in some embodiments, at least two of field-detecting component **412**, input component **414**, accessing component **416**, comparing component **418**, identifying component **420**, parameter-detecting component **422**, communication component **424**, verification component **426** and controlling component **428** may be combined as a unitary device. Further, in some embodiments, at least one of field-detecting component **412**, input component **414**, accessing component **416**, comparing component **418**, identifying component **420**, parameter-detecting component **422**, communication component **424**, verification component **426** and controlling component **428** may be implemented as a computer having tangible computer-readable media for carrying or

having computer-executable instructions or data structures stored thereon. Such tangible computer-readable media can be any available media that can be accessed by a general purpose or special purpose computer. Non-limiting examples of tangible computer-readable media include physical storage and/or memory media such as RAM, ROM, EEPROM, CD-ROM or other optical disk storage, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to carry or store desired program code means in the form of computer-executable instructions or data structures and which can be accessed by a general purpose or special purpose computer. For information transferred or provided over a network or another communications connection (either hardwired, wireless, or a combination of hardwired or wireless) to a computer, the computer may properly view the connection as a computer-readable medium. Thus, any such connection may be properly termed a computer-readable medium. Combinations of the above should also be included within the scope of computer-readable media.

[0043] Controlling component 428 is arranged to communicate with: field-detecting component 412 via a communication line 430; input component 414 via a communication line 432; accessing component 416 via a communication line 434; comparing component 418 via a communication line 436; identifying component 420 via a communication line 438; parameter-detecting component 422 via a communication line 440; communication component 424 via a communication line 442; and verification component 426 via a communication line 444. Controlling component 428 is operable to control each of field-detecting component 412, input component 414, accessing component 416, comparing component 418, identifying component 420, parameter-detecting component 422, communication component 424 and verification component 426.

[0044] Field-detecting component 412 is additionally arranged to detect field 406, to communicate with input component 414 via a communication line 446, to communicate with comparing component 418 via a communication line 448 and to communicate with parameter-detecting component 422 via a communication line 445. Field-detecting component 412 may be any known device or system that is operable to detect a field, non-limiting examples of which include an electric field, a magnetic field, and electro-magnetic field and combinations thereof. In some non-limiting example embodiments, field-detecting component 412 may detect the amplitude of a field at an instant of time. In some non-limiting example embodiments, field-detecting component 412 may detect a field vector at an

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instant of time. In some non-limiting example embodiments, field-detecting component **412** may detect the amplitude of a field as a function over a period of time. In some non-limiting example embodiments, field-detecting component **412** may detect a field vector as a function over a period of time. In some non-limiting example embodiments, field-detecting component **412** may detect a change in the amplitude of a field as a function over a period of time. In some non-limiting example embodiments, field-detecting component **412** may detect a change in a field vector as a function over a period of time.

[0045] Input component **414** is additionally arranged to communicate with database **404** via a communication line **450** and to communicate with verification component **426** via a communication line **452**. Input component **414** may be any known device or system that is operable to input data into database **404**. Non-limiting examples of input component **414** include a graphic user interface (GUI) having a user interactive touch screen or keypad.

[0046] Accessing component **416** is additionally arranged to communicate with database **404** via a communication line **454** and to communicate with comparing component **418** via a communication line **456**. Accessing component **416** may be any known device or system that access data from database **404**.

[0047] Comparing component **418** is additionally arranged to communicate with identifying component **420** via a communication line **458**. Comparing component **418** may be any known device or system that is operable to compare two inputs.

[0048] Parameter-detecting component **422** is additionally arranged to communicate with identifying component **422** via a communication line **460**. Parameter-detecting component **422** may be any known device or system that is operable to detect a parameter, non-limiting examples of which include velocity, acceleration, angular velocity, angular acceleration, geodetic position, sound, temperature, vibrations, pressure, biometrics, contents of surrounding atmosphere and combinations thereof. In some non-limiting example embodiments, parameter-detecting component **422** may detect the amplitude of a parameter at an instant of time. In some non-limiting example embodiments, parameter-detecting component **422** may detect a parameter vector at an instant of time. In some non-limiting example embodiments, parameter-detecting component **422** may detect the amplitude of a parameter as a function over a period of time. In some non-limiting example embodiments, parameter-detecting component **422** may detect a parameter vector as a function over a

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period of time. In some non-limiting example embodiments, parameter-detecting component 422 may detect a change in the amplitude of a parameter as a function over a period of time. In some non-limiting example embodiments, parameter-detecting component 422 may detect a change in a parameter vector as a function over a period of time.

[0049] Communication component 424 is additionally arranged to communicate with network 408 via a communication line 462. Communication component 424 may be any known device or system that is operable to communicate with network 408. Non-limiting examples of communication component include a wired and a wireless transmitter/receiver.

[0050] Verification component 426 may be any known device or system that is operable to provide a request for verification. Non-limiting examples of verification component 426 include a graphic user interface having a user interactive touch screen or keypad.

[0051] Communication lines 430, 432, 434, 436, 438, 440, 442, 444, 445, 446, 448, 450, 452, 454, 456, 458, 460 and 462 may be any known wired or wireless communication line.

[0052] Database 404 may be any known device or system that is operable to receive, store, organize and provide (upon a request) data, wherein the “database” refers to the data itself and supporting data structures. Non-limiting examples of database 404 include a memory hard-drive and a semiconductor memory.

[0053] Network 408 may be any known linkage of two or more communication devices. Non-limiting examples of database 408 include a wide-area network, a local-area network and the Internet.

[0054] For purposes of discussion, consider the example where a person is registering their vehicle. In some example embodiments, the vehicle may be registered based on an approach and entry into the vehicle as discussed above with reference to **FIGs. 1A-C**. In some example embodiments, the vehicle may be registered based upon fields detected while the person using the device is within the vehicle. For purposes of discussion, consider the example where a person is registering their vehicle while sitting in the vehicle. In some example embodiments, the registration may be performed based upon fields detected while the vehicle is in a specific mode of operation, non-limiting examples of which include starting up, driving forward, driving in reverse, stopped, accelerating, decelerating and combinations thereof. For purposes of discussion, consider the following example where a

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person is registering their vehicle based on the starting up of the vehicle. This example will now be described with additional reference to **FIG. 5**.

[0055] **FIG. 5** illustrates an example method **500** of registering an item or a location in accordance with aspects of the present invention.

[0056] Method **500** starts (**S502**) and a field is detected (**S504**). For example, returning to **FIG. 4**, field-detecting component **412** detects field **406**. For purposes of discussion, let field **406** be a magnetic field corresponding to the superposition of magnetic fields generated by all electronic and mechanical systems involved with the ignition of the vehicle. Some example detected field will now be described with greater detail with reference to **FIGs. 6-8**.

[0057] **FIG. 6** illustrates an example of measured magnetic fields associated with a specific vehicle in accordance with aspects of the present invention.

[0058] **FIG. 6** includes a graph **602**, a graph **604**, a graph **606** and a graph **608**, each of which share a common x-axis **610** in units of seconds. Graph **602** has a y-axis in units of  $\mu\text{T}$  and includes a function **612**. Graph **604** has a y-axis in units of  $\mu\text{T}$  and includes a function **614**. Graph **606** has a y-axis in units of  $\mu\text{T}$  and includes a function **616**. Graph **608** has a y-axis in units of  $\mu\text{T}$  and includes a function **618**.

[0059] Function **612** corresponds to the absolute value of the magnitude of a magnetic field vector (**B**) of the vehicle. Function **614** corresponds to the magnitude of **B** in a z-direction relative to field-detecting component **412**. Function **616** corresponds to the magnitude of **B** in a y-direction relative to field-detecting component **412**. Function **618** corresponds to the magnitude of **B** in an x-direction relative to field-detecting component **412**.

[0060] A sudden change in the magnetic field manifests as spike **620** in function **612**, as spike **622** in function **614**, as spike **624** in function **616** and as spike **626** in function **618**. This spike may be indicative of an event. For purposes of discussion, let this sudden change in the magnetic field correspond to the ignition of a particular vehicle. In this example therefore, the vehicle may have a signature based on functions **612**, **614**, **616** and **618**, having tell-tail spikes **620**, **622**, **624** and **626**, respectively. These functions may be easily distinguished from signatures based on different events, as will now be described with reference to **FIG. 7**.

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[0061] **FIG. 7** illustrates another example of measured magnetic fields associated with a second vehicle in accordance with aspects of the present invention.

[0062] **FIG. 7** includes a graph **702**, a graph **704**, a graph **706** and a graph **708**, each of which share a common x-axis **710** in units of seconds. Graph **702** has a y-axis in units of  $\mu\text{T}$  and includes a function **712**. Graph **704** has a y-axis in units of  $\mu\text{T}$  and includes a function **714**. Graph **706** has a y-axis in units of  $\mu\text{T}$  and includes a function **716**. Graph **708** has a y-axis in units of  $\mu\text{T}$  and includes a function **718**.

[0063] Function **712** corresponds to the absolute value of the magnitude of a **B** of the second vehicle. Function **714** corresponds to the magnitude of **B** in a z-direction relative to field-detecting component **412**. Function **716** corresponds to the magnitude of **B** in a y-direction relative to field-detecting component **412**. Function **718** corresponds to the magnitude of **B** in an x-direction relative to field-detecting component **412**.

[0064] By comparing the overall magnitudes of the detected magnetic fields between **FIG. 6** and **FIG. 7** it is clear that the fields are associated with two different vehicles. However, there are additional differences between the detected fields worth noting. A change in the magnetic field of **FIG. 7** manifests as a curve **720** in function **712**, as a curve **722** in function **714**, as a curve **724** in function **716** and as a spike **726** in function **718**. A commonality of each of these features is a rotation of the magnetic field, which may be indicative of an event. In this example, the relatively smooth transition of the magnetic field in more than one axis as shown in functions **714** and **716**, is indicative of a smooth movement of the detecting device within the detected magnetic field. For purposes of discussion, let this smooth change in the magnetic field correspond to the person, holding the device, entering a vehicle. Also noteworthy is a sudden change **728** in function **718**. This change which is detected in only one axis may be indicative of another event. For purposes of discussion, let this sudden change correspond to ignition of the vehicle. Therefore, in this example, the action of entering a specific vehicle and starting that specific vehicle may have a signature based on functions **712**, **714**, **716** and **718**.

[0065] **FIG. 8** illustrates another example of measured magnetic fields associated with a third vehicle in accordance with aspects of the present invention.

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[0066] FIG. 8 includes a graph 802, a graph 804, a graph 806 and a graph 808, each of which share a common x-axis 810 in units of seconds. Graph 802 has a y-axis in units of  $\mu\text{T}$  and includes a function 812. Graph 804 has a y-axis in units of  $\mu\text{T}$  and includes a function 814. Graph 806 has a y-axis in units of  $\mu\text{T}$  and includes a function 816. Graph 808 has a y-axis in units of  $\mu\text{T}$  and includes a function 818.

[0067] Function 812 corresponds to the absolute value of the magnitude of a B of the third vehicle. Function 814 corresponds to the magnitude of B in a z-direction relative to field-detecting component 412. Function 816 corresponds to the magnitude of B in a y-direction relative to field-detecting component 412. Function 818 corresponds to the magnitude of B in an x-direction relative to field-detecting component 412.

[0068] A sudden change in the magnetic field manifests as a curve 820 in function 812, as a spike 822 in function 814, as a spike 824 in function 816 and as a spike 826 in function 818. A commonality of each of these features is a brief rotation of the magnetic field, which may be indicative of an event. In this example, the very brief rotation of the magnetic field in more than one axis, is indicative of a rotation the detecting device within the detected magnetic field. For purposes of discussion, let this quick change in the magnetic field correspond to the person, holding the device, entering a vehicle. Also noteworthy is a small bump 828 in function 812, a small bump 830 in function 814 and a small bump 832 in function 816. This small bump, which is detected in only two axes may be indicative of another event. For purposes of discussion, let this change correspond to ignition of the vehicle. Therefore, in this example, the action of entering a specific vehicle and starting that specific vehicle may have a signature based on functions 812, 814, 816 and 818.

[0069] Returning to FIG. 5, once the field is detected (S504), a signature is generated (S506). In some embodiments, for example as shown in FIG. 4, field-detecting component 412 may generate a signature of the vehicle based any of functions 612, 614, 616, 618 of FIG. 6, and combinations thereof. In some embodiments, field-detecting component 412 may additionally process any of functions 612, 614, 616, 618 and combinations thereof to generate such a signature. Non-limiting examples of further processes include averaging, adding, subtracting, and transforming any of functions 612, 614, 616, 618 and combinations thereof.

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[0070] Returning to FIG. 5, once the signature is generated (S506), the signature is input into memory (S508). For example, as shown in FIG. 4, field-detecting component 412 provides the signature to input component 414 via communication line 446.

[0071] In an example embodiment, input component 414 includes a GUI that informs a user of device 402 that a signature has been generated. Input component 414 may additionally enable the user to input an association between an item or location and the generated signature. For example, input component 414 may display on a GUI a message such as “A signature was generated. To what item/location is the signature associated?” Input component 414 may then display an input prompt for the user to input, via the GUI, an item/location to be associated with the generated signature.

[0072] Input component 414 may then provide the signature, and the association to a specific item or location, to database 404 via communication line 450.

[0073] As discussed above, in some embodiments, database 404 is part of device 402, whereas in other embodiments, database 404 is separate from device 402. Data input and retrieval from database 404 may be faster when database 404 is part of device 402, as opposed to cases where database 404 is distinct from device 402. However, size may be a concern when designing device 402, particularly when device 402 is intended to be a handheld device such as a smartphone. As such, device 402 may be much smaller when database 404 is distinct from device 402, as opposed to cases where database 404 is part of device 402.

[0074] Consider an example embodiment, where database 404 is part of device 402. In such cases, input component 414 may enable a user to input signatures and the item/location associations, for a predetermined number of items/locations. In this manner, database 404 will only be used for device 402.

[0075] Now consider an example embodiment, where database 404 is separate from device 402. Further, let database 404 be much larger than the case where database 404 is part of device 402. Still further, let database 404 be accessible to other devices in accordance with aspects of the present invention. In such cases, input component 414 may enable a user to input signatures and the item/location associations, for a much larger predetermined number of items/locations. Further, in such cases, input component 414 may enable other users of

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similar devices to input signatures and the item/location associations, for even more items/locations.

[0076] An example embodiment may use the differentiating magnetic field properties between different vehicle types and makes to identify the different vehicle types and makes. Today's vehicles are fully equipped with electronic and mechanical actuators and switches, engine subsystems. All these subsystems are generating their own electromagnetic and magnetic fields and therefore will alter the overall three-dimensional properties and field strength fluctuations of the vehicle interior. Particularly the ignition of a vehicle generates a characteristic magnetic flux for every vehicle. Aspects of the present invention include a storing these field properties as signatures within database 404 through measurements in the near field within the vehicle interior for a reference group of make and models. As such, any user of a device may be able to identify a registered vehicle within database 404. Thus, through previously stored signatures and additional measurements, the present invention enables a library of vehicular electromagnetic signatures. This library may be augmented with additional measurements describing the electromagnetic signatures of different vehicles. This will be described in greater detail later with reference to FIG. 13.

[0077] At this point, method 500 stops (S510).

[0078] In the examples discussed above with respect to FIGs. 6-8, field-detecting component 412 is detecting magnetic fields as field vectors as functions over a period of time. The detected signals illustrated in FIGs. 6-8 are easily distinguishable from one another. Accordingly, the vehicles associated therewith, respectively, may additionally be easily distinguishable from one another.

[0079] Returning to FIG. 5, method 500 may involve the detection of additional parameters to associate with an item or location. Specifically, additional aspects of the present invention are drawn to a system and method for determining a specific item and/or location by utilizing: 1) field properties within and/or near the specific item and or location; and 2) additionally detected parameters. In one non-limiting example embodiment, a smartphone is used to measure a magnetic field associated with a vehicle, and to measure velocity and/acceleration whether the user of the smartphone is in an identified vehicle.

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[0080] For example, returning to **FIG. 4**, parameter-detecting component **422** may be used to detect another parameter for use in detecting the vehicle. For purposes of discussion, consider the example where a person is registering their vehicle based on the walking up to the vehicle, entering the vehicle and starting up of the vehicle, wherein parameter-detecting component **422** measured various accelerations of the device as it is being carried by the person. This example will now be described with additional reference to **FIGs. 9-11**.

[0081] **FIG. 9** illustrates an example of measured magnetic fields and of measured acceleration associated with the device being carried in accordance with aspects of the present invention.

[0082] **FIG. 9** includes graph **602**, graph **604**, graph **606** and graph **608**, in addition to a graph **902**, a graph **904**, a graph **906**, a graph **908**, a graph **910** and a graph **912**, each of which share a common x-axis **914** in units of seconds. **FIG. 9** additionally includes a line **916**. Graph **902** has a y-axis in units of  $m/s^2$  and includes a function **918**. Graph **904** has a y-axis in units of  $m/s^2$  and includes a function **920**. Graph **906** has a y-axis in units of  $m/s^2$  and includes a function **922**. Graph **908** has a y-axis in units of degrees and includes a function **924**. Graph **910** has a y-axis in units of degrees and includes a function **926**. Graph **912** has a y-axis in units of degrees and includes a function **928**.

[0083] Function **918** corresponds to the acceleration in a z-direction relative to parameter-detecting component **422**. Function **920** corresponds to the acceleration in a y-direction relative to parameter-detecting component **422**. Function **922** corresponds to the acceleration in an x-direction relative to parameter-detecting component **422**. Function **924** corresponds to the angular acceleration in a yaw direction relative to parameter-detecting component **422**. Function **926** corresponds to the angular acceleration in a pitch direction relative to parameter-detecting component **422**. Function **928** corresponds to the angular acceleration in a roll direction relative to parameter-detecting component **422**.

[0084] As noted, function **920**, the acceleration in the y-direction, changes dramatically. This corresponds to the up and down motion of a person walking. Further, a spike **930** corresponds to motion of the person sitting into the vehicle. A second spike **932** corresponds to the large vibration coincident with starting of the vehicle. As discussed above, spikes **620**, **622**, **624** and **626** correspond to the detected magnetic field associated with ignition of the vehicle. Now these two separate parameters may be analyzed together to more clearly

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identify an event. In this example, a person is walking to, entering and starting a vehicle. As shown in each of functions 918, 920 and 922, the dramatic variations in detected acceleration in each axis (after the vehicle has been started as evidenced by the spikes in the detected magnetic fields of functions 612, 614, 616 and 618) may be explained by way of the vibrations of the vehicle now that it is running. This is particularly telling by function 918, or the acceleration in the z-axis (toward the vehicle). As the person is walking toward the vehicle, the constant walking velocity registers as no change in acceleration in this axis. However, after the vehicle is started, which shows as spike 934 in function 918, acceleration changes in the z-axis as a result of the vehicle vibrating from the engine.

[0085] Functions 924, 926 and 928 are shown here as further non-limiting examples of additional parameters that may be detected for use to identify a vehicle or location. In this example however, it should be noted that functions 928 includes a spike 936. This spike in the “roll” rotational axis is indicative that the device is being rolled, which may correspond to the phone being in the user’s hand when entering the vehicle. This further supports the notion that a person is entering a vehicle. This evidence in conjunction with the magnetic and acceleration signatures may be used to accurately identify the vehicle.

[0086] The additionally detected parameter, in the above example of FIG. 9, reduces the likelihood of false positive identification of a vehicle with only a magnetic signature. In accordance with aspects of the present invention, the use of additional parameter signatures may provide evidence to correctly identify a vehicle – or if the case may be – correctly identify a location.

[0087] In some embodiments, parameter-detecting component 422 may generate an output associated with the vehicle based any of functions 918, 920, 922, 924, 926, 928 and combinations thereof. In some embodiments, parameter-detecting component 422 may additionally process any of functions 918, 920, 922, 924, 926, 928 and combinations thereof to generate such an output. Non-limiting examples of further processes include averaging, adding, subtracting, and transforming any of functions 918, 920, 922, 924, 926, 928 and combinations thereof. In any of these embodiments, field-detecting component 412 may then generate a signature of the vehicle based any of functions 612, 614, 616, 618 and combinations thereof and based on the output generated by parameter-detecting component 422.

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[0088] **FIG. 10** illustrates another example of measured magnetic fields and of measured acceleration associated with a vehicle in accordance with aspects of the present invention.

[0089] **FIG. 10** includes graph 702, graph 704, graph 706 and graph 708, in addition to a graph 1002, a graph 1004, a graph 1006, a graph 1008, a graph 1010 and a graph 1012, each of which share a common x-axis 1014 in units of seconds. **FIG. 10** additionally includes a line 1016. Graph 1002 has a y-axis in units of  $m/s^2$  and includes a function 1018. Graph 1004 has a y-axis in units of  $m/s^2$  and includes a function 1020. Graph 1006 has a y-axis in units of  $m/s^2$  and includes a function 1022. Graph 1008 has a y-axis in units of degrees and includes a function 1024. Graph 1010 has a y-axis in units of degrees and includes a function 1026. Graph 1012 has a y-axis in units of degrees and includes a function 1028.

[0090] Function 1018 corresponds to the acceleration in a z-direction relative to parameter-detecting component 422. Function 1020 corresponds to the acceleration in a y-direction relative to parameter-detecting component 422. Function 1022 corresponds to the acceleration in an x-direction relative to parameter-detecting component 422. Function 1024 corresponds to the angular acceleration in a yaw direction relative to parameter-detecting component 422. Function 1026 corresponds to the angular acceleration in a pitch direction relative to parameter-detecting component 422. Function 1028 corresponds to the angular acceleration in a roll direction relative to parameter-detecting component 422.

[0091] As discussed above with reference to **FIGs. 6-7**, by comparing the overall magnitudes of the detected magnetic fields between **FIG. 9** and **FIG. 10**, it is clear that the fields are associated with two different vehicles. However, there are additional differences between the detected parameters worth noting. As noted by functions 1018, 1020 and 1022, the acceleration changes very little until changes in the detected magnetic field as noted by 720, 724, 728 and 732. At this point in time, as evidenced by variations 1030, 1032 and 1034, the acceleration-detecting component is “jostled” in all three axes. This corresponds to the relatively constant motion of a person walking, followed by the person entering the vehicle. Furthermore, as noted by function 1024, 1026 and 1028 there is a generally constant yaw pitch and roll until the changes in the detected magnetic field as noted by 720, 724, 728 and 732. At this point in time, as evidenced by double variations 1036, 1038 and 1040, the rotation-detecting component is “spun” in all three axes. These signatures, in conjunction with the relatively low acceleration as noted in functions 1018, 1020 and 1022, may be

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explained by the device being carried in a purse, for example. In such a case, being carried in a purse would buffer changes in acceleration, which is reflected in the relatively calm functions 1018, 1020 and 1022. When the person enters the vehicle and the purse is spun around and placed in a seat, double variations 1036, 1038 and 1040 may result. This is further evidenced by the lack of acceleration or movement detected in any of functions 1018, 1020, 1022, 1024, 1026 and 1028 after entering the vehicle.

[0092] In some embodiments, parameter-detecting component 422 may generate an output associated with the vehicle based on any of functions 1018, 1020, 1022, 1024, 1026, 1028 and combinations thereof. In some embodiments, parameter-detecting component 422 may additionally process any of functions 1018, 1020, 1022, 1024, 1026, 1028 and combinations thereof to generate such an output. Non-limiting examples of further processes include averaging, adding, subtracting, and transforming any of functions 1018, 1020, 1022, 1024, 1026, 1028 and combinations thereof. In any of these embodiments, field-detecting component 412 may then generate a signature of the vehicle based on any of functions 612, 614, 616, 618 and combinations thereof and based on the output generated by parameter-detecting component 422.

[0093] FIG. 11 illustrates another example of measured magnetic fields and of measured acceleration associated with a vehicle in accordance with aspects of the present invention.

[0094] FIG. 11 includes graph 802, graph 804, graph 806 and graph 808, in addition to a graph 1102, a graph 1104, a graph 1106, a graph 1108, a graph 1110 and a graph 1112, each of which share a common x-axis 1114 in units of seconds. FIG. 11 additionally includes a line 1116. Graph 1102 has a y-axis in units of  $m/s^2$  and includes a function 1118. Graph 1104 has a y-axis in units of  $m/s^2$  and includes a function 1120. Graph 1106 has a y-axis in units of  $m/s^2$  and includes a function 1122. Graph 1108 has a y-axis in units of degrees and includes a function 1124. Graph 1110 has a y-axis in units of degrees and includes a function 1126. Graph 1112 has a y-axis in units of degrees and includes a function 1128.

[0095] Function 1118 corresponds to the acceleration in a z-direction relative to parameter-detecting component 422. Function 1120 corresponds to the acceleration in a y-direction relative to parameter-detecting component 422. Function 1122 corresponds to the acceleration in an x-direction relative to parameter-detecting component 422. Function 1124 corresponds to the angular acceleration in a yaw direction relative to parameter-detecting

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component 422. Function 1126 corresponds to the angular acceleration in a pitch direction relative to parameter-detecting component 422. Function 1128 corresponds to the angular acceleration in a roll direction relative to parameter-detecting component 422.

[0096] By comparing the overall magnitudes of the detected magnetic fields between FIGs. 9-11, it is clear that the fields are associated with different vehicles. However, there are additional differences between the detected parameters worth noting. As noted by fluctuations 1130, 1132 and 1134 of functions 1118, 1120 and 1122, respectively, the acceleration changes drastically in correspondence with changes in the detected magnetic field as noted by 820, 822, 824 and 826. As discussed above, with reference to FIG. 8, this corresponds to entry into the vehicle. Further, as noted by spikes 1136, 1138 and 1140 of functions 1118, 1120 and 1122, respectively, the acceleration changes drastically in correspondence with changes in the detected magnetic field as noted by 828, 830 and 832. As discussed above, with reference to FIG. 8, this ignition of the vehicle. At this point in time, as evidenced by spikes 1136, 1138 and 1140, the acceleration detecting component is “jostled” in all three axes.

[0097] Furthermore, as noted by function 1124, 1126 and 1128 there is a generally constant yaw pitch and roll until the changes in the detected magnetic field as noted by 820, 822, 824 and 826. At this point in time, as evidenced by changes 1142, 1144 and 1146, the rotation-detecting component is “spun” in all three axes as a result of the person entering the vehicle. Then the yaw pitch and roll remain constant for a period indicated by portions 1148, 1150 and 1152 of functions 1124, 1126 and 1128, respectively. These signatures may be explained by the user setting the device down into one position after the entering the vehicle. At this point in time, as evidenced by changes 1142, 1144 and 1146, the rotation-detecting component is “spun” in all three axes as a result of the person entering the vehicle. Then the yaw pitch and roll again change as indicated by portions 1154, 1156 and 1158 of functions 1124, 1126 and 1128, respectively. These signatures may be explained by the person moving the device.

[0098] In some embodiments, parameter-detecting component 422 may generate an output associated with the vehicle based any of functions 1118, 1120, 1122, 1124, 1126, 1128 and combinations thereof. In some embodiments, parameter-detecting component 422 may additionally process any of functions 1118, 1120, 1122, 1124, 1126, 1128 and combinations

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thereof to generate such an output. Non-limiting examples of further processes include averaging, adding, subtracting, and transforming any of functions 1118, 1120, 1122, 1124, 1126, 1128 and combinations thereof. In any of these embodiments, field-detecting component 412 may then generate a signature of the vehicle based any of functions 612, 614, 616, 618 and combinations thereof and based on the output generated by parameter-detecting component 422.

[0099] In the examples discussed above with respect to **FIGs. 9-11**, just as with the examples discussed above with respect to **FIGs. 6-8**, the detected magnetic signals are easily distinguishable from one another. Accordingly, the vehicles associated therewith, respectively, may additionally be easily distinguishable from one another. However, in situations where the magnetic field signatures may be somewhat similar, it may be more difficult for a device in accordance with aspects of the present invention to distinguish vehicles – solely on the detected magnetic (or electric or electro-magnetic) fields. As such, the use of further distinguishing with at least a second detected parameter may help distinguish the vehicles.

[00100] In the examples discussed above with respect to **FIGs. 9-11**, parameter-detecting component 422 is detecting acceleration vectors as functions over a period of time. The detected acceleration signals illustrated in **FIGs. 9-11** are easily distinguishable from one another. Accordingly, even if such vehicles had similar magnetic signatures, the vehicles associated with the detected acceleration signals, respectively, may additionally be easily distinguishable from one another.

[00101] The above discussed examples of **FIGs. 9-11** are merely provided for purposes of explanation and are not limiting. Clearly, any other type of detectable parameter may be used to additionally distinguish an item or location in accordance with aspects of the present invention.

[00102] It should be noted that the detected fields and parameters in the examples discussed above with reference to **FIGs. 6-11** are non-limiting examples. Each vehicle may have a distinct signature, just as each person may have a unique gait that will register a unique acceleration signature. An aspect of the present invention is the recording of a field signature, and in some cases an additional parameter signature, for future use to detect a vehicle or location.

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[00103] In an example embodiment, field-detecting component 412 may detect magnetic field vectors associated with the approach and entry into vehicle 102, for example as discussed above with reference to FIGs. 1A-C, whereas parameter-detecting component 422 may detect three dimensional acceleration associated with the gait of person 104, the motion of person 104 opening door 108 and the motion of person 104 sitting in vehicle 102. An overall signature may be generated based on the signatures generated from each of field-detecting component 412 and parameter-detecting component 422.

[00104] In another example embodiment, field-detecting component 412 may detect magnetic field vectors associated the inside of vehicle 102 while it is operating, whereas parameter-detecting component 422 may detect ambient noise associated with the running engine and road noise associated with vehicle 102 while it is operating. An overall signature may be generated based on the signatures generated from each of field-detecting component 412 and parameter-detecting component 422.

[00105] Returning to FIG. 3, after the item or location has been registered (S304), an item or location is detected (S306). For example, the next time the person approaches a vehicle, a device in accordance with aspects of the present invention would detect a field associated with the vehicle. Similarly, for example, the next time the person approaches a location, a device in accordance with aspects of the present invention would detect a field associated with the location. A more detailed discussion of registration will now be provided with additional reference to FIG.12.

[00106] FIG. 12 illustrates an example method 1200 of detecting an item or a location in accordance with aspects of the present invention.

[00107] Method 1200 starts (S1202) and a field is detected (S1204). This is the same as the field being detected (S504) as discussed above with reference to method 500. For example, returning to FIG. 4, field-detecting component 412 detects a new field. For purposes of discussion, let the new field be a magnetic field corresponding to the superposition of magnetic fields generated by all electronic and mechanical systems involved with the ignition of a vehicle.

[00108] Returning to FIG. 12, once the field is detected (S1204), a signature is generated (S1206). This is similar to the signature being generated (S506) as discussed

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above with reference to method 500. In some embodiments, for example as shown in FIG. 4, field-detecting component 412 may generate a signature of the vehicle based any of functions 612, 614, 616, 618 of FIG. 6, and combinations thereof. In some embodiments, field-detecting component 412 may additionally process any of functions 612, 614, 616, 618 and combinations thereof to generate such a signature. Non-limiting examples of further processes include averaging, adding, subtracting, and transforming any of functions 612, 614, 616, 618 and combinations thereof.

[00109] This second signature is provided to comparing component 418 via communication line 448.

[00110] At this point, method 1200 stops (S1208).

[00111] Returning to FIG. 3, after the item or location has been detected (S306), it is verified (S308). For example, a device in accordance with aspects of the present invention would determine whether the newly detected vehicle is the vehicle that was previously registered. Similarly, a device in accordance with aspects of the present invention would determine whether the newly detected location is the location that was previously registered. A more detailed discussion of registration will now be provided with additional reference to FIG.13.

[00112] FIG. 13 illustrates an example method 1300 of verifying an item or a location in accordance with aspects of the present invention.

[00113] Method 1300 starts (S1302) and the previously stored signature is accessed (S1304). For example, as shown in FIG. 4, access component 416 retrieves the previously-stored signature from database 404 via communication line 454. Access component 416 then provides the retrieved, previously-stored signature to comparator 418 via communication line 456.

[00114] Returning to FIG. 13, now that the previously stored signature has been accessed (S1304), the signatures are compared (S1306). For example, as shown in FIG. 4, comparator 418 compares the retrieved, previously stored signature as provided by access component 416 with the newly generated signature as provided by field-detecting component 412.

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[00115] Returning to **FIG. 13**, now that the signatures have been compared (**S1306**), the item/location may be identified (**S1308**). For example, as shown in **FIG. 4**, comparator **418** provides an output to identifying component **420** via communication line **458**. If the retrieved, previously stored signature as provided by access component **416** matches the newly generated signature as provided by field-detecting component **412**, then the newly detected item/location is the same item/location that was previously registered. In such a case, identifying component **420** may indicate that the newly detected item/location is the same item/location that was previously registered. If the retrieved, previously stored signature as provided by access component **416** does not match the newly generated signature as provided by field-detecting component **412**, then the newly detected item/location is not the same item/location that was previously registered. In such a case, identifying component **420** may indicate that the newly detected item/location is the same item/location that was previously registered.

[00116] At this point, method **1300** stops (**S1310**).

[00117] Returning to **FIG. 3**, after the item or location has been verified, the data is updated (**S310**). For example, in some embodiments, as shown in **FIG. 4**, comparator **418** may determine that the previously stored signature as provided by access component **416** does not exactly match the newly generated signature as provided by field-detecting component **412**, but the difference between the previously stored signature as provided by access component **416** does not exactly match the newly generated signature as provided by field-detecting component **412** is within a predetermined acceptable limit. In such cases, identifying component **420** may indicate that the newly detected item/location is still the same item/location that was previously registered. Further, comparator **418** may provide the newly generated signature as provided by field-detecting component **412** to access component **416** via communication line **456**. Access component **416** may then provide the newly generated signature to database **404** via communication line **454**.

[00118] In this manner, database **404** may be “taught” to accept variations of previously registered signatures. In some embodiments, an average of recognized signatures may be stored for future use. In some embodiments, a plurality of each recognized signature may be stored for future use.

[00119] Returning to **FIG. 3**, device **402** waits to detect a new field (**S306**).

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**[00120]** The example embodiments discussed above are drawn to identifying an item or location using fields associated therewith. Once identified, other functions may be available. For example, consider the situation wherein a device in accordance with aspects of the present invention is embodied in a smartphone. In such an example, once an item (e.g., a vehicle) or a location (e.g., a house) is identified, the smartphone may institute a suite of applications and turn off other applications. In a specific example embodiment, the identification of a vehicle may be used to place a smartphone in a “Vehicle Mode,” wherein the smartphone will operate in a particular manner because it is determined to be in a vehicle.

**[00121]** In accordance with aspects of the present invention discussed above, the sensors and functionalities of smartphones can be used to supplement or even replace the known vehicle-based techniques of vehicle telematics. More specifically, smartphone-to-smartphone (when both phones are in Vehicle Mode), smartphone-to-infrastructure and infrastructure-to-smartphone communications (again, when the smartphone is in Vehicle Mode) can provide drivers with a wide range of telematics services and features, while resulting in little or no additional cost to the vehicle driver (because she likely already has a smartphone) or the vehicle manufacturer (because it doesn’t have to provide the purchaser of the vehicle with a smartphone and also doesn’t have to embed costly vehicle telematics equipment in the vehicle). To be able to do so, however, the smartphone again has to be able to “know” that it is in Vehicle Mode and be able to determine in what vehicle it is. Ideally for various applications it is necessary to be able to determine if the smartphone is in the vehicle that is owned by the smartphone user. Aspects of the present invention enable a smartphone to know that it is in Vehicle Mode based on detected magnetic, electric, magneto-electric fields and combinations thereof.

**[00122]** Further in accordance with the present invention, a smartphone may utilize its magnetometer function to periodically measure the electromagnetic levels sensed at the smartphone’s current location. The smartphone uses its processing capabilities to try to map the periodic electromagnetic levels sensed by the smartphone with the vehicular electromagnetic signatures stored in library. If the periodic electromagnetic levels sensed by the smartphone match any of the specific vehicle signatures stored in the library, then the processor of the smartphone may generate and/or otherwise output a signal indicating that the smartphone is located in the specific vehicle, which in turn will be used by the Vehicle Mode detection method to trigger certain functions.

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**[00123]** The Vehicle Mode relevant sensor suite may be monitored at intervals depending on detected speed and location, for example, up to several times per second. The magneto metric sensor output may be monitored dependent on the accelerometer output as this will indicate a movement of the phone either within the vehicle environment or of the vehicle itself.

**[00124]** In the drawings and specification, there have been disclosed embodiments of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being set forth in the following claims.

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## CLAIMS

What is claimed as new and desired to be protected by Letters Patent of the United States is:

1. A device, for use with a database, said device comprising:
  - a field-detecting component operable to detect at least one of an electric field, a magnetic field and an electro-magnetic field and to generate a detected field signature based on the detected one of an electric field, a magnetic field and an electro-magnetic field;
  - an input component operable to input the detected field signature into the database;
  - an accessing component operable to access the detected field signature from the database;
  - a comparing component operable to generate a comparison signal; and
  - an identifying component operable to identify one of an item and a location based on the comparison signal,wherein said field-detecting component is further operable to detect a second one of an electric field, a magnetic field and an electro-magnetic field and to generate a second detected field signature based on the detected second one of an electric field, a magnetic field and an electro-magnetic field, and  
wherein said comparing component is operable to generate the comparison signal based on a comparison of the detected field signature and the second detected field signature.
2. The device of claim 1, wherein said field-detecting component is operable to detect the at least one of an electric field, a magnetic field and an electro-magnetic field as a function over a period of time.
3. The device of claim 1, further comprising:
  - a parameter-detecting component operable to detect a parameter and to generate a parameter signal based on the detected parameter,wherein said identifying component is operable to identify the one of an item and a location based additionally on the parameter signal.
4. The device of claim 3, wherein said parameter-detecting component is operable to detect, as the parameter, one of the group consisting of a velocity, acceleration, angular

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velocity, angular acceleration, geodetic position, sound, temperature, vibrations, pressure, biometrics, contents of surrounding atmosphere and combinations thereof.

5. The device of claim 1, further comprising a communication component operable to wirelessly communicate with a network.

6. The device of claim 1,  
wherein said field-detecting component is operable to detect a magnetic field,  
wherein said input component is further operable to input an association between a vehicle and the detected magnetic field,  
wherein said field-detecting component is further operable to detect a second magnetic field and to generate a second detected field signature based on the detected second magnetic field, and  
wherein said identifying component is further operable, based on the association, to identify the vehicle as the item.

7. The device of claim 6, further comprising:  
a verification component operable to provide a request for verification based on the comparison signal and the association,  
wherein said input component is further operable to input a verification based on the request for verification.

8. A method, for use with a database, said method comprising:  
detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field;  
generating, via the field-detecting component, a detected field signature based on the detected one of an electric field, a magnetic field and an electro-magnetic field;  
inputting, via an input component, the detected field signature into the database;  
accessing, via an accessing component, the detected field signature from the database;  
generating, via a comparing component, a comparison signal;  
identifying, via an identifying component, one of an item and a location based on the comparison signal;

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detecting, via the field-detecting component, a second one of an electric field, a magnetic field and an electro-magnetic field; and

generating, via the field-detecting component, a second detected field signature based on the detected second one of an electric field, a magnetic field and an electro-magnetic field,

wherein said generating a comparison signal comprises generating the comparison signal based on a comparison of the detected field signature and the second detected field signature.

9. The method of claim 8, wherein said detecting comprises detecting the at least one of an electric field, a magnetic field and an electro-magnetic field as a function over a period of time.

10. The method of claim 8, further comprising:

detecting, via a parameter-detecting component, a parameter; and

generating, via the parameter-detecting component, a parameter signal based on the detected parameter,

wherein said identifying comprises identifying the one of an item and a location based additionally on the parameter signal.

11. The method of claim 10, wherein said detecting a parameter comprises detecting, as the parameter, one of the group consisting of a velocity, acceleration, angular velocity, angular acceleration, geodetic position, sound, temperature, vibrations, pressure, biometrics, contents of surrounding atmosphere and combinations thereof.

12. The method of claim 8, further comprising wirelessly communicating, via a communication component, with a network.

13. The method of claim 8, further comprising:

inputting, via the input component is further operable to input an association; and

identifying, via the identifying component, a vehicle,

wherein said detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field comprises detecting detect a magnetic field,

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wherein said inputting an association comprises inputting an association between a vehicle and the detected magnetic field,

wherein said detecting a second one of an electric field, a magnetic field and an electro-magnetic field comprises detecting a second magnetic field,

wherein said generating a second detected field signature comprises generating a second detected field signature based on the detected second magnetic field, and

wherein said identifying a vehicle comprises identifying, based on the association, the vehicle as the item.

14. The method of claim 13, further comprising:

providing, via a verification component, operable to provide a request for verification based on the comparison signal and the association; and

inputting, via the input component, a verification based on the request for verification.

15. A non-transitory, tangible, computer-readable media having computer-readable instructions stored thereon, for use with a database, the computer-readable instructions being capable of being read by a computer and being capable of instructing the computer to perform the method comprising:

detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field;

generating, via the field-detecting component, a detected field signature based on the detected one of an electric field, a magnetic field and an electro-magnetic field;

inputting, via an input component, the detected field signature into the database;

accessing, via an accessing component, the detected field signature from the database;

generating, via a comparing component, a comparison signal;

identifying, via an identifying component, one of an item and a location based on the comparison signal;

detecting, via the field-detecting component, a second one of an electric field, a magnetic field and an electro-magnetic field; and

generating, via the field-detecting component, a second detected field signature based on the detected second one of an electric field, a magnetic field and an electro-magnetic field,

wherein said generating a comparison signal comprises generating the comparison signal based on a comparison of the detected field signature and the second detected field signature.

16. The non-transitory, tangible, computer-readable media of claim 15, wherein the computer-readable instructions are capable of instructing the computer to perform the method such that said detecting comprises detecting the at least one of an electric field, a magnetic field and an electro-magnetic field as a function over a period of time.

17. The non-transitory, tangible, computer-readable media of claim 15, the computer-readable instructions being capable of being read by a computer and being capable of instructing the computer to perform the method further comprising:

detecting, via a parameter-detecting component, a parameter; and

generating, via the parameter-detecting component, a parameter signal based on the detected parameter,

wherein said identifying comprises identifying the one of an item and a location based additionally on the parameter signal.

18. The non-transitory, tangible, computer-readable media of claim 17, wherein the computer-readable instructions are capable of instructing the computer to perform the method such that said detecting a parameter comprises detecting, as the parameter, one of the group consisting of a velocity, acceleration, angular velocity, angular acceleration, geodetic position, sound, temperature, vibrations, pressure, biometrics, contents of surrounding atmosphere and combinations thereof.

19. The non-transitory, tangible, computer-readable media of claim 15, the computer-readable instructions being capable of being read by a computer and being capable of instructing the computer to perform the method further comprising wirelessly communicating, via a communication component, with a network.

20. The non-transitory, tangible, computer-readable media of claim 15, the computer-readable instructions being capable of instructing the computer to perform the method further comprising:

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inputting, via the input component is further operable to input an association; and  
identifying, via the identifying component, a vehicle,  
wherein said detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field comprises detecting detect a magnetic field,  
wherein said inputting an association comprises inputting an association between a vehicle and the detected magnetic field,  
wherein said detecting a second one of an electric field, a magnetic field and an electro-magnetic field comprises detecting a second magnetic field,  
wherein said generating a second detected field signature comprises generating a second detected field signature based on the detected second magnetic field, and  
wherein said identifying a vehicle comprises identifying, based on the association, the vehicle as the item.

21. The non-transitory, tangible, computer-readable media of claim 20, the computer-readable instructions being capable of instructing the computer to perform the method further comprising:

providing, via a verification component, operable to provide a request for verification based on the comparison signal and the association; and

inputting, via the input component, a verification based on the request for verification.

22. A device, for use with a database having stored therein, at least one of a first plurality of signatures, a second plurality of signatures and a third plurality of signatures, the first plurality of signatures corresponding to a plurality of electric fields, respectively, the second plurality of signatures corresponding to a plurality of magnetic fields, respectively, the third plurality of signatures corresponding to a plurality of electro-magnetic fields, respectively, said device comprising:

an accessing component operable to access one of the first plurality of signatures, the second plurality of signatures and the third plurality of signatures from the database;

a field-detecting component operable to detect at least one of an electric field, a magnetic field and an electro-magnetic field and to generate a detected field signature based on the detected one of said fields;

a comparing component operable to generate a comparison signal; and

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an identifying component operable to identify one of an item and a location based on the comparison signal,

wherein, when said field-detecting component is operable to detect an electric field, said comparison component is operable to generate the comparison signal based on a comparison of the detected field signature and the first plurality of signatures,

wherein, when said field-detecting component is operable to detect a magnetic field, said comparison component is operable to generate the comparison signal based on a comparison of the detected field signature and the second plurality of signatures, and

wherein, when said field-detecting component is operable to detect an electro-magnetic field, said comparison component is operable to generate the comparison signal based on a comparison of the detected field signature and the third plurality of signatures.

23. The device of claim 22, wherein said field-detecting component is operable to detect the at least one of an electric field, a magnetic field and an electro-magnetic field as a function over a period of time.

24. The device of claim 22, further comprising:

a parameter-detecting component operable to detect a parameter and to generate a parameter signal based on the detected parameter,

wherein said identifying component is operable to identify the one of an item and a location based additionally on the parameter signal.

25. The device of claim 24, wherein said parameter-detecting component is operable to detect, as the parameter, one of the group consisting of a velocity, acceleration, angular velocity, angular acceleration, geodetic position, sound, temperature, vibrations, pressure, biometrics, contents of surrounding atmosphere and combinations thereof.

26. The device of claim 22, further comprising a communication component operable to wirelessly communicate with a network.

27. The device of claim 22,

wherein said field-detecting component is operable to detect a magnetic field,

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wherein said input component is further operable to input an association between a vehicle and the detected magnetic field,

wherein said field-detecting component is further operable to detect a second magnetic field and to generate a second detected field signature based on the detected second magnetic field, and

wherein said identifying component is further operable, based on the association, to identify the vehicle as the item.

28. The device of claim 27, further comprising:

a verification component operable to provide a request for verification based on the comparison signal and the association,

wherein said input component is further operable to input a verification based on the request for verification.

29. A method, for use with a database having stored therein, at least one of a first plurality of signatures, a second plurality of signatures and a third plurality of signatures, the first plurality of signatures corresponding to a plurality of electric fields, respectively, the second plurality of signatures corresponding to a plurality of magnetic fields, respectively, the third plurality of signatures corresponding to a plurality of electro-magnetic fields, respectively, said method comprising:

accessing, via an accessing component, one of the first plurality of signatures, the second plurality of signatures and the third plurality of signatures from the database;

detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field;

generating, via a field-detecting component, a detected field signature based on the detected one of an electric field, a magnetic field and an electro-magnetic field;

generating, via a comparing component, a comparison signal; and

identifying, via an identifying component, one of an item and a location based on the comparison signal,

wherein, when said detecting comprises detecting an electric field, said generating comprises generating the comparison signal based on a comparison of the detected field signature and the first plurality of signatures,

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wherein, when said detecting comprises detecting a magnetic field, said generating comprises generating the comparison signal based on a comparison of the detected field signature and the second plurality of signatures, and

wherein, when said detecting comprises detecting an electro-magnetic field, said generating comprises generating the comparison signal based on a comparison of the detected field signature and the third plurality of signatures.

30. The method of claim 29, wherein said detecting comprises detecting the at least one of an electric field, a magnetic field and an electro-magnetic field as a function over a period of time.

31. The method of claim 29, further comprising:

detecting, via a parameter-detecting component, a parameter; and

generating, via the parameter-detecting component, a parameter signal based on the detected parameter,

wherein said identifying comprises identifying the one of an item and a location based additionally on the parameter signal.

32. The method of claim 31, wherein said detecting a parameter comprises detecting, as the parameter, one of the group consisting of velocity, acceleration, angular velocity, angular acceleration, geodetic position, sound, temperature, vibrations, pressure, biometrics, contents of surrounding atmosphere and combinations thereof.

33. The method of claim 29, further comprising wirelessly communicating, via a communication component, with a network.

34. The method of claim 29, further comprising:

inputting, via the input component is further operable to input an association; and

identifying, via the identifying component, a vehicle,

wherein said detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field comprises detecting detect a magnetic field,

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wherein said inputting an association comprises inputting an association between a vehicle and the detected magnetic field,

wherein said detecting a second one of an electric field, a magnetic field and an electro-magnetic field comprises detecting a second magnetic field,

wherein said generating a second detected field signature comprises generating a second detected field signature based on the detected second magnetic field, and

wherein said identifying a vehicle comprises identifying, based on the association, the vehicle as the item.

35. The method of claim 34, further comprising:

providing, via a verification component, operable to provide a request for verification based on the comparison signal and the association; and

inputting, via the input component, a verification based on the request for verification.

36. A non-transitory, tangible, computer-readable media having computer-readable instructions stored thereon, for use with a database having stored therein, at least one of a first plurality of signatures, a second plurality of signatures and a third plurality of signatures, the first plurality of signatures corresponding to a plurality of electric fields, respectively, the second plurality of signatures corresponding to a plurality of magnetic fields, respectively, the third plurality of signatures corresponding to a plurality of electro-magnetic fields, respectively, the computer-readable instructions being capable of being read by a computer and being capable of instructing the computer to perform the method comprising:

accessing, via an accessing component, one of the first plurality of signatures, the second plurality of signatures and the third plurality of signatures from the database;

detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field;

generating, via a field-detecting component, a detected field signature based on the detected one of an electric field, a magnetic field and an electro-magnetic field;

generating, via a comparing component, a comparison signal; and

identifying, via an identifying component, one of an item and a location based on the comparison signal,

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wherein, when said detecting comprises detecting an electric field, said generating comprises generating the comparison signal based on a comparison of the detected field signature and the first plurality of signatures,

wherein, when said detecting comprises detecting a magnetic field, said generating comprises generating the comparison signal based on a comparison of the detected field signature and the second plurality of signatures, and

wherein, when said detecting comprises detecting an electro-magnetic field, said generating comprises generating the comparison signal based on a comparison of the detected field signature and the third plurality of signatures.

37. The non-transitory, tangible, computer-readable media of claim 36, wherein the computer-readable instructions are capable of instructing the computer to perform the method such that said detecting comprises detecting the at least one of an electric field, a magnetic field and an electro-magnetic field as a function over a period of time.

38. The non-transitory, tangible, computer-readable media of claim 36, the computer-readable instructions being capable of being read by a computer and being capable of instructing the computer to perform the method further comprising:

detecting, via a parameter-detecting component, a parameter; and

generating, via the parameter-detecting component, a parameter signal based on the detected parameter,

wherein said identifying comprises identifying the one of an item and a location based additionally on the parameter signal.

39. The non-transitory, tangible, computer-readable media of claim 38, wherein the computer-readable instructions are capable of instructing the computer to perform the method such that said detecting a parameter comprises detecting, as the parameter, one of the group consisting of velocity, acceleration, angular velocity, angular acceleration, geodetic position, sound, temperature, vibrations, pressure, biometrics, contents of surrounding atmosphere and combinations thereof.

40. The non-transitory, tangible, computer-readable media of claim 36, the computer-readable instructions being capable of being read by a computer and being capable of

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instructing the computer to perform the method further comprising wirelessly communicating, via a communication component, with a network.

41. The non-transitory, tangible, computer-readable media of claim 36, the computer-readable instructions being capable of instructing the computer to perform the method further comprising:

inputting, via the input component is further operable to input an association; and

identifying, via the identifying component, a vehicle,

wherein said detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field comprises detecting detect a magnetic field,

wherein said inputting an association comprises inputting an association between a vehicle and the detected magnetic field,

wherein said detecting a second one of an electric field, a magnetic field and an electro-magnetic field comprises detecting a second magnetic field,

wherein said generating a second detected field signature comprises generating a second detected field signature based on the detected second magnetic field, and

wherein said identifying a vehicle comprises identifying, based on the association, the vehicle as the item.

42. The non-transitory, tangible, computer-readable media of claim 41, the computer-readable instructions being capable of instructing the computer to perform the method further comprising:

providing, via a verification component, operable to provide a request for verification based on the comparison signal and the association; and

inputting, via the input component, a verification based on the request for verification.

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**ABSTRACT**

A device includes a field-detecting component, an input component, an accessing component, a comparing component and an identifying component. The field-detecting component can detect a field and generate a detected field signature based thereon. The input component can input the detected field signature into a database. The accessing component can access the detected field signature from the database. The comparing component can generate a comparison signal. The identifying component can identify item or location based on the comparison signal. The field-detecting component can further detect a second field and generate a second detected field signature based on the detected second field. The comparing component can generate the comparison signal based on a comparison of the detected field signature and the second detected field signature.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION FOR U.S. LETTERS PATENT

Title:

SYSTEM AND METHOD FOR IDENTIFYING VEHICLE BY UTILIZING  
DETECTED MAGNETIC FIELD

Inventor:

Sascha Simon

[0001] The present application claims priority from: U.S. Provisional Application No. 61/740,814 filed December 21, 2012; U.S. Provisional Application No. 61/740,831 filed December 21, 2012; U.S. Provisional Application No. 61/740,851 filed December 21, 2012; and U.S. Provisional Application No. 61/745,677 filed December 24, 2012, the entire disclosures of which are incorporated herein by reference.

### **BACKGROUND**

[0002] Vehicle telematics is the technology of sending, receiving and storing information to and from vehicles and is generally present (at least to a limited extent) in the automotive marketplace today. For example, both General Motors (through their OnStar offering) and Mercedes Benz (through their Tele-Aid and more recent mbrace system offering) have long offered connected-vehicle functionality to their customers. Both of these offerings make use of the data available on a vehicle's CAN bus, which is specified in the OBD-II vehicle diagnostics standard. For example, the deployment of an airbag, which suggests that the vehicle has been involved in a crash, may be detected by monitoring the CAN bus. In this event, a digital wireless telephony module that is embedded in the vehicle and connected to the vehicle's audio system (i.e., having voice connectivity) can initiate a phone call to a telematics service provider (TSP) to "report" the crash. Vehicle location may also be provided to the TSP using the vehicle's GPS functionality. Once the call is established, the TSP representative may attempt to communicate with the vehicle driver, using the vehicle's audio system, to assess the severity of the situation. Assistance may thus be dispatched by the TSP representative to the vehicle as appropriate.

[0003] Historically, these services were focused entirely on driver and passenger safety. These types of services have expanded since their initial roll-out, however, and now offer additional features to the driver, such as concierge services. The services, however, remain mainly focused on voice based driver to call center communication, with data services being only slowly introduced, hindered by low bandwidth communication modules, high cost and only partial availability on some model lines.

[0004] As a result, while generally functional, vehicle telematics services have experienced only limited commercial acceptance in the marketplace. There are several reasons for this. In addition to low speeds and bandwidth, most vehicle drivers (perhaps excluding the premium automotive market niche) are reluctant to pay extra for vehicle

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telematics services, either in the form of an upfront payment (i.e., more expensive vehicle) or a recurring (monthly/yearly) service fee. Moreover, from the vehicle manufacturer's perspective, the services require additional hardware to be embedded into the vehicle, resulting in extra costs on the order of \$250 to \$350 or more per vehicle which cannot be recouped. Thus, manufacturers have been slow to fully commit to or invest in the provision of vehicle telematics equipment in all vehicles.

[0005] There have been rudimentary attempts in the past to determine when a smartphone is in a moving vehicle. Wireless service provider AT&T, Sprint and Verizon, for example, offer a smartphone application that reacts in a specific manner to incoming text messages and voice calls when a phone is in what AT&T calls DriveMode™. With the AT&T DriveMode application, a wireless telephone is considered to be in "drive mode" when one of two conditions are met. First, the smartphone operator can manually turn on the application, i.e., she "tells" the application to enter drive mode. Alternatively, when the DriveMode application is in automatic on/off mode and the smartphone GPS sensor senses that the smartphone is travelling at greater than 25 miles per hour, the GPS sensor so informs the DriveMode application, the DriveMode application concludes that the smartphone is in a moving vehicle, and drive mode is entered.

[0006] Both of these paths to engaging the AT&T DriveMode application – the "manual" approach to entering drive mode and the "automatic" approach to entering drive mode -- are problematic. First, if the smartphone operator forgets or simply chooses not to launch the DriveMode application prior to driving the vehicle when the application is in manual mode then the application will not launch. Second, in automatic on/off mode AT&T's use of only the GPS sensor to determine when a smartphone is in a moving vehicle is problematic for a number of reasons. First, the speed threshold of the application is arbitrary, meaning that drive mode will not be detected/engaged at less than 25 mph. If the vehicle is stopped in traffic or at a traffic signal, for example, then the DriveMode application may inadvertently terminate. Second, and perhaps more importantly, AT&T's DriveMode application requires that the smartphone's GPS functionality be turned on at all times. Because the use of a smartphone's GPS sensor is extremely demanding to the battery resources of a smartphone, this requirement severely undermines the usefulness of AT&T's application. Thirdly this method does not differentiate between the type of vehicle that the phone is in, e.g. a bus, a taxi or a train and therefore allows no correlation between the owner of the phone and her

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driving situation. For the classic embedded telematics devices to be replaced by smartphones it is important to correlate the driver and smartphone owner with her personal vehicle. Only then the smartphone can truly take the functional role of an embedded telematics device in a vehicle.

[0007] Accordingly, for at least the foregoing reasons there exists a need and it is an object of the present invention to provide an improved method and apparatus of determining the specific identity and type of vehicle a smartphone is in.

#### SUMMARY

[0008] The present invention provides an improved method and apparatus of determining the specific identity and type of vehicle a smartphone is in.

[0009] Various embodiments described herein are drawn to a device, for use with a database. The device includes a field-detecting component, an input component, an accessing component, a comparing component and an identifying component. The field-detecting component can detect at least one of an electric field, a magnetic field and an electro-magnetic field and can generate a detected field signature based on the detected one of an electric field, a magnetic field and an electro-magnetic field. The input component can input the detected field signature into the database. The accessing component can access the detected field signature from the database. The comparing component can generate a comparison signal. The identifying component can identify one of an item and a location based on the comparison signal. The field-detecting component can further detect a second one of an electric field, a magnetic field and an electro-magnetic field and can generate a second detected field signature based on the detected second one of an electric field, a magnetic field and an electro-magnetic field. The comparing component can generate the comparison signal based on a comparison of the detected field signature and the second detected field signature.

#### BRIEF SUMMARY OF THE DRAWINGS

[0010] The accompanying drawings, which are incorporated in and form a part of the specification, illustrate an exemplary embodiment of the present invention and, together with the description, serve to explain the principles of the invention. In the drawings:

[0011] FIGs. 1A-C illustrate a person and a vehicle at times  $t_1$ ,  $t_2$  and  $t_3$ , respectively;

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[0012] FIGs. 2A-B illustrate a house and a building, respectively;

[0013] FIG. 43 illustrates an example method of identifying an item or a location in accordance with aspects of the present invention;

[0014] FIG. 54 illustrates an example device for identifying an item or a location in accordance with aspects of the present invention;

[0015] FIG. 65 illustrates an example method of registering an item or a location in accordance with aspects of the present invention;

[0016] FIG. 76 illustrates an example of measured magnetic fields associated with a vehicle in accordance with aspects of the present invention;

[0017] FIG. 87 illustrates another example of measured magnetic fields associated with a vehicle in accordance with aspects of the present invention;

[0018] FIG. 98 illustrates another example of measured magnetic fields associated with a vehicle in accordance with aspects of the present invention;

[0019] FIG. 409 illustrates an example of measured magnetic fields and of measured acceleration associated with a vehicle in accordance with aspects of the present invention;

[0020] FIG. 410 illustrates another example of measured magnetic fields and of measured acceleration associated with a vehicle in accordance with aspects of the present invention;

[0021] FIG. 421 illustrates another example of measured magnetic fields and of measured acceleration associated with a vehicle in accordance with aspects of the present invention;

[0022] FIG. 12 illustrates an example method of detecting an item or a location in accordance with aspects of the present invention; and

[0023] FIG. 413 illustrates an example method of verifying an item or a location in accordance with aspects of the present invention.

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### DETAILED DESCRIPTION

[0024] Aspects of the present invention are drawn to a system and method for determining a specific item and/or location by utilizing field properties within and/or near the specific item and or location.

[0025] As used herein, the term "smartphone" includes cellular and/or satellite radiotelephone(s) with or without a display (text/graphical); Personal Communications System (PCS) terminal(s) that may combine a radiotelephone with data processing, facsimile and/or data communications capabilities; Personal Digital Assistant(s) (PDA) or other devices that can include a radio frequency transceiver and a pager, Internet/Intranet access, Web browser, organizer, calendar and/or a global positioning system (GPS) receiver; and/or conventional laptop (notebook) and/or palmtop (netbook) computer(s), tablet(s), or other appliance(s), which include a radio frequency transceiver. As used herein, the term "smartphone " also includes any other radiating user device that may have time-varying or fixed geographic coordinates and/or may be portable, transportable, installed in a vehicle (aeronautical, maritime, or land-based) and/or situated and/or configured to operate locally and/or in a distributed fashion over one or more location(s).

[0026] In one non-limiting example embodiment, a smartphone is used to measure a magnetic field associated with a vehicle to identify the vehicle. In another non-limiting example embodiment, a smartphone is used to measure a magnetic field associated with a house to identify the location of the user of the smartphone. These aspects will now be described in more detail with reference to **FIGs. 1A-2B**.

[0027] As shown in **FIG. 1A**, at time  $t_1$ , a magnetic field **106** is located near vehicle **102**. For purposes of discussion, person **104** is holding a device (not shown) in accordance with an aspect of the present invention. In this specific example, the device in accordance with an aspect of the present invention is embodied in a smartphone. In this specific example, the smartphone is able to detect magnetic field **106**.

[0028] As shown in **FIG. 1B**, at time  $t_2$ , the opening of door **108** affects the magnetic field located near vehicle **102**, as shown by field lines **110**. Again the smartphone is able to detect magnetic field shown by field lines **110**.

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[0029] As shown in **FIG. 1C**, at time  $t_3$ , the smartphone is not detecting the magnetic field outside of vehicle **102**.

[0030] In accordance with example aspects of the present invention, a smartphone carried by person **104** may identify vehicle **102** by aspects of magnetic field **102** or magnetic field **108**. Non-limiting detectable aspects of the magnetic fields include an instantaneous magnitude, an instantaneous field vector, a magnitude as a function over a period of time, a field vector as a function over a period of time and combinations thereof.

[0031] In accordance with other example aspects of the present invention, a smartphone carried by person **104** may identify vehicle **102** by aspects of a change of magnetic field **102** to magnetic field **108**. Non-limiting detectable aspects of the change magnetic fields include an instantaneous change in magnitude, an instantaneous change in field vector, a change in magnitude as a function over a period of time, a change in field vector as a function over a period of time and combinations thereof.

[0032] In addition to identifying an item, as discussed above with reference to **FIGs. 1A-1C**, aspects of the present invention may be used to identify a location.

[0033] As shown in **FIG. 2A**, at time  $t_4$ , a person **204** is entering a house **202**. A magnetic field **206** is located near house **202**. For purposes of discussion, person **204** is holding a device (not shown) in accordance with an aspect of the present invention. In this specific example, the device in accordance with an aspect of the present invention is embodied in a smartphone. In this specific example, the smartphone is able to detect magnetic field **106**.

[0034] As shown in **FIG. 2B**, at time  $t_5$ , person **204** is entering a building **208**. A magnetic field **210** is located near building **208**. Again the smartphone is able to detect magnetic field **210**.

[0035] In accordance with example aspects of the present invention, a smartphone carried by person **104** may identify whether person **204** is entering house **202** or building **208** by aspects of magnetic field **206** or magnetic field **210**.

[0036] A more detailed discussion of example working embodiment will now be discussed with additional reference to **FIGs. 3-13**.

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[0037] **FIG. 3** illustrates an example method **300** of identifying an item or a location in accordance with aspects of the present invention.

[0038] Method **300** starts (**S302**) and an item or location is registered (**S304**). For example, if a person would like to be able to identify their vehicle, the vehicle would be registered based on a field associated with the vehicle, whereas if a person would like to be able to identify a location such as their place of work, then the location would be registered based on a field associated with the vehicle. A more detailed discussion of registration will now be provided with additional reference to **FIGs. 4-11**.

[0039] **FIG. 4** illustrates an example device **402** for identifying an item or a location in accordance with aspects of the present invention.

[0040] **FIG. 4** includes a device **402**, a database **404**, a field **406** and a network **408**. In this example embodiment, device **402** and database **404** are distinct elements. However, in some embodiments, device **402** and database **404** may be a unitary device as indicated by dotted line **410**.

[0041] Device **402** includes a field-detecting component **412**, an input component **414**, an accessing component **416**, a comparing component **418**, an identifying component **420**, a parameter-detecting component **422**, a communication component **424**, a verification component **426** and a controlling component **428**.

[0042] In this example, field-detecting component **412**, input component **414**, accessing component **416**, comparing component **418**, identifying component **420**, parameter-detecting component **422**, communication component **424**, verification component **426** and controlling component **428** are illustrated as individual devices. However, in some embodiments, at least two of field-detecting component **412**, input component **414**, accessing component **416**, comparing component **418**, identifying component **420**, parameter-detecting component **422**, communication component **424**, verification component **426** and controlling component **428** may be combined as a unitary device. Further, in some embodiments, at least one of field-detecting component **412**, input component **414**, accessing component **416**, comparing component **418**, identifying component **420**, parameter-detecting component **422**, communication component **424**, verification component **426** and controlling component **428** may be implemented as a computer having tangible computer-readable media for carrying or

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having computer-executable instructions or data structures stored thereon. Such tangible computer-readable media can be any available media that can be accessed by a general purpose or special purpose computer. Non-limiting examples of tangible computer-readable media include physical storage and/or memory media such as RAM, ROM, EEPROM, CD-ROM or other optical disk storage, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to carry or store desired program code means in the form of computer-executable instructions or data structures and which can be accessed by a general purpose or special purpose computer. For information transferred or provided over a network or another communications connection (either hardwired, wireless, or a combination of hardwired or wireless) to a computer, the computer may properly view the connection as a computer-readable medium. Thus, any such connection may be properly termed a computer-readable medium. Combinations of the above should also be included within the scope of computer-readable media.

[0043] Controlling component 428 is arranged to communicate with: field-detecting component 412 via a communication line 430; input component 414 via a communication line 432; accessing component 416 via a communication line 434; comparing component 418 via a communication line 436; identifying component 420 via a communication line 438; parameter-detecting component 422 via a communication line 440; communication component 424 via a communication line 442; and verification component 426 via a communication line 444. Controlling component 428 is operable to control each of field-detecting component 412, input component 414, accessing component 416, comparing component 418, identifying component 420, parameter-detecting component 422, communication component 424 and verification component 426.

[0044] Field-detecting component 412 is additionally arranged to detect field 406, to communicate with input component 414 via a communication line 446, to communicate with comparing component 418 via a communication line 448 and to communicate with parameter-detecting component 422 via a communication line 445. Field-detecting component 412 may be any known device or system that is operable to detect a field, non-limiting examples of which include an electric field, a magnetic field, and electro-magnetic field and combinations thereof. In some non-limiting example embodiments, field-detecting component 412 may detect the amplitude of a field at an instant of time. In some non-limiting example embodiments, field-detecting component 412 may detect a field vector at an

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instant of time. In some non-limiting example embodiments, field-detecting component **412** may detect the amplitude of a field as a function over a period of time. In some non-limiting example embodiments, field-detecting component **412** may detect a field vector as a function over a period of time. In some non-limiting example embodiments, field-detecting component **412** may detect a change in the amplitude of a field as a function over a period of time. In some non-limiting example embodiments, field-detecting component **412** may detect a change in a field vector as a function over a period of time.

[0045] Input component **414** is additionally arranged to communicate with database **404** via a communication line **450** and to communicate with verification component **426** via a communication line **452**. Input component **414** may be any known device or system that is operable to input data into database **404**. Non-limiting examples of input component **414** include a graphic user interface (GUI) having a user interactive touch screen or keypad.

[0046] Accessing component **416** is additionally arranged to communicate with database **404** via a communication line **454** and to communicate with comparing component **418** via a communication line **456**. Accessing component **416** may be any known device or system that access data from database **404**.

[0047] Comparing component **418** is additionally arranged to communicate with identifying component **420** via a communication line **458**. Comparing component **418** may be any known device or system that is operable to compare two inputs.

[0048] Parameter-detecting component **422** is additionally arranged to communicate with identifying component **422** via a communication line **460**. Parameter-detecting component **422** may be any known device or system that is operable to detect a parameter, non-limiting examples of which include velocity, acceleration, angular velocity, angular acceleration, geodetic position, sound, temperature, vibrations, pressure, biometrics, contents of surrounding atmosphere and combinations thereof. In some non-limiting example embodiments, parameter-detecting component **422** may detect the amplitude of a parameter at an instant of time. In some non-limiting example embodiments, parameter-detecting component **422** may detect a parameter vector at an instant of time. In some non-limiting example embodiments, parameter-detecting component **422** may detect the amplitude of a parameter as a function over a period of time. In some non-limiting example embodiments, parameter-detecting component **422** may detect a parameter vector as a function over a

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period of time. In some non-limiting example embodiments, parameter-detecting component 422 may detect a change in the amplitude of a parameter as a function over a period of time. In some non-limiting example embodiments, parameter-detecting component 422 may detect a change in a parameter vector as a function over a period of time.

[0049] Communication component 424 is additionally arranged to communicate with network 408 via a communication line 462. Communication component 424 may be any known device or system that is operable to communicate with network 408. Non-limiting examples of communication component include a wired and a wireless transmitter/receiver.

[0050] Verification component 426 may be any known device or system that is operable to provide a request for verification. Non-limiting examples of verification component 426 include a graphic user interface having a user interactive touch screen or keypad.

[0051] Communication lines 430, 432, 434, 436, 438, 440, 442, 444, 445, 446, 448, 450, 452, 454, 456, 458, 460 and 462 may be any known wired or wireless communication line.

[0052] Database 404 may be any known device or system that is operable to receive, store, organize and provide (upon a request) data, wherein the “database” refers to the data itself and supporting data structures. Non-limiting examples of database 404 include a memory hard-drive and a semiconductor memory.

[0053] Network 408 may be any known linkage of two or more communication devices. Non-limiting examples of database 408 include a wide-area network, a local-area network and the Internet.

[0054] For purposes of discussion, consider the example where a person is registering their vehicle. In some example embodiments, the vehicle may be registered based on an approach and entry into the vehicle as discussed above with reference to **FIGs. 1A-C**. In some example embodiments, the vehicle may be registered based upon fields detected while the person using the device is within the vehicle. For purposes of discussion, consider the example where a person is registering their vehicle while sitting in the vehicle. In some example embodiments, the registration may be performed based upon fields detected while the vehicle is in a specific mode of operation, non-limiting examples of which include starting up, driving forward, driving in reverse, stopped, accelerating, decelerating and combinations thereof. For purposes of discussion, consider the following example where a

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person is registering their vehicle based on the starting up of the vehicle. This example will now be described with additional reference to **FIG. 5**.

[0055] **FIG. 5** illustrates an example method **500** of registering an item or a location in accordance with aspects of the present invention.

[0056] Method **500** starts (**S502**) and a field is detected (**S504**). For example, returning to **FIG. 4**, field-detecting component **412** detects field **406**. For purposes of discussion, let field **406** be a magnetic field corresponding to the superposition of magnetic fields generated by all electronic and mechanical systems involved with the ignition of the vehicle. Some example detected field will now be described with greater detail with reference to **FIGs. 6-8**.

[0057] **FIG. 6** illustrates an example of measured magnetic fields associated with a specific vehicle in accordance with aspects of the present invention.

[0058] **FIG. 6** includes a graph **602**, a graph **604**, a graph **606** and a graph **608**, each of which share a common x-axis **610** in units of seconds. Graph **602** has a y-axis in units of  $\mu\text{T}$  and includes a function **612**. Graph **604** has a y-axis in units of  $\mu\text{T}$  and includes a function **614**. Graph **606** has a y-axis in units of  $\mu\text{T}$  and includes a function **616**. Graph **608** has a y-axis in units of  $\mu\text{T}$  and includes a function **618**.

[0059] Function **612** corresponds to the absolute value of the magnitude of a magnetic field vector (**B**) of the vehicle. Function **614** corresponds to the magnitude of **B** in a z-direction relative to field-detecting component **412**. Function **616** corresponds to the magnitude of **B** in a y-direction relative to field-detecting component **412**. Function **618** corresponds to the magnitude of **B** in an x-direction relative to field-detecting component **412**.

[0060] A sudden change in the magnetic field manifests as spike **620** in function **612**, as spike **622** in function **614**, as spike **624** in function **616** and as spike **626** in function **618**. This spike may be indicative of an event. For purposes of discussion, let this sudden change in the magnetic field correspond to the ignition of a particular vehicle. In this example therefore, the vehicle may have a signature based on functions **612**, **614**, **616** and **618**, having tell-tail spikes **620**, **622**, **624** and **626**, respectively. These functions may be easily distinguished from signatures based on different events, as will now be described with reference to **FIG. 7**.

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[0061] **FIG. 7** illustrates another example of measured magnetic fields associated with a second vehicle in accordance with aspects of the present invention.

[0062] **FIG. 7** includes a graph **702**, a graph **704**, a graph **706** and a graph **708**, each of which share a common x-axis **710** in units of seconds. Graph **702** has a y-axis in units of  $\mu\text{T}$  and includes a function **712**. Graph **704** has a y-axis in units of  $\mu\text{T}$  and includes a function **714**. Graph **706** has a y-axis in units of  $\mu\text{T}$  and includes a function **716**. Graph **708** has a y-axis in units of  $\mu\text{T}$  and includes a function **718**.

[0063] Function **712** corresponds to the absolute value of the magnitude of a **B** of the second vehicle. Function **714** corresponds to the magnitude of **B** in a z-direction relative to field-detecting component **412**. Function **716** corresponds to the magnitude of **B** in a y-direction relative to field-detecting component **412**. Function **718** corresponds to the magnitude of **B** in an x-direction relative to field-detecting component **412**.

[0064] By comparing the overall magnitudes of the detected magnetic fields between **FIG. 6** and **FIG. 7** it is clear that the fields are associated with two different vehicles. However, there are additional differences between the detected fields worth noting. A change in the magnetic field of **FIG. 7** manifests as a curve **720** in function **712**, as a curve **722** in function **714**, as a curve **724** in function **716** and as a spike **726** in function **718**. A commonality of each of these features is a rotation of the magnetic field, which may be indicative of an event. In this example, the relatively smooth transition of the magnetic field in more than one axis as shown in functions **714** and **716**, is indicative of a smooth movement of the detecting device within the detected magnetic field. For purposes of discussion, let this smooth change in the magnetic field correspond to the person, holding the device, entering a vehicle. Also noteworthy is a sudden change **728** in function **718**. This change which is detected in only one axis may be indicative of another event. For purposes of discussion, let this sudden change correspond to ignition of the vehicle. Therefore, in this example, the action of entering a specific vehicle and starting that specific vehicle may have a signature based on functions **712**, **714**, **716** and **718**.

[0065] **FIG. 8** illustrates another example of measured magnetic fields associated with a third vehicle in accordance with aspects of the present invention.

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[0066] FIG. 8 includes a graph 802, a graph 804, a graph 806 and a graph 808, each of which share a common x-axis 810 in units of seconds. Graph 802 has a y-axis in units of  $\mu\text{T}$  and includes a function 812. Graph 804 has a y-axis in units of  $\mu\text{T}$  and includes a function 814. Graph 806 has a y-axis in units of  $\mu\text{T}$  and includes a function 816. Graph 808 has a y-axis in units of  $\mu\text{T}$  and includes a function 818.

[0067] Function 812 corresponds to the absolute value of the magnitude of a B of the third vehicle. Function 814 corresponds to the magnitude of B in a z-direction relative to field-detecting component 412. Function 816 corresponds to the magnitude of B in a y-direction relative to field-detecting component 412. Function 818 corresponds to the magnitude of B in an x-direction relative to field-detecting component 412.

[0068] A sudden change in the magnetic field manifests as a curve 820 in function 812, as a spike 822 in function 814, as a spike 824 in function 816 and as a spike 826 in function 818. A commonality of each of these features is a brief rotation of the magnetic field, which may be indicative of an event. In this example, the very brief rotation of the magnetic field in more than one axis, is indicative of a rotation the detecting device within the detected magnetic field. For purposes of discussion, let this quick change in the magnetic field correspond to the person, holding the device, entering a vehicle. Also noteworthy is a small bump 828 in function 812, a small bump 830 in function 814 and a small bump 832 in function 816. This small bump, which is detected in only two axes may be indicative of another event. For purposes of discussion, let this change correspond to ignition of the vehicle. Therefore, in this example, the action of entering a specific vehicle and starting that specific vehicle may have a signature based on functions 812, 814, 816 and 818.

[0069] Returning to FIG. 5, once the field is detected (S504), a signature is generated (S506). In some embodiments, for example as shown in FIG. 4, field-detecting component 412 may generate a signature of the vehicle based any of functions 612, 614, 616, 618 of FIG. 6, and combinations thereof. In some embodiments, field-detecting component 412 may additionally process any of functions 612, 614, 616, 618 and combinations thereof to generate such a signature. Non-limiting examples of further processes include averaging, adding, subtracting, and transforming any of functions 612, 614, 616, 618 and combinations thereof.

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[0070] Returning to **FIG. 5**, once the signature is generated (**S506**), the signature is input into memory (**S508**). For example, as shown in **FIG. 4**, field-detecting component **412** provides the signature to input component **414** via communication line **446**.

[0071] In an example embodiment, input component **414** includes a GUI that informs a user of device **402** that a signature has been generated. Input component **414** may additionally enable the user to input an association between an item or location and the generated signature. For example, input component **414** may display on a GUI a message such as “A signature was generated. To what item/location is the signature associated?” Input component **414** may then display an input prompt for the user to input, via the GUI, an item/location to be associated with the generated signature.

[0072] Input component **414** may then provide the signature, and the association to a specific item or location, to database **404** via communication line **450**.

[0073] As discussed above, in some embodiments, database **404** is part of device **402**, whereas in other embodiments, database **404** is separate from device **402**. Data input and retrieval from database **404** may be faster when database **404** is part of device **402**, as opposed to cases where database **404** is distinct from device **402**. However, size may be a concern when designing device **402**, particularly when device **402** is intended to be a handheld device such as a smartphone. As such, device **402** may be much smaller when database **404** is distinct from device **402**, as opposed to cases where database **404** is part of device **402**.

[0074] Consider an example embodiment, where database **404** is part of device **402**. In such cases, input component **414** may enable a user to input signatures and the item/location associations, for a predetermined number of items/locations. In this manner, database **404** will only be used for device **402**.

[0075] Now consider an example embodiment, where database **404** is separate from device **402**. Further, let database **404** be much larger than the case where database **404** is part of device **402**. Still further, let database **404** be accessible to other devices in accordance with aspects of the present invention. In such cases, input component **414** may enable a user to input signatures and the item/location associations, for a much larger predetermined number of items/locations. Further, in such cases, input component **414** may enable other users of

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similar devices to input signatures and the item/location associations, for even more items/locations.

[0076] An example embodiment may use the differentiating magnetic field properties between different vehicle types and makes to identify the different vehicle types and makes. Today's vehicles are fully equipped with electronic and mechanical actuators and switches, engine subsystems. All these subsystems are generating their own electromagnetic and magnetic fields and therefore will alter the overall three-dimensional properties and field strength fluctuations of the vehicle interior. Particularly the ignition of a vehicle generates a characteristic magnetic flux for every vehicle. Aspects of the present invention include a storing these field properties as signatures within database 404 through measurements in the near field within the vehicle interior for a reference group of make and models. As such, any user of a device may be able to identify a registered vehicle within database 404. Thus, through previously stored signatures and additional measurements, the present invention enables a library of vehicular electromagnetic signatures. This library may be augmented with additional measurements describing the electromagnetic signatures of different vehicles. This will be described in greater detail later with reference to FIG. 13.

[0077] At this point, method 500 stops (S510).

[0078] In the examples discussed above with respect to FIGs. 6-8, field-detecting component 412 is detecting magnetic fields as field vectors as functions over a period of time. The detected signals illustrated in FIGs. 6-8 are easily distinguishable from one another. Accordingly, the vehicles associated therewith, respectively, may additionally be easily distinguishable from one another.

[0079] Returning to FIG. 5, method 500 may involve the detection of additional parameters to associate with an item or location. Specifically, additional aspects of the present invention are drawn to a system and method for determining a specific item and/or location by utilizing: 1) field properties within and/or near the specific item and or location; and 2) additionally detected parameters. In one non-limiting example embodiment, a smartphone is used to measure a magnetic field associated with a vehicle, and to measure velocity and/acceleration whether the user of the smartphone is in an identified vehicle.

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[0080] For example, returning to **FIG. 4**, parameter-detecting component **422** may be used to detect another parameter for use in detecting the vehicle. For purposes of discussion, consider the example where a person is registering their vehicle based on the walking up to the vehicle, entering the vehicle and starting up of the vehicle, wherein parameter-detecting component **422** measured various accelerations of the device as it is being carried by the person. This example will now be described with additional reference to **FIGs. 9-11**.

[0081] **FIG. 9** illustrates an example of measured magnetic fields and of measured acceleration associated with the device being carried in accordance with aspects of the present invention.

[0082] **FIG. 9** includes graph **602**, graph **604**, graph **606** and graph **608**, in addition to a graph **902**, a graph **904**, a graph **906**, a graph **908**, a graph **910** and a graph **912**, each of which share a common x-axis **914** in units of seconds. **FIG. 9** additionally includes a line **916**. Graph **902** has a y-axis in units of  $\text{m/s}^2$  and includes a function **918**. Graph **904** has a y-axis in units of  $\text{m/s}^2$  and includes a function **920**. Graph **906** has a y-axis in units of  $\text{m/s}^2$  and includes a function **922**. Graph **908** has a y-axis in units of degrees and includes a function **924**. Graph **910** has a y-axis in units of degrees and includes a function **926**. Graph **912** has a y-axis in units of degrees and includes a function **928**.

[0083] Function **918** corresponds to the acceleration in a z-direction relative to parameter-detecting component **422**. Function **920** corresponds to the acceleration in a y-direction relative to parameter-detecting component **422**. Function **922** corresponds to the acceleration in an x-direction relative to parameter-detecting component **422**. Function **924** corresponds to the angular acceleration in a yaw direction relative to parameter-detecting component **422**. Function **926** corresponds to the angular acceleration in a pitch direction relative to parameter-detecting component **422**. Function **928** corresponds to the angular acceleration in a roll direction relative to parameter-detecting component **422**.

[0084] As noted, function **920**, the acceleration in the y-direction, changes dramatically. This corresponds to the up and down motion of a person walking. Further, a spike **930** corresponds to motion of the person sitting into the vehicle. A second spike **932** corresponds to the large vibration coincident with starting of the vehicle. As discussed above, spikes **620**, **622**, **624** and **626** correspond to the detected magnetic field associated with ignition of the vehicle. Now these two separate parameters may be analyzed together to more clearly

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identify an event. In this example, a person is walking to, entering and starting a vehicle. As shown in each of functions **918**, **920** and **922**, the dramatic variations in detected acceleration in each axis (after the vehicle has been started as evidenced by the spikes in the detected magnetic fields of functions **612**, **614**, **616** and **618**) may be explained by way of the vibrations of the vehicle now that it is running. This is particularly telling by function **918**, or the acceleration in the z-axis (toward the vehicle). As the person is walking toward the vehicle, the constant walking velocity registers as no change in acceleration in this axis. However, after the vehicle is started, which shows as spike **934** in function **918**, acceleration changes in the z-axis as a result of the vehicle vibrating from the engine.

[0085] Functions **924**, **926** and **928** are shown here as further non-limiting examples of additional parameters that may be detected for use to identify a vehicle or location. In this example however, it should be noted that functions **928** includes a spike **936**. This spike in the “roll” rotational axis is indicative that the device is being rolled, which may correspond to the phone being in the user’s hand when entering the vehicle. This further supports the notion that a person is entering a vehicle. This evidence in conjunction with the magnetic and acceleration signatures may be used to accurately identify the vehicle.

[0086] The additionally detected parameter, in the above example of **FIG. 9**, reduces the likelihood of false positive identification of a vehicle with only a magnetic signature. In accordance with aspects of the present invention, the use of additional parameter signatures may provide evidence to correctly identify a vehicle – or if the case may be – correctly identify a location.

[0087] In some embodiments, parameter-detecting component **422** may generate an output associated with the vehicle based any of functions **918**, **920**, **922**, **924**, **926**, **928** and combinations thereof. In some embodiments, parameter-detecting component **422** may additionally process any of functions **918**, **920**, **922**, **924**, **926**, **928** and combinations thereof to generate such an output. Non-limiting examples of further processes include averaging, adding, subtracting, and transforming any of functions **918**, **920**, **922**, **924**, **926**, **928** and combinations thereof. In any of these embodiments, field-detecting component **412** may then generate a signature of the vehicle based any of functions **612**, **614**, **616**, **618** and combinations thereof and based on the output generated by parameter-detecting component **422**.

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[0088] **FIG. 10** illustrates another example of measured magnetic fields and of measured acceleration associated with a vehicle in accordance with aspects of the present invention.

[0089] **FIG. 10** includes graph 702, graph 704, graph 706 and graph 708, in addition to a graph 1002, a graph 1004, a graph 1006, a graph 1008, a graph 1010 and a graph 1012, each of which share a common x-axis 1014 in units of seconds. **FIG. 10** additionally includes a line 1016. Graph 1002 has a y-axis in units of  $\text{m/s}^2$  and includes a function 1018. Graph 1004 has a y-axis in units of  $\text{m/s}^2$  and includes a function 1020. Graph 1006 has a y-axis in units of  $\text{m/s}^2$  and includes a function 1022. Graph 1008 has a y-axis in units of degrees and includes a function 1024. Graph 1010 has a y-axis in units of degrees and includes a function 1026. Graph 1012 has a y-axis in units of degrees and includes a function 1028.

[0090] Function 1018 corresponds to the acceleration in a z-direction relative to parameter-detecting component 422. Function 1020 corresponds to the acceleration in a y-direction relative to parameter-detecting component 422. Function 1022 corresponds to the acceleration in an x-direction relative to parameter-detecting component 422. Function 1024 corresponds to the angular acceleration in a yaw direction relative to parameter-detecting component 422. Function 1026 corresponds to the angular acceleration in a pitch direction relative to parameter-detecting component 422. Function 1028 corresponds to the angular acceleration in a roll direction relative to parameter-detecting component 422.

[0091] As discussed above with reference to **FIGs. 6-7**, by comparing the overall magnitudes of the detected magnetic fields between **FIG. 9** and **FIG. 10**, it is clear that the fields are associated with two different vehicles. However, there are additional differences between the detected parameters worth noting. As noted by functions 1018, 1020 and 1022, the acceleration changes very little until changes in the detected magnetic field as noted by 720, 724, 728 and 732. At this point in time, as evidenced by variations 1030, 1032 and 1034, the acceleration-detecting component is “jostled” in all three axes. This corresponds to the relatively constant motion of a person walking, followed by the person entering the vehicle. Furthermore, as noted by function 1024, 1026 and 1028 there is a generally constant yaw pitch and roll until the changes in the detected magnetic field as noted by 720, 724, 728 and 732. At this point in time, as evidenced by double variations 1036, 1038 and 1040, the rotation-detecting component is “spun” in all three axes. These signatures, in conjunction with the relatively low acceleration as noted in functions 1018, 1020 and 1022, may be

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explained by the device being carried in a purse, for example. In such a case, being carried in a purse would buffer changes in acceleration, which is reflected in the relatively calm functions 1018, 1020 and 1022. When the person enters the vehicle and the purse is spun around and placed in a seat, double variations 1036, 1038 and 1040 may result. This is further evidenced by the lack of acceleration or movement detected in any of functions 1018, 1020, 1022, 1024, 1026 and 1028 after entering the vehicle.

[0092] In some embodiments, parameter-detecting component 422 may generate an output associated with the vehicle based on any of functions 1018, 1020, 1022, 1024, 1026, 1028 and combinations thereof. In some embodiments, parameter-detecting component 422 may additionally process any of functions 1018, 1020, 1022, 1024, 1026, 1028 and combinations thereof to generate such an output. Non-limiting examples of further processes include averaging, adding, subtracting, and transforming any of functions 1018, 1020, 1022, 1024, 1026, 1028 and combinations thereof. In any of these embodiments, field-detecting component 412 may then generate a signature of the vehicle based on any of functions 612, 614, 616, 618 and combinations thereof and based on the output generated by parameter-detecting component 422.

[0093] FIG. 11 illustrates another example of measured magnetic fields and of measured acceleration associated with a vehicle in accordance with aspects of the present invention.

[0094] FIG. 11 includes graph 802, graph 804, graph 806 and graph 808, in addition to a graph 1102, a graph 1104, a graph 1106, a graph 1108, a graph 1110 and a graph 1112, each of which share a common x-axis 1114 in units of seconds. FIG. 11 additionally includes a line 1116. Graph 1102 has a y-axis in units of  $m/s^2$  and includes a function 1118. Graph 1104 has a y-axis in units of  $m/s^2$  and includes a function 1120. Graph 1106 has a y-axis in units of  $m/s^2$  and includes a function 1122. Graph 1108 has a y-axis in units of degrees and includes a function 1124. Graph 1110 has a y-axis in units of degrees and includes a function 1126. Graph 1112 has a y-axis in units of degrees and includes a function 1128.

[0095] Function 1118 corresponds to the acceleration in a z-direction relative to parameter-detecting component 422. Function 1120 corresponds to the acceleration in a y-direction relative to parameter-detecting component 422. Function 1122 corresponds to the acceleration in an x-direction relative to parameter-detecting component 422. Function 1124 corresponds to the angular acceleration in a yaw direction relative to parameter-detecting

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component **422**. Function **1126** corresponds to the angular acceleration in a pitch direction relative to parameter-detecting component **422**. Function **1128** corresponds to the angular acceleration in a roll direction relative to parameter-detecting component **422**.

[0096] By comparing the overall magnitudes of the detected magnetic fields between **FIGs. 9-11**, it is clear that the fields are associated with different vehicles. However, there are additional differences between the detected parameters worth noting. As noted by fluctuations **1130**, **1132** and **1134** of functions **1118**, **1120** and **1122**, respectively, the acceleration changes drastically in correspondence with changes in the detected magnetic field as noted by **820**, **822**, **824** and **826**. As discussed above, with reference to **FIG. 8**, this corresponds to entry into the vehicle. Further, as noted by spikes **1136**, **1138** and **1140** of functions **1118**, **1120** and **1122**, respectively, the acceleration changes drastically in correspondence with changes in the detected magnetic field as noted by **828**, **830** and **832**. As discussed above, with reference to **FIG. 8**, this ignition of the vehicle. At this point in time, as evidenced by spikes **1136**, **1138** and **1140**, the acceleration detecting component is “jostled” in all three axes.

[0097] Furthermore, as noted by function **1124**, **1126** and **1128** there is a generally constant yaw pitch and roll until the changes in the detected magnetic field as noted by **820**, **822**, **824** and **826**. At this point in time, as evidenced by changes **1142**, **1144** and **1146**, the rotation-detecting component is “spun” in all three axes as a result of the person entering the vehicle. Then the yaw pitch and roll remain constant for a period indicated by portions **1148**, **1150** and **1152** of functions **1124**, **1126** and **1128**, respectively. These signatures may be explained by the user setting the device down into one position after the entering the vehicle. At this point in time, as evidenced by changes **1142**, **1144** and **1146**, the rotation-detecting component is “spun” in all three axes as a result of the person entering the vehicle. Then the yaw pitch and roll again change as indicated by portions **1154**, **1156** and **1158** of functions **1124**, **1126** and **1128**, respectively. These signatures may be explained by the person moving the device.

[0098] In some embodiments, parameter-detecting component **422** may generate an output associated with the vehicle based any of functions **1118**, **1120**, **1122**, **1124**, **1126**, **1128** and combinations thereof. In some embodiments, parameter-detecting component **422** may additionally process any of functions **1118**, **1120**, **1122**, **1124**, **1126**, **1128** and combinations

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thereof to generate such an output. Non-limiting examples of further processes include averaging, adding, subtracting, and transforming any of functions 1118, 1120, 1122, 1124, 1126, 1128 and combinations thereof. In any of these embodiments, field-detecting component 412 may then generate a signature of the vehicle based any of functions 612, 614, 616, 618 and combinations thereof and based on the output generated by parameter-detecting component 422.

[0099] In the examples discussed above with respect to **FIGs. 9-11**, just as with the examples discussed above with respect to **FIGs. 6-8**, the detected magnetic signals are easily distinguishable from one another. Accordingly, the vehicles associated therewith, respectively, may additionally be easily distinguishable from one another. However, in situations where the magnetic field signatures may be somewhat similar, it may be more difficult for a device in accordance with aspects of the present invention to distinguish vehicles – solely on the detected magnetic (or electric or electro-magnetic) fields. As such, the use of further distinguishing with at least a second detected parameter may help distinguish the vehicles.

[00100] In the examples discussed above with respect to **FIGs. 9-11**, parameter-detecting component 422 is detecting acceleration vectors as functions over a period of time. The detected acceleration signals illustrated in **FIGs. 9-11** are easily distinguishable from one another. Accordingly, even if such vehicles had similar magnetic signatures, the vehicles associated with the detected acceleration signals, respectively, may additionally be easily distinguishable from one another.

[00101] The above discussed examples of **FIGs. 9-11** are merely provided for purposes of explanation and are not limiting. Clearly, any other type of detectable parameter may be used to additionally distinguish an item or location in accordance with aspects of the present invention.

[00102] It should be noted that the detected fields and parameters in the examples discussed above with reference to **FIGs. 6-11** are non-limiting examples. Each vehicle may have a distinct signature, just as each person may have a unique gait that will register a unique acceleration signature. An aspect of the present invention is the recording of a field signature, and in some cases an additional parameter signature, for future use to detect a vehicle or location.

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[00103] In an example embodiment, field-detecting component 412 may detect magnetic field vectors associated with the approach and entry into vehicle 102, for example as discussed above with reference to FIGs. 1A-C, whereas parameter-detecting component 422 may detect three dimensional acceleration associated with the gait of person 104, the motion of person 104 opening door 108 and the motion of person 104 sitting in vehicle 102. An overall signature may be generated based on the signatures generated from each of field-detecting component 412 and parameter-detecting component 422.

[00104] In another example embodiment, field-detecting component 412 may detect magnetic field vectors associated the inside of vehicle 102 while it is operating, whereas parameter-detecting component 422 may detect ambient noise associated with the running engine and road noise associated with vehicle 102 while it is operating. An overall signature may be generated based on the signatures generated from each of field-detecting component 412 and parameter-detecting component 422.

[00105] Returning to FIG. 3, after the item or location has been registered (S304), an item or location is detected (S306). For example, the next time the person approaches a vehicle, a device in accordance with aspects of the present invention would detect a field associated with the vehicle. Similarly, for example, the next time the person approaches a location, a device in accordance with aspects of the present invention would detect a field associated with the location. A more detailed discussion of registration will now be provided with additional reference to FIG.12.

[00106] FIG. 12 illustrates an example method 1200 of detecting an item or a location in accordance with aspects of the present invention.

[00107] Method 1200 starts (S1202) and a field is detected (S1204). This is the same as the field being detected (S504) as discussed above with reference to method 500. For example, returning to FIG. 4, field-detecting component 412 detects a new field. For purposes of discussion, let the new field be a magnetic field corresponding to the superposition of magnetic fields generated by all electronic and mechanical systems involved with the ignition of a vehicle.

[00108] Returning to FIG. 12, once the field is detected (S1204), a signature is generated (S1206). This is similar to the signature being generated (S506) as discussed

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above with reference to method 500. In some embodiments, for example as shown in FIG. 4, field-detecting component 412 may generate a signature of the vehicle based any of functions 612, 614, 616, 618 of FIG. 6, and combinations thereof. In some embodiments, field-detecting component 412 may additionally process any of functions 612, 614, 616, 618 and combinations thereof to generate such a signature. Non-limiting examples of further processes include averaging, adding, subtracting, and transforming any of functions 612, 614, 616, 618 and combinations thereof.

[00109] This second signature is provided to comparing component 418 via communication line 448.

[00110] At this point, method 1200 stops (S1208).

[00111] Returning to FIG. 3, after the item or location has been detected (S306), it is verified (S308). For example, a device in accordance with aspects of the present invention would determine whether the newly detected vehicle is the vehicle that was previously registered. Similarly, a device in accordance with aspects of the present invention would determine whether the newly detected location is the location that was previously registered. A more detailed discussion of registration will now be provided with additional reference to FIG.13.

[00112] FIG. 13 illustrates an example method 1300 of verifying an item or a location in accordance with aspects of the present invention.

[00113] Method 1300 starts (S1302) and the previously stored signature is accessed (S1304). For example, as shown in FIG. 4, access component 416 retrieves the previously-stored signature from database 404 via communication line 454. Access component 416 then provides the retrieved, previously-stored signature to comparator 418 via communication line 456.

[00114] Returning to FIG. 13, now that the previously stored signature has been accessed (S1304), the signatures are compared (S1306). For example, as shown in FIG. 4, comparator 418 compares the retrieved, previously stored signature as provided by access component 416 with the newly generated signature as provided by field-detecting component 412.

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[00115] Returning to **FIG. 13**, now that the signatures have been compared (**S1306**), the item/location may be identified (**S1308**). For example, as shown in **FIG. 4**, comparator **418** provides an output to identifying component **420** via communication line **458**. If the retrieved, previously stored signature as provided by access component **416** matches the newly generated signature as provided by field-detecting component **412**, then the newly detected item/location is the same item/location that was previously registered. In such a case, identifying component **420** may indicate that the newly detected item/location is the same item/location that was previously registered. If the retrieved, previously stored signature as provided by access component **416** does not match the newly generated signature as provided by field-detecting component **412**, then the newly detected item/location is not the same item/location that was previously registered. In such a case, identifying component **420** may indicate that the newly detected item/location is the same item/location that was previously registered.

[00116] At this point, method **1300** stops (**S1310**).

[00117] Returning to **FIG. 3**, after the item or location has been verified, the data is updated (**S310**). For example, in some embodiments, as shown in **FIG. 4**, comparator **418** may determine that the previously stored signature as provided by access component **416** does not exactly match the newly generated signature as provided by field-detecting component **412**, but the difference between the previously stored signature as provided by access component **416** does not exactly match the newly generated signature as provided by field-detecting component **412** is within a predetermined acceptable limit. In such cases, identifying component **420** may indicate that the newly detected item/location is still the same item/location that was previously registered. Further, comparator **418** may provide the newly generated signature as provided by field-detecting component **412** to access component **416** via communication line **456**. Access component **416** may then provide the newly generated signature to database **404** via communication line **454**.

[00118] In this manner, database **404** may be “taught” to accept variations of previously registered signatures. In some embodiments, an average of recognized signatures may be stored for future use. In some embodiments, a plurality of each recognized signature may be stored for future use.

[00119] Returning to **FIG. 3**, device **402** waits to detect a new field (**S306**).

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[00120] The example embodiments discussed above are drawn to identifying an item or location using fields associated therewith. Once identified, other functions may be available. For example, consider the situation wherein a device in accordance with aspects of the present invention is embodied in a smartphone. In such an example, once an item (e.g., a vehicle) or a location (e.g., a house) is identified, the smartphone may institute a suite of applications and turn off other applications. In a specific example embodiment, the identification of a vehicle may be used to place a smartphone in a “Vehicle Mode,” wherein the smartphone will operate in a particular manner because it is determined to be in a vehicle.

[00121] In accordance with aspects of the present invention discussed above, the sensors and functionalities of smartphones can be used to supplement or even replace the known vehicle-based techniques of vehicle telematics. More specifically, smartphone-to-smartphone (when both phones are in Vehicle Mode), smartphone-to-infrastructure and infrastructure-to-smartphone communications (again, when the smartphone is in Vehicle Mode) can provide drivers with a wide range of telematics services and features, while resulting in little or no additional cost to the vehicle driver (because she likely already has a smartphone) or the vehicle manufacturer (because it doesn’t have to provide the purchaser of the vehicle with a smartphone and also doesn’t have to embed costly vehicle telematics equipment in the vehicle). To be able to do so, however, the smartphone again has to be able to “know” that it is in Vehicle Mode and be able to determine in what vehicle it is. Ideally for various applications it is necessary to be able to determine if the smartphone is in the vehicle that is owned by the smartphone user. Aspects of the present invention enable a smartphone to know that it is in Vehicle Mode based on detected magnetic, electric, magneto-electric fields and combinations thereof.

[00122] Further in accordance with the present invention, a smartphone may utilize its magnetometer function to periodically measure the electromagnetic levels sensed at the smartphone’s current location. The smartphone uses its processing capabilities to try to map the periodic electromagnetic levels sensed by the smartphone with the vehicular electromagnetic signatures stored in library. If the periodic electromagnetic levels sensed by the smartphone match any of the specific vehicle signatures stored in the library, then the processor of the smartphone may generate and/or otherwise output a signal indicating that the smartphone is located in the specific vehicle, which in turn will be used by the Vehicle Mode detection method to trigger certain functions.

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**[00123]** The Vehicle Mode relevant sensor suite may be monitored at intervals depending on detected speed and location, for example, up to several times per second. The magneto metric sensor output may be monitored dependent on the accelerometer output as this will indicate a movement of the phone either within the vehicle environment or of the vehicle itself.

**[00124]** In the drawings and specification, there have been disclosed embodiments of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being set forth in the following claims.

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## CLAIMS

What is claimed as new and desired to be protected by Letters Patent of the United States is:

1. A device, for use with a database, said device comprising:
  - a field-detecting component operable to detect at least one of an electric field, a magnetic field and an electro-magnetic field and to generate a detected field signature based on the detected one of an electric field, a magnetic field and an electro-magnetic field;
  - an input component operable to input the detected field signature into the database;
  - an accessing component operable to access the detected field signature from the database;
  - a comparing component operable to generate a comparison signal; and
  - an identifying component operable to identify one of an item and a location based on the comparison signal,wherein said field-detecting component is further operable to detect a second one of an electric field, a magnetic field and an electro-magnetic field and to generate a second detected field signature based on the detected second one of an electric field, a magnetic field and an electro-magnetic field, and  
wherein said comparing component is operable to generate the comparison signal based on a comparison of the detected field signature and the second detected field signature.
2. The device of claim 1, wherein said field-detecting component is operable to detect the at least one of an electric field, a magnetic field and an electro-magnetic field as a function over a period of time.
3. The device of claim 1, further comprising:
  - a parameter-detecting component operable to detect a parameter and to generate a parameter signal based on the detected parameter,wherein said identifying component is operable to identify the one of an item and a location based additionally on the parameter signal.
4. The device of claim 3, wherein said parameter-detecting component is operable to detect, as the parameter, one of the group consisting of a velocity, acceleration, angular

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velocity, angular acceleration, geodetic position, sound, temperature, vibrations, pressure, biometrics, contents of surrounding atmosphere and combinations thereof.

5. The device of claim 1, further comprising a communication component operable to wirelessly communicate with a network.

6. The device of claim 1,  
wherein said field-detecting component is operable to detect a magnetic field,  
wherein said input component is further operable to input an association between a vehicle and the detected magnetic field,  
wherein said field-detecting component is further operable to detect a second magnetic field and to generate a second detected field signature based on the detected second magnetic field, and  
wherein said identifying component is further operable, based on the association, to identify the vehicle as the item.

7. The device of claim 6, further comprising:  
a verification component operable to provide a request for verification based on the comparison signal and the association,  
wherein said input component is further operable to input a verification based on the request for verification.

8. A method, for use with a database, said method comprising:  
detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field;  
generating, via the field-detecting component, a detected field signature based on the detected one of an electric field, a magnetic field and an electro-magnetic field;  
inputting, via an input component, the detected field signature into the database;  
accessing, via an accessing component, the detected field signature from the database;  
generating, via a comparing component, a comparison signal;  
identifying, via an identifying component, one of an item and a location based on the comparison signal;

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detecting, via the field-detecting component, a second one of an electric field, a magnetic field and an electro-magnetic field; and

generating, via the field-detecting component, a second detected field signature based on the detected second one of an electric field, a magnetic field and an electro-magnetic field,

wherein said generating a comparison signal comprises generating the comparison signal based on a comparison of the detected field signature and the second detected field signature.

9. The method of claim 8, wherein said detecting comprises detecting the at least one of an electric field, a magnetic field and an electro-magnetic field as a function over a period of time.

10. The method of claim 8, further comprising:

detecting, via a parameter-detecting component, a parameter; and

generating, via the parameter-detecting component, a parameter signal based on the detected parameter,

wherein said identifying comprises identifying the one of an item and a location based additionally on the parameter signal.

11. The method of claim 10, wherein said detecting a parameter comprises detecting, as the parameter, one of the group consisting of a velocity, acceleration, angular velocity, angular acceleration, geodetic position, sound, temperature, vibrations, pressure, biometrics, contents of surrounding atmosphere and combinations thereof.

12. The method of claim 8, further comprising wirelessly communicating, via a communication component, with a network.

13. The method of claim 8, further comprising:

inputting, via the input component is further operable to input an association; and

identifying, via the identifying component, a vehicle,

wherein said detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field comprises detecting detect a magnetic field,

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wherein said inputting an association comprises inputting an association between a vehicle and the detected magnetic field,

wherein said detecting a second one of an electric field, a magnetic field and an electro-magnetic field comprises detecting a second magnetic field,

wherein said generating a second detected field signature comprises generating a second detected field signature based on the detected second magnetic field, and

wherein said identifying a vehicle comprises identifying, based on the association, the vehicle as the item.

14. The method of claim 13, further comprising:

providing, via a verification component, operable to provide a request for verification based on the comparison signal and the association; and

inputting, via the input component, a verification based on the request for verification.

15. A non-transitory, tangible, computer-readable media having computer-readable instructions stored thereon, for use with a database, the computer-readable instructions being capable of being read by a computer and being capable of instructing the computer to perform the method comprising:

detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field;

generating, via the field-detecting component, a detected field signature based on the detected one of an electric field, a magnetic field and an electro-magnetic field;

inputting, via an input component, the detected field signature into the database;

accessing, via an accessing component, the detected field signature from the database;

generating, via a comparing component, a comparison signal;

identifying, via an identifying component, one of an item and a location based on the comparison signal;

detecting, via the field-detecting component, a second one of an electric field, a magnetic field and an electro-magnetic field; and

generating, via the field-detecting component, a second detected field signature based on the detected second one of an electric field, a magnetic field and an electro-magnetic field,

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wherein said generating a comparison signal comprises generating the comparison signal based on a comparison of the detected field signature and the second detected field signature.

16. The non-transitory, tangible, computer-readable media of claim 15, wherein the computer-readable instructions are capable of instructing the computer to perform the method such that said detecting comprises detecting the at least one of an electric field, a magnetic field and an electro-magnetic field as a function over a period of time.

17. The non-transitory, tangible, computer-readable media of claim 15, the computer-readable instructions being capable of being read by a computer and being capable of instructing the computer to perform the method further comprising:

detecting, via a parameter-detecting component, a parameter; and

generating, via the parameter-detecting component, a parameter signal based on the detected parameter,

wherein said identifying comprises identifying the one of an item and a location based additionally on the parameter signal.

18. The non-transitory, tangible, computer-readable media of claim 17, wherein the computer-readable instructions are capable of instructing the computer to perform the method such that said detecting a parameter comprises detecting, as the parameter, one of the group consisting of a velocity, acceleration, angular velocity, angular acceleration, geodetic position, sound, temperature, vibrations, pressure, biometrics, contents of surrounding atmosphere and combinations thereof.

19. The non-transitory, tangible, computer-readable media of claim 15, the computer-readable instructions being capable of being read by a computer and being capable of instructing the computer to perform the method further comprising wirelessly communicating, via a communication component, with a network.

20. The non-transitory, tangible, computer-readable media of claim 15, the computer-readable instructions being capable of instructing the computer to perform the method further comprising:

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inputting, via the input component is further operable to input an association; and  
identifying, via the identifying component, a vehicle,  
wherein said detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field comprises detecting a magnetic field,  
wherein said inputting an association comprises inputting an association between a vehicle and the detected magnetic field,  
wherein said detecting a second one of an electric field, a magnetic field and an electro-magnetic field comprises detecting a second magnetic field,  
wherein said generating a second detected field signature comprises generating a second detected field signature based on the detected second magnetic field, and  
wherein said identifying a vehicle comprises identifying, based on the association, the vehicle as the item.

21. The non-transitory, tangible, computer-readable media of claim 20, the computer-readable instructions being capable of instructing the computer to perform the method further comprising:

providing, via a verification component, operable to provide a request for verification based on the comparison signal and the association; and  
inputting, via the input component, a verification based on the request for verification.

22. A device, for use with a database having stored therein, at least one of a first plurality of signatures, a second plurality of signatures and a third plurality of signatures, the first plurality of signatures corresponding to a plurality of electric fields, respectively, the second plurality of signatures corresponding to a plurality of magnetic fields, respectively, the third plurality of signatures corresponding to a plurality of electro-magnetic fields, respectively, said device comprising:

an accessing component operable to access one of the first plurality of signatures, the second plurality of signatures and the third plurality of signatures from the database;

a field-detecting component operable to detect at least one of an electric field, a magnetic field and an electro-magnetic field and to generate a detected field signature based on the detected one of said fields;

a comparing component operable to generate a comparison signal; and

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an identifying component operable to identify one of an item and a location based on the comparison signal,

wherein, when said field-detecting component is operable to detect an electric field, said comparison component is operable to generate the comparison signal based on a comparison of the detected field signature and the first plurality of signatures,

wherein, when said field-detecting component is operable to detect a magnetic field, said comparison component is operable to generate the comparison signal based on a comparison of the detected field signature and the second plurality of signatures, and

wherein, when said field-detecting component is operable to detect an electro-magnetic field, said comparison component is operable to generate the comparison signal based on a comparison of the detected field signature and the third plurality of signatures.

23. The device of claim 22, wherein said field-detecting component is operable to detect the at least one of an electric field, a magnetic field and an electro-magnetic field as a function over a period of time.

24. The device of claim 22, further comprising:

a parameter-detecting component operable to detect a parameter and to generate a parameter signal based on the detected parameter,

wherein said identifying component is operable to identify the one of an item and a location based additionally on the parameter signal.

25. The device of claim 24, wherein said parameter-detecting component is operable to detect, as the parameter, one of the group consisting of a velocity, acceleration, angular velocity, angular acceleration, geodetic position, sound, temperature, vibrations, pressure, biometrics, contents of surrounding atmosphere and combinations thereof.

26. The device of claim 22, further comprising a communication component operable to wirelessly communicate with a network.

27. The device of claim 22,

wherein said field-detecting component is operable to detect a magnetic field,

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wherein said input component is further operable to input an association between a vehicle and the detected magnetic field,

wherein said field-detecting component is further operable to detect a second magnetic field and to generate a second detected field signature based on the detected second magnetic field, and

wherein said identifying component is further operable, based on the association, to identify the vehicle as the item.

28. The device of claim 27, further comprising:

a verification component operable to provide a request for verification based on the comparison signal and the association,

wherein said input component is further operable to input a verification based on the request for verification.

29. A method, for use with a database having stored therein, at least one of a first plurality of signatures, a second plurality of signatures and a third plurality of signatures, the first plurality of signatures corresponding to a plurality of electric fields, respectively, the second plurality of signatures corresponding to a plurality of magnetic fields, respectively, the third plurality of signatures corresponding to a plurality of electro-magnetic fields, respectively, said method comprising:

accessing, via an accessing component, one of the first plurality of signatures, the second plurality of signatures and the third plurality of signatures from the database;

detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field;

generating, via a field-detecting component, a detected field signature based on the detected one of an electric field, a magnetic field and an electro-magnetic field;

generating, via a comparing component, a comparison signal; and

identifying, via an identifying component, one of an item and a location based on the comparison signal,

wherein, when said detecting comprises detecting an electric field, said generating comprises generating the comparison signal based on a comparison of the detected field signature and the first plurality of signatures,

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wherein, when said detecting comprises detecting a magnetic field, said generating comprises generating the comparison signal based on a comparison of the detected field signature and the second plurality of signatures, and

wherein, when said detecting comprises detecting an electro-magnetic field, said generating comprises generating the comparison signal based on a comparison of the detected field signature and the third plurality of signatures.

30. The method of claim 29, wherein said detecting comprises detecting the at least one of an electric field, a magnetic field and an electro-magnetic field as a function over a period of time.

31. The method of claim 29, further comprising:

detecting, via a parameter-detecting component, a parameter; and

generating, via the parameter-detecting component, a parameter signal based on the detected parameter,

wherein said identifying comprises identifying the one of an item and a location based additionally on the parameter signal.

32. The method of claim 31, wherein said detecting a parameter comprises detecting, as the parameter, one of the group consisting of velocity, acceleration, angular velocity, angular acceleration, geodetic position, sound, temperature, vibrations, pressure, biometrics, contents of surrounding atmosphere and combinations thereof.

33. The method of claim 29, further comprising wirelessly communicating, via a communication component, with a network.

34. The method of claim 29, further comprising:

inputting, via the input component is further operable to input an association; and

identifying, via the identifying component, a vehicle,

wherein said detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field comprises detecting detect a magnetic field,

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wherein said inputting an association comprises inputting an association between a vehicle and the detected magnetic field,

wherein said detecting a second one of an electric field, a magnetic field and an electro-magnetic field comprises detecting a second magnetic field,

wherein said generating a second detected field signature comprises generating a second detected field signature based on the detected second magnetic field, and

wherein said identifying a vehicle comprises identifying, based on the association, the vehicle as the item.

35. The method of claim 34, further comprising:

providing, via a verification component, operable to provide a request for verification based on the comparison signal and the association; and

inputting, via the input component, a verification based on the request for verification.

36. A non-transitory, tangible, computer-readable media having computer-readable instructions stored thereon, for use with a database having stored therein, at least one of a first plurality of signatures, a second plurality of signatures and a third plurality of signatures, the first plurality of signatures corresponding to a plurality of electric fields, respectively, the second plurality of signatures corresponding to a plurality of magnetic fields, respectively, the third plurality of signatures corresponding to a plurality of electro-magnetic fields, respectively, the computer-readable instructions being capable of being read by a computer and being capable of instructing the computer to perform the method comprising:

accessing, via an accessing component, one of the first plurality of signatures, the second plurality of signatures and the third plurality of signatures from the database;

detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field;

generating, via a field-detecting component, a detected field signature based on the detected one of an electric field, a magnetic field and an electro-magnetic field;

generating, via a comparing component, a comparison signal; and

identifying, via an identifying component, one of an item and a location based on the comparison signal,

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wherein, when said detecting comprises detecting an electric field, said generating comprises generating the comparison signal based on a comparison of the detected field signature and the first plurality of signatures,

wherein, when said detecting comprises detecting a magnetic field, said generating comprises generating the comparison signal based on a comparison of the detected field signature and the second plurality of signatures, and

wherein, when said detecting comprises detecting an electro-magnetic field, said generating comprises generating the comparison signal based on a comparison of the detected field signature and the third plurality of signatures.

37. The non-transitory, tangible, computer-readable media of claim 36, wherein the computer-readable instructions are capable of instructing the computer to perform the method such that said detecting comprises detecting the at least one of an electric field, a magnetic field and an electro-magnetic field as a function over a period of time.

38. The non-transitory, tangible, computer-readable media of claim 36, the computer-readable instructions being capable of being read by a computer and being capable of instructing the computer to perform the method further comprising:

detecting, via a parameter-detecting component, a parameter; and

generating, via the parameter-detecting component, a parameter signal based on the detected parameter,

wherein said identifying comprises identifying the one of an item and a location based additionally on the parameter signal.

39. The non-transitory, tangible, computer-readable media of claim 38, wherein the computer-readable instructions are capable of instructing the computer to perform the method such that said detecting a parameter comprises detecting, as the parameter, one of the group consisting of velocity, acceleration, angular velocity, angular acceleration, geodetic position, sound, temperature, vibrations, pressure, biometrics, contents of surrounding atmosphere and combinations thereof.

40. The non-transitory, tangible, computer-readable media of claim 36, the computer-readable instructions being capable of being read by a computer and being capable of

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instructing the computer to perform the method further comprising wirelessly communicating, via a communication component, with a network.

41. The non-transitory, tangible, computer-readable media of claim 36, the computer-readable instructions being capable of instructing the computer to perform the method further comprising:

inputting, via the input component is further operable to input an association; and

identifying, via the identifying component, a vehicle,

wherein said detecting, via a field-detecting component, at least one of an electric field, a magnetic field and an electro-magnetic field comprises detecting detect a magnetic field,

wherein said inputting an association comprises inputting an association between a vehicle and the detected magnetic field,

wherein said detecting a second one of an electric field, a magnetic field and an electro-magnetic field comprises detecting a second magnetic field,

wherein said generating a second detected field signature comprises generating a second detected field signature based on the detected second magnetic field, and

wherein said identifying a vehicle comprises identifying, based on the association, the vehicle as the item.

42. The non-transitory, tangible, computer-readable media of claim 41, the computer-readable instructions being capable of instructing the computer to perform the method further comprising:

providing, via a verification component, operable to provide a request for verification based on the comparison signal and the association; and

inputting, via the input component, a verification based on the request for verification.

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**ABSTRACT**

A device includes a field-detecting component, an input component, an accessing component, a comparing component and an identifying component. The field-detecting component can detect a field and generate a detected field signature based thereon. The input component can input the detected field signature into a database. The accessing component can access the detected field signature from the database. The comparing component can generate a comparison signal. The identifying component can identify item or location based on the comparison signal. The field-detecting component can further detect a second field and generate a second detected field signature based on the detected second field. The comparing component can generate the comparison signal based on a comparison of the detected field signature and the second detected field signature.

**Substitute Specification**

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| PATENT APPLICATION FEE DETERMINATION RECORD                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                               |                                  |       | Application or Docket Number       |               | Filing Date     |  | <input type="checkbox"/> To be Mailed |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------|------------------------------------|---------------|-----------------|--|---------------------------------------|--|
| Substitute for Form PTO-875                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                               |                                  |       | 14/072,231                         |               | 11/05/2013      |  |                                       |  |
| ENTITY: <input type="checkbox"/> LARGE <input checked="" type="checkbox"/> SMALL <input type="checkbox"/> MICRO                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                               |                                  |       |                                    |               |                 |  |                                       |  |
| APPLICATION AS FILED – PART I                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                               |                                  |       |                                    |               |                 |  |                                       |  |
| (Column 1)                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                               | (Column 2)                       |       |                                    |               |                 |  |                                       |  |
| FOR                                                                                                                                                                                                                                                                                                                                                                                                               | NUMBER FILED                                                                                                                                                                                                                  | NUMBER EXTRA                     |       | RATE (\$)                          |               | FEE (\$)        |  |                                       |  |
| <input checked="" type="checkbox"/> BASIC FEE<br>(37 CFR 1.16(a), (b), or (c))                                                                                                                                                                                                                                                                                                                                    | N/A                                                                                                                                                                                                                           | N/A                              |       | N/A                                |               | 140             |  |                                       |  |
| <input checked="" type="checkbox"/> SEARCH FEE<br>(37 CFR 1.16(k), (i), or (m))                                                                                                                                                                                                                                                                                                                                   | N/A                                                                                                                                                                                                                           | N/A                              |       | N/A                                |               | 300             |  |                                       |  |
| <input checked="" type="checkbox"/> EXAMINATION FEE<br>(37 CFR 1.16(o), (p), or (q))                                                                                                                                                                                                                                                                                                                              | N/A                                                                                                                                                                                                                           | N/A                              |       | N/A                                |               | 360             |  |                                       |  |
| TOTAL CLAIMS<br>(37 CFR 1.16(i))                                                                                                                                                                                                                                                                                                                                                                                  | 42 minus 20 =                                                                                                                                                                                                                 | * 22                             |       | x \$40 =                           |               | 880             |  |                                       |  |
| INDEPENDENT CLAIMS<br>(37 CFR 1.16(h))                                                                                                                                                                                                                                                                                                                                                                            | 6 minus 3 =                                                                                                                                                                                                                   | * 3                              |       | x \$210 =                          |               | 630             |  |                                       |  |
| <input type="checkbox"/> APPLICATION SIZE FEE<br>(37 CFR 1.16(s))                                                                                                                                                                                                                                                                                                                                                 | If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s). |                                  |       |                                    |               |                 |  |                                       |  |
| <input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                               |                                  |       |                                    |               |                 |  |                                       |  |
| * If the difference in column 1 is less than zero, enter "0" in column 2.                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                               |                                  |       | TOTAL                              |               | 2310            |  |                                       |  |
| APPLICATION AS AMENDED – PART II                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                               |                                  |       |                                    |               |                 |  |                                       |  |
| (Column 1)                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                               | (Column 2)                       |       | (Column 3)                         |               |                 |  |                                       |  |
| AMENDMENT                                                                                                                                                                                                                                                                                                                                                                                                         | 01/28/2014                                                                                                                                                                                                                    | CLAIMS REMAINING AFTER AMENDMENT |       | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | RATE (\$)       |  | ADDITIONAL FEE (\$)                   |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                   | Total (37 CFR 1.16(i))                                                                                                                                                                                                        | * 42                             | Minus | ** 42                              | = 0           | x \$40 =        |  | 0                                     |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                   | Independent (37 CFR 1.16(h))                                                                                                                                                                                                  | * 6                              | Minus | ***6                               | = 0           | x \$210 =       |  | 0                                     |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                   | <input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))                                                                                                                                                                |                                  |       |                                    |               |                 |  |                                       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                   | <input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))                                                                                                                                      |                                  |       |                                    |               |                 |  |                                       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                               |                                  |       |                                    |               | TOTAL ADD'L FEE |  | 0                                     |  |
| (Column 1)                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                               | (Column 2)                       |       | (Column 3)                         |               |                 |  |                                       |  |
| AMENDMENT                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                               | CLAIMS REMAINING AFTER AMENDMENT |       | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | RATE (\$)       |  | ADDITIONAL FEE (\$)                   |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                   | Total (37 CFR 1.16(i))                                                                                                                                                                                                        | *                                | Minus | **                                 | =             | x \$ =          |  |                                       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                   | Independent (37 CFR 1.16(h))                                                                                                                                                                                                  | *                                | Minus | ***                                | =             | x \$ =          |  |                                       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                   | <input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))                                                                                                                                                                |                                  |       |                                    |               |                 |  |                                       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                   | <input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))                                                                                                                                      |                                  |       |                                    |               |                 |  |                                       |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                               |                                  |       |                                    |               | TOTAL ADD'L FEE |  |                                       |  |
| * If the entry in column 1 is less than the entry in column 2, write "0" in column 3.<br>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".<br>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".<br>The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1. |                                                                                                                                                                                                                               |                                  |       |                                    |               |                 |  |                                       |  |

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**  
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| <b>PATENT APPLICATION FEE DETERMINATION RECORD</b><br>Substitute for Form PTO-875                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                               |                                    |                 |              |                    | Application or Docket Number<br>14/072,231 |                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-----------------|--------------|--------------------|--------------------------------------------|-----------------|
| <b>APPLICATION AS FILED - PART I</b>                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                               |                                    |                 |              |                    |                                            |                 |
| (Column 1)                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                               | (Column 2)                         |                 | SMALL ENTITY |                    | OTHER THAN SMALL ENTITY                    |                 |
| FOR                                                                                                                                                                                                                                                                                                                                                                                                        | NUMBER FILED                                                                                                                                                                                                                  | NUMBER EXTRA                       | RATE(\$)        | FEE(\$)      |                    | RATE(\$)                                   | FEE(\$)         |
| BASIC FEE<br><small>(37 CFR 1.16(a), (b), or (c))</small>                                                                                                                                                                                                                                                                                                                                                  | N/A                                                                                                                                                                                                                           | N/A                                | N/A             | 70           |                    | N/A                                        |                 |
| SEARCH FEE<br><small>(37 CFR 1.16(k), (l), or (m))</small>                                                                                                                                                                                                                                                                                                                                                 | N/A                                                                                                                                                                                                                           | N/A                                | N/A             | 300          |                    | N/A                                        |                 |
| EXAMINATION FEE<br><small>(37 CFR 1.16(o), (p), or (q))</small>                                                                                                                                                                                                                                                                                                                                            | N/A                                                                                                                                                                                                                           | N/A                                | N/A             | 360          |                    | N/A                                        |                 |
| TOTAL CLAIMS<br><small>(37 CFR 1.16(j))</small>                                                                                                                                                                                                                                                                                                                                                            | 42                                                                                                                                                                                                                            | minus 20 =<br>* 22                 | x 40 =          | 880          | OR                 |                                            |                 |
| INDEPENDENT CLAIMS<br><small>(37 CFR 1.16(h))</small>                                                                                                                                                                                                                                                                                                                                                      | 6                                                                                                                                                                                                                             | minus 3 =<br>* 3                   | x 210 =         | 630          |                    |                                            |                 |
| APPLICATION SIZE FEE<br><small>(37 CFR 1.16(s))</small>                                                                                                                                                                                                                                                                                                                                                    | If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s). |                                    |                 | 0.00         |                    |                                            |                 |
| MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                               |                                    |                 | 0.00         |                    |                                            |                 |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                               |                                    | TOTAL           | 2240         |                    | TOTAL                                      |                 |
| * If the difference in column 1 is less than zero, enter "0" in column 2.                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                               |                                    |                 |              |                    |                                            |                 |
| <b>APPLICATION AS AMENDED - PART II</b>                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                               |                                    |                 |              |                    |                                            |                 |
| (Column 1)                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                               | (Column 2)                         |                 | (Column 3)   |                    | SMALL ENTITY                               |                 |
| AMENDMENT A                                                                                                                                                                                                                                                                                                                                                                                                | CLAIMS REMAINING AFTER AMENDMENT                                                                                                                                                                                              | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA   | RATE(\$)     | ADDITIONAL FEE(\$) |                                            | RATE(\$)        |
|                                                                                                                                                                                                                                                                                                                                                                                                            | Total<br><small>(37 CFR 1.16(i))</small>                                                                                                                                                                                      | *                                  | Minus<br>**     | =            | x                  | =                                          | OR              |
|                                                                                                                                                                                                                                                                                                                                                                                                            | Independent<br><small>(37 CFR 1.16(h))</small>                                                                                                                                                                                | *                                  | Minus<br>***    | =            | x                  | =                                          | OR              |
|                                                                                                                                                                                                                                                                                                                                                                                                            | Application Size Fee (37 CFR 1.16(s))                                                                                                                                                                                         |                                    |                 |              |                    |                                            | OR              |
|                                                                                                                                                                                                                                                                                                                                                                                                            | FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))                                                                                                                                                               |                                    |                 |              |                    |                                            | OR              |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                               |                                    | TOTAL ADD'L FEE |              |                    | OR                                         | TOTAL ADD'L FEE |
| (Column 1)                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                               | (Column 2)                         |                 | (Column 3)   |                    | SMALL ENTITY                               |                 |
| AMENDMENT B                                                                                                                                                                                                                                                                                                                                                                                                | CLAIMS REMAINING AFTER AMENDMENT                                                                                                                                                                                              | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA   | RATE(\$)     | ADDITIONAL FEE(\$) |                                            | RATE(\$)        |
|                                                                                                                                                                                                                                                                                                                                                                                                            | Total<br><small>(37 CFR 1.16(i))</small>                                                                                                                                                                                      | *                                  | Minus<br>**     | =            | x                  | =                                          | OR              |
|                                                                                                                                                                                                                                                                                                                                                                                                            | Independent<br><small>(37 CFR 1.16(h))</small>                                                                                                                                                                                | *                                  | Minus<br>***    | =            | x                  | =                                          | OR              |
|                                                                                                                                                                                                                                                                                                                                                                                                            | Application Size Fee (37 CFR 1.16(s))                                                                                                                                                                                         |                                    |                 |              |                    |                                            | OR              |
|                                                                                                                                                                                                                                                                                                                                                                                                            | FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))                                                                                                                                                               |                                    |                 |              |                    |                                            | OR              |
|                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                               |                                    | TOTAL ADD'L FEE |              |                    | OR                                         | TOTAL ADD'L FEE |
| * If the entry in column 1 is less than the entry in column 2, write "0" in column 3.<br>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".<br>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".<br>The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1. |                                                                                                                                                                                                                               |                                    |                 |              |                    |                                            |                 |



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| APPLICATION<br>NUMBER | FILING or<br>371(c) DATE | GRP ART<br>UNIT | FIL FEE REC'D | ATTY. DOCKET NO | TOT CLAIMS | IND CLAIMS |
|-----------------------|--------------------------|-----------------|---------------|-----------------|------------|------------|
| 14/072,231            | 11/05/2013               | 2858            | 2240          | APIO-ID         | 42         | 6          |

CONFIRMATION NO. 1942

## UPDATED FILING RECEIPT



OC000000066498478

54671

The Law Office of John T. Whelan, LLC  
2315 Hallowing Point Road  
Prince Frederick, MD 20678

Date Mailed: 02/12/2014

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

### Inventor(s)

Sascha Simon, Warwick, NY;

### Applicant(s)

Sascha Simon, Warwick, NY;

### Power of Attorney: None

### Domestic Priority data as claimed by applicant

This appln claims benefit of 61/740,814 12/21/2012  
and claims benefit of 61/740,831 12/21/2012  
and claims benefit of 61/740,851 12/21/2012  
and claims benefit of 61/745,677 12/24/2012

**Foreign Applications** for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

*Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.*

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The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/072,231**

**Projected Publication Date:** 06/26/2014

**Non-Publication Request:** No

**Early Publication Request:** No

**\*\* SMALL ENTITY \*\***

**Title**

System and Method for Identifying Vehicle by Utilizing Detected Magnetic Field

**Preliminary Class**

324

**Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications:** No

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| APPLICATION NUMBER | FILING OR 371(C) DATE | FIRST NAMED APPLICANT | ATTY. DOCKET NO./TITLE |
|--------------------|-----------------------|-----------------------|------------------------|
| 14/072,231         | 11/05/2013            | Sascha Simon          | APIO-ID                |

**CONFIRMATION NO. 1942**

## PUBLICATION NOTICE

54671

The Law Office of John T. Whelan, LLC  
2315 Hallowing Point Road  
Prince Frederick, MD 20678



\*OC000000069314478\*

**Title:**System and Method for Identifying Vehicle by Utilizing Detected Magnetic Field

**Publication No.**US-2014-0180615-A1

**Publication Date:**06/26/2014

## NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

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Sheet 1 of 3

**Complete if Known**

|                        |                     |
|------------------------|---------------------|
| Application Number     | 14/072,231          |
| Filing Date            | 11/05/2013          |
| First Named Inventor   | Sascha Simon        |
| Art Unit               | 2857                |
| Examiner Name          | Schechter, Andrew M |
| Attorney Docket Number | APIO-ID             |

**U. S. PATENT DOCUMENTS**

| Examiner Initials* | Cite No.† | Document Number              | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines, Where<br>Relevant Passages or Relevant<br>Figures Appear |
|--------------------|-----------|------------------------------|--------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------|
|                    |           | Number-Kind Code‡ (if known) |                                |                                                    |                                                                                 |
|                    | AA        | US- 2008/0203814 A1          | 08/28/2008                     | Kamiya, Shinji                                     |                                                                                 |
|                    | AB        | US- 2009/0037056 A1          | 02/05/2009                     | Erb, Yannick                                       |                                                                                 |
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|                    | AD        | US- 5,785,347 A              | 07/28/1998                     | Adolph et al.                                      |                                                                                 |
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|                    | AP        | US- 2014/0180563 A1          | 06/26/14                       | Simon, Sascha                                      |                                                                                 |
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|                    | AS        | US- 2014/0179353 A1          | 06/26/14                       | Simon, Sascha                                      |                                                                                 |

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| Examiner Initials* | Cite No.† | Foreign Patent Document                      | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines, Where<br>Relevant Passages or Relevant<br>Figures Appear | T‡ |
|--------------------|-----------|----------------------------------------------|--------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------|----|
|                    |           | Country Code‡ Number * Kind Code‡ (if known) |                                |                                                    |                                                                                 |    |
|                    | AT        | JP 2007-183865 A                             | 07/19/2007                     | Denso Corp.                                        |                                                                                 |    |
|                    | AU        | WO 03-095276 A1                              | 11/20/2003                     | Cotty et al.                                       |                                                                                 |    |
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|                    | AW        | EP 0461888 A2                                | 12/18/1991                     | Exxon Research                                     |                                                                                 |    |
|                    | AX        | JP 2009-177758 A                             | 08/06/2009                     | Takashi, Takashima                                 |                                                                                 |    |

|                    |  |                 |  |
|--------------------|--|-----------------|--|
| Examiner Signature |  | Date Considered |  |
|--------------------|--|-----------------|--|

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**INFORMATION DISCLOSURE  
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Sheet 2 of 3**Complete if Known**

|                        |                     |
|------------------------|---------------------|
| Application Number     | 14/072,231          |
| Filing Date            | 11/05/2013          |
| First Named Inventor   | Sascha Simon        |
| Art Unit               | 2857                |
| Examiner Name          | Schechter, Andrew M |
| Attorney Docket Number | APIO-ID             |

**U. S. PATENT DOCUMENTS**

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|--------------------|-----------------------|--------------------------------------------|--------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------|
|                    |                       | Number-Kind Code <sup>2,3</sup> (if known) |                                |                                                    |                                                                                 |
|                    | AY                    | US- 6,411,250 B1                           | 06-2002                        | Oswald et al.                                      |                                                                                 |
|                    | AZ                    | US- 2003/0209893 A1                        | 11-2003                        | Breed et al.                                       |                                                                                 |
|                    | BA                    | US- 2007/0021915 A1                        | 01-2007                        | Breed et al.                                       |                                                                                 |
|                    | BB                    | US- 7,415,126 B2                           | 08-2008                        | Breed et al.                                       |                                                                                 |
|                    | BC                    | US- 2010/0063649 A1                        | 03-2010                        | Wu et al.                                          |                                                                                 |
|                    | BD                    | US- 7,904,053 B2                           | 03-2011                        | Krasner et al.                                     |                                                                                 |
|                    | BE                    | US- 8,082,014 B2                           | 12-2011                        | Causey et al.                                      |                                                                                 |
|                    | BF                    | US- 2012/0135764 A1                        | 05-2012                        | Ohashi, Kazunori                                   |                                                                                 |
|                    | BG                    | US- 2012/0158249 A1                        | 06-2012                        | Xu et al.                                          |                                                                                 |
|                    | BH                    | US- 2012/0282885 A1                        | 11-2012                        | Hamed et al.                                       |                                                                                 |
|                    | BI                    | US- 2013/0130639 A1                        | 05-2013                        | Oesterling et al.                                  |                                                                                 |
|                    | BJ                    | US- 2013/0253775 A1                        | 09-2013                        | Shimizu, Ryo                                       |                                                                                 |
|                    |                       | US-                                        |                                |                                                    |                                                                                 |
|                    |                       | US-                                        |                                |                                                    |                                                                                 |
|                    |                       | US-                                        |                                |                                                    |                                                                                 |
|                    |                       | US-                                        |                                |                                                    |                                                                                 |
|                    |                       | US-                                        |                                |                                                    |                                                                                 |
|                    |                       | US-                                        |                                |                                                    |                                                                                 |
|                    |                       | US-                                        |                                |                                                    |                                                                                 |

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|--------------------|-----------------------|---------------------------------------------------------------------------------|--------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------|----------------|
|                    |                       | Country Code <sup>5</sup> Number <sup>6</sup> Kind Code <sup>7</sup> (if known) |                                |                                                    |                                                                                 |                |
|                    |                       |                                                                                 |                                |                                                    |                                                                                 |                |
|                    |                       |                                                                                 |                                |                                                    |                                                                                 |                |
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|                    |                       |                                                                                 |                                |                                                    |                                                                                 |                |
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| Examiner Name          | Schechter, Andrew M |
| Attorney Docket Number | APIO-ID             |

Sheet 3 of 3

**NON PATENT LITERATURE DOCUMENTS**

| Examiner Initials* | Cite No. <sup>1</sup> | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>2</sup> |
|--------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|                    | BK                    | PCT/US2013/076432 International Search Report and Written Opinion, 04/09/2014, Ham, Joung Hyun.                                                                                                                                                                 |                |
|                    | BL                    | PCT/US2013/076410 International Search Report and Written Opinion, 04/07/2014, Song, Ho Keun.                                                                                                                                                                   |                |
|                    | BM                    | PCT/US2013/076426 International Search Report and Written Opinion, 04/09/2014, Ham, Joung Hyun.                                                                                                                                                                 |                |
|                    | BN                    | PCT/US2013/076440 International Search Report and Written Opinion, 04/09/2014, Sohn, Byoung Cheol.                                                                                                                                                              |                |
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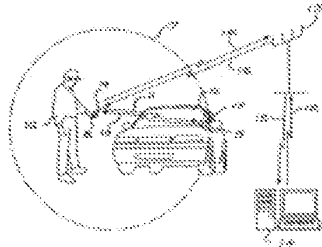
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 Title: (EN) VEHICLE IDENTIFICATION SYSTEM  
 (FR) SYSTEME D'IDENTIFICATION DE VEHICULES

**Abstract:**



(EN) The invention discloses a vehicle identification system including a first vehicle identification device (5) that is securable to a vehicle and comprising a first data repository for vehicle specific information, a first transmitter configured to transmit a first data output signal (10) upon reception of an activation signal, the first data output signal including vehicle specific information from the first data repository, and a first receiver configured to receive a data update signal to update the first data repository; a vehicle identification device reader (8) comprising a reader transmitter configured to transmit an activation signal, and a reader receiver configured to receive the first data output signal (10) from the first vehicle identification device (5); and a database (14) of vehicle specific information to which the reader (8) is connectable for comparison of the vehicle specific information with the first data output signal.

(FR) Cette invention se rapporte à un système d'identification de véhicules, qui comprend un premier dispositif d'identification de véhicules (5) pouvant être fixé à un véhicule, et comprenant un premier répertoire de données destiné à contenir les informations spécifiques du véhicule, un premier émetteur configuré pour transmettre un premier signal de sortie de données (10) à la réception d'un signal d'activation, ce premier signal de sortie de données contenant les informations spécifiques du véhicule provenant du premier répertoire de données, et un premier récepteur configuré pour recevoir un signal d'actualisation de données destiné à actualiser le premier répertoire de données; un lecteur de dispositif d'identification de véhicules (8) comprenant un émetteur de lecteur configuré pour transmettre un signal d'activation, et un récepteur de lecteur configuré pour recevoir le premier signal de sortie de données (10) en provenance du premier dispositif d'identification de véhicules (5); ainsi qu'une base de données (14) qui est destinée à contenir les informations spécifiques du véhicule et à laquelle le lecteur (8) peut être connecté pour permettre la comparaison des informations spécifiques du véhicule avec le premier signal de sortie de données.

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## VEHICLE IDENTIFICATION SYSTEM

### FIELD OF THE INVENTION

This invention relates to a vehicle identification system and apparatus for use with such system.

### BACKGROUND TO THE INVENTION

Vehicles are identified by various means including registration number plates, license tokens, manufacturer's engine number, chassis number and vehicle identification number (VIN), and so forth.

All of these rely on visual inspection of a number or code secured to a vehicle. Problems with this include that the numbers or codes may be obscured with mud and grime; they may have been physically damaged or removed; and the numbers or codes are, at least in some instances such as with vehicle registration number plates, easily alterable.

Electronic identification means are also available, which include a system that makes use of a transponder attached to a vehicle to identify the vehicle. With such a system the transponder is pre-programmed with a specified code that is used to identify the vehicle. The code is transmitted upon activation of the transponder and received by a dedicated receiver, which is programmed to interpret the code. This allows the receiver to display the information stored on the transponder. Such a system is used to establish the identity of a vehicle and allows the detection of stolen vehicles by comparison of the data received from the transponder on a vehicle to data stored on a computer database.

A problem with this type of system is that the status of the vehicle has to be determined by comparison of the vehicle particulars with the information in the database. This is in effect just an automated version of the traditional manner of status checking which involved dialling vehicle particulars to a dispatcher who would check the vehicle status on a computer linked to the database.

The existing systems also do not allow for information other than vehicle identification information to be stored on the transponder.

### OBJECT OF THE INVENTION

It is an object of this invention to provide a vehicle identification device to alleviate at least some of the abovementioned problems.

### SUMMARY OF THE INVENTION

In accordance with this invention there is provided a vehicle identification system including a first vehicle identification device being securable to a vehicle and comprising a first data repository for vehicle specific information, a first transmitter configured to transmit a first data output signal upon reception of an activation signal, the first data output signal including vehicle specific information from the first data repository, and a first receiver configured to receive a data update signal to update the first data repository; a vehicle identification device reader comprising a reader transmitter configured to transmit an activation signal, and a reader receiver configured to receive the first data output signal from the first vehicle identification device; and a database of vehicle specific information to which the reader is connectable for comparison of the vehicle specific information with the first data output signal.

There is further provided for the system to include a second vehicle identification device being securable to the vehicle and comprising a second data repository for vehicle specific information, and a second transmitter configured to transmit a second data output signal upon reception of the activation signal, the second data output signal including vehicle specific information from the second data repository; and for the reader to be configured to receive the second data output signal for comparison with the vehicle specific information in the database.

There is also provided for the first and second vehicle identification devices to include secure unique identification numbers, for the unique identification number of the first vehicle identification device to be included in the data repository of the second vehicle identification device, and for the unique identification number of the second vehicle identification device to be included in the data repository of the first vehicle identification device.

There is further provided for the reader to receive the data update signal including updated information from the database, and to transmit the data update signal to the first vehicle identification device.

There is also provided for the reader to be connectable to the database by wireless connection preferably a radio wave connection including GPRS and GSM connections.

There is also provided for the reader to include display means configured to display the information from the first and second data output signals in a predetermined format.

There is still further provided for the reader to be a handheld reader, alternatively for the reader to be incorporated into a roadside structure or in a road surface.

There is further provided for the vehicle specific information to include vehicle identification, vehicle license status, traffic fine information, vehicle roadworthy status, insurance status, and vehicle theft status.

There is still further provided for the first data repository to include also vehicle owner information, vehicle driver information, and commercial information.

There is also provided for the vehicle owner and vehicle driver information to include obligatory legal information including issued warrants of arrest information, vehicle owner and vehicle driver identification, drivers licence demerit point status, vehicle owner and vehicle driver medical information including blood type, allergies, and known special medical conditions, and emergency contact details including contact telephone numbers.

There is further provided for the commercial information to include security access information, commercial transactions, and club membership passes.

There is further provided for the vehicle owner information, vehicle driver information, and commercial information to be included in the first data output signal only upon reception of an authorization signal.

There is further provided for the information in the first data repository to be classified, for the information from each class to be transmitted only upon reception of the authorization signal, for the authorization signal to allow transmission of more than one class of information, and for the reader to transmit the authorization signal.

There is further provided for the reader to include input means for an access code, for the access code to be biometric data including fingerprints or retina scans, and for the access code to determine the authorization signal that the reader transmits.

There is further provided for the activation signal to comprise a magnetic field and for the vehicle identification devices to be powered by the magnetic field, alternatively for the devices to be connected to a power source, preferably integrated with the devices alternatively located remote from the device and connectable to the devices by means of a hard wire connection.

There is still further provided for the power source to include a solar energy converter configured to power the vehicle identification devices, alternatively configured to charge the power source.

There is also provided for the first and second vehicle identification devices to be transponders.

There is still further provided for the vehicle identification devices to be embeddable in a vehicle windscreen; alternatively to be integratable with a vehicle identification token, preferably a licence disc.

A further feature of the invention provides for the system to include a third vehicle identification device comprising a third data repository, and a third transmitter configured to transmit a third data output signal which includes vehicle specific information from the third data repository.

There is still further provided for the database to be connected to an audit database and to a vehicle registration database, for the vehicle specific information of the database to update the data on the vehicle registration database,

and for the audit database to be used to audit transactions between the database and the vehicle registration database.

There is further provided for a vehicle registration authority to operate the vehicle registration database and for an independent auditor to operate the audit database.

A still further feature of the invention provides for a method of operating a vehicle identification system including the steps of registering a vehicle in the database by a first authorised agent, issuing at least first and second vehicle identification devices, securing the first vehicle identification device to a first portion of the vehicle by the first agent, securing the second vehicle identification device to a second portion of the vehicle by the first agent, activating at least the first vehicle identification device to transmit a first data output signal, and receiving the first data output signal by a reader as defined above.

There is also provided for the method to include comparison of the vehicle specific information from the first data output signal with the vehicle specific information on the database, for changes to be transmitted to the reader, and for a data update signal to be transmitted from the reader to the first vehicle identification device.

There is further provided for the method to include the steps of displaying the information from the first data output signal on display means of the reader.

There is further provided for the step of registering the vehicle to include recording of the vehicle identification information and vehicle owner identification information by the first agent, and transmission of this identification information to the database for updating thereof.

There is further provided for the vehicle owner identification information to at least include a photograph of the driver, a driver's licence number and the identification number of the driver.

There is further provide for the agent to confirm the accuracy of vehicle identification information and the vehicle owner identification information by him by recording biometric signature of himself, specifically a fingerprint or a retina scan.

There is further provided for the method to include the step of issuing a second and third vehicle identification device to the vehicle owner by the first agent, securing the second vehicle identification device to the vehicle by the first agent, issuing the first vehicle identification device to the vehicle owner by a second authorised agent upon presentation of the third vehicle identification device, and securing the first vehicle identification device to the vehicle.

There is further provided for the first and second agents to operate from different locations, for the first agent to be an authorised retailer, and for the second agent to be a vehicle registration authority employee.

#### BRIEF DESCRIPTION OF THE DRAWINGS

An embodiment of the invention will be described below by way of example only and with reference to the accompanying drawings in which:

Figure 1 is a diagrammatic view of a first vehicle identification device according to the invention, secured to a licence disc holder;

Figure 2 is a schematic view of a vehicle identification system according to the invention.

#### DETAILED DESCRIPTION OF THE DRAWINGS

A first vehicle identification device is shown in Figure 1, and a vehicle identification system is shown in Figure 2.

The first vehicle identification device is first transponder (1) that includes a first data repository (2), receiver (3) and a first transmitter (4). The first data repository (2) includes vehicle specific information. The first transmitter (4) is



configured to transmit a first data output signal (10) that includes the vehicle specific information upon reception of an activation signal, and the receiver (3) is configured to receive a data update signal (11) to update the first data repository (2).

The first transponder (1) is secured to a licence disc holder (5), which is in turn secured to a vehicle windscreen (6). The system also includes a second vehicle identification device, which is a second transponder (17) secured to the rear window (not shown) of the vehicle. The second transponder (17) includes a second data repository (not shown) for vehicle specific information, and a second transmitter (not shown) configured to transmit a second data output signal including vehicle specific information from the second data repository upon reception of the activation signal.

The transponders (1, 17) are energized by an external magnetic field (7), which is generated by a magnetic field source, which in this embodiment is a vehicle identification device reader (8). The reader (8) includes a transmitter (not shown), and a receiver (9) that is configured to receive the first data output signal (10). In this embodiment the external magnetic field is also the activation signal. However, it is possible to transmit a specific activation signal to the transponders (1, 17), which will cause the transponders (1, 17) to transmit the data output signals.

The magnetic field (7) energizes the transponders (1, 17) to transmit the first data output signal (10) and second data output signal (not shown), which is received by the reader (8). The reader (8) transmits a data signal (12) via a radio wave network (13), which is typically a GSM or GPRS signal, to a computer database (14), which includes updated vehicle specific information. Upon reception of the data signal (12) from the reader (8) the database (14) transmits an updated data signal (15) that includes updated vehicle specific information, also via the radio wave network (13), to the reader (8). The data signal (15) is received by the receiver (9) and processed by the reader (8).

The updated vehicle specific information is then transmitted to the first transponder (1) only and the data in the first repository is updated. The data update signal (11) includes a secure authorization signal that allows the first repository (2) to be updated. Without this authorization signal the data in the first repository (2) cannot be altered.

When the reader receives the data output signal (10) from the transponder (1) it also displays the information in a predetermined format on a display (not shown) on the reader (8) for information of the authorized person (16) operating the reader (8). This person is typically a law enforcement officer at roadblock, but it could also be a law enforcement officer doing random checks on vehicles parked in a road, and so forth. Information fields that relate to the validity of an aspect of the vehicle, such as the roadworthiness of the vehicle which is valid for a fixed time period, do not have to be transmitted to the database for confirmation of the status. The specific field in the transponder will show when the last test was conducted and the reader's software will automatically calculate the date on which such test will expire.

To deter tampering with the first and second transponders (1, 17) also have unique identification numbers, which cannot be altered. Upon issuing the unique identification number of the first transponder is recorded in the second transponder and vice versa. This allows the transponders to verify each other upon activation. This information is also received by the reader (8) and confirmation of the verified transponders is displayed on the reader (8). If there is a problem with these numbers the reader (8) will alert the operator thereof by one or more of a flashing light, an audible alarm, or an special display on the display screen of the reader (8).

It is therefore possible to obtain secure vehicle specific information from the first and second transponders (1, 17) when the reader queries the transponders (1, 17).

Depending on the frequency of updating the information will also be very accurate. Information such as the vehicle registration number, VIN, engine number, chassis number and so on will not in the normal course of events change and will therefore always be up to date. Only when ownership of the vehicle changes may information such as the vehicle registration number change, but this will be updated in new set of transponders (1, 17) that will be issued to the new owner and will then remain valid until the vehicle ownership or vehicle details change.

Vehicle specific information that may change includes vehicle license status, vehicle roadworthy status, insurance status, traffic fine information and vehicle theft status. This information will obviously have to be updated as frequently as possible to keep the data in the transponder repository accurate.

The information in the first repository (2) also includes non-vehicle specific information, such as vehicle owner information, vehicle driver information, and commercial information.



The vehicle owner and vehicle driver information include issued warrants of arrest information; vehicle owner and vehicle driver identification; drivers licence demerit point status, vehicle owner and vehicle driver medical information including blood type, allergies, known special medical conditions, and emergency contact details including contact telephone numbers.

The commercial information includes security access information, commercial transactions, club membership passes, and so forth.

This allows non-law enforcement officers to also query the first transponder (1) for a response. The information in the first repository (2) is classified and depending on the authorization signal transmitted by the reader (8), certain classes of information will be transmitted by the first transponder (1).

For example, medical personnel at the scene of an accident may be allowed to access medical information of the vehicle owner or driver. This information will not be available to, for example, a security guard at a controlled access point. Only commercial information relevant to the controlled access of that area will be available to the guard.

The reader (8) includes a facility to enter an access code, which allows different classes of information to be transmitted to the reader. It is also possible to provide readers that will by default only allow specific classes of information to be read.

It is therefore possible for a law enforcement officer to query the vehicle at any time or location and obtain accurate information from the transponder about the vehicle identity, and also the status of for example traffic fines, warrants of arrest and so forth. The officer need not be in connection with the database, which is not always possible due to technical, financial, logistical, or geographical constraints.

The procedure to register a vehicle in the system includes the capturing of data from the vehicle owner by an authorised agent. The data includes the identity number and drivers licence number of the owner, as well as recording a digital picture of the owner.

The vehicle information is also recorded at this time, which includes the vehicle registration number, VIN, engine and chassis numbers. This is transmitted to the database (14) where it is compared with data on the network and if verified confirmation of this is transmitted to the agent. At this point the owner is also allowed to specify commercial and additional owner and driver information, which he may wish to register on the first transponder.

The computer system operated by the agent is now allowed to produce a second and third transponder, as described above. The second transponder, which only includes vehicle specific information, is secured to the rear window of the vehicle. The third transponder is used to identify the vehicle owner when he proceeds to a local authority licence office, where he has to obtain the first transponder.

The owner proceeds to the local authority licence office where he presents himself and the third transponder, which is read by a reader as described above. This identifies the owner to the licence office by displaying the picture of the owner, which was captured by the authorised agent, to the licence office employee. It also displays the drivers licence number. This is verified by comparison with the owner's driver's licence, which he has to produce at this time.

With the verified driver's licence and picture the computer system allows the first transponder, which is secured to a licence token in the form of disc and it is secured to the front windscreen of the vehicle.

Both the first and second transponders are now secured to the vehicle on different windscreens. The transponders are secured to the windows in a manner to prevent removal without destroying the transponders. This is done to prevent fraud.

If the owner wishes to update any information on the first transponder he has to visit an agent who will inspect the vehicle to confirm the identity thereof. As before the accuracy of the data is confirmed by the agent by recording his own biometric signature on the system. Once the information has been updated on the database the system produces new second and third transponders. The new second transponder is secured to the rear window and the old second transponder is removed. As before the owner takes the new third transponder to the local authority licence office for issuing of a new first transponder.

The information on the database (14) is updated to a vehicle registration database, such as the South African NATIS database. This allows for controlled flow of information between the databases. The system also includes a third audit database, which is controlled by an independent auditor, which in this embodiment is a reputable international auditing firm. The audit database checks all transactions between the database (14) and the vehicle registration database for anomalies and fraud. If any exceptions occur such a transaction may be traced completely and if there has been fraud the appropriate action may be taken. This will include updating the system to reflect the fraudulent status of the transponders issued to the specific vehicle owner.

When the specific vehicle next passes through a checkpoint or an updating point the first transponder will be updated with this information, which will allow the vehicle to be impounded and the owner apprehended.

It is envisaged that updating points will be located at convenient locations throughout an area such as a city, for example at busy intersections, tollgates, parking area entrances and the like. Such an updating point will have a reader which will read the transponders when the vehicle passes over it. When a vehicle, for example, waits for a traffic light to change the reader can activate the transponder and update the information on the transponder at that time. Such updating can occur a number of times daily when vehicles, especially in a city, spends time waiting at intersections.

It is also possible when a vehicle has for example been stolen to not only update the status of the vehicle to that of stolen on the transponder, but also to notify the law enforcement authorities of the location of that vehicle. With an adequate number of readers in an area it will be possible to track the location of the vehicle to enable recovery of the vehicle and apprehension of the thieves.

It will be understood that this is only one embodiment of the invention. It is possible to alter some aspects of the embodiment without departing from the scope of the invention.

It is for instance possible to provide a transponder with a dedicated power source such as an integral battery, or a hard wire connection to a power source in the vehicle. It is also possible to incorporate a solar energy converter in the licence disc, which may be used to power the transponder or charge a battery that powers the transponder.

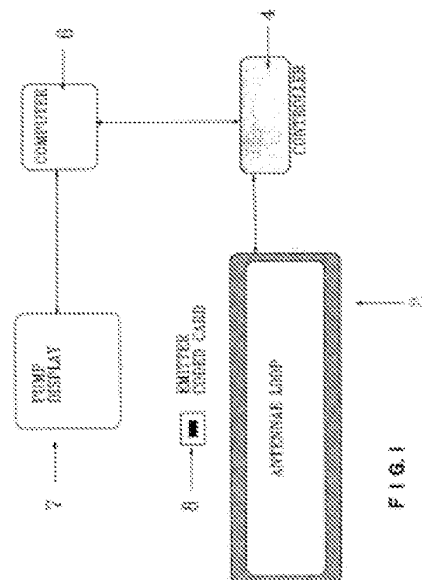
It is also possible for the reader to incorporate a barcode reader, which cooperates with a barcode traffic fine book. This will enable a traffic official to quickly capture details of a traffic offender by reading the first transponder, scan the barcode traffic fine book for the specific offence and to electronically capture the relevant details thereof. This will also enable traffic fines to be sent to drivers electronically, which reduces turnaround time on the recovery of fines.

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Inventors: RANDELMAN ROBERT ELLIS  
CHANCE RONALD RICHARD

(DE) Automatische Identifizierung und Serviceleistung an einem Fahrzeug und Rechnungsstellung der Serviceleistung für den Fahrzeugeigner.

**Abstract:**



**[EN]** The present invention is a system and method for identifying a vehicle in a prescribed area and associating services with the vehicle. For automatically identifying and providing service to a vehicle and for billing the vehicle owner for the service provided, the vehicle's arrival in the service area is detected by an antenna (2) activating an emitter (8) on the vehicle, which emitter transmits a coded signal of the vehicle identity to controller (4), which converts the received signal into a data bit stream received in a computer (6). The computer calculates and stores costs

for services provided to each vehicle owner.

[0001] The invention relates to a system and method for automatically identifying and providing service to a vehicle moving in a prescribed area. An automatic vehicle recognition and service data transmission system is already known from citation GB-A-2 224 418. This known system comprises a transmitter attached to the vehicle and a receiver at a vehicle station for receiving information transmitted by the transmitter about fuel consumption, mileage, vehicle information and other relevant data. The transmitter is triggered when the vehicle reaches the station. In particular, the present invention is a system to automatically identify vehicles and correlate purchased products and services with vehicle-owner customers of service stations, convenience stores or other similar establishments, for billing vehicle owners for services provided. In addition, other vehicle or customer information can be transferred to inform, track or notify both customers and providers.

[0002] There are many instances when vehicle information is required rather than operator information. These may include situations such as: notifying individuals of vehicle maintenance; providing the customer with vehicle information or promotions during fuel filling; build upon customer or vehicle recognition, tracking or notification; provide alternatives for credit/debit card billing, especially for fleet billing; and provide records of service or maintenance for a specific car.

[0003] According to the invention from one aspect, there is provided a system for automatically identifying and providing service to a vehicle and billing the vehicle owner for the service provided, comprising:

- a) means for determining electronically whether an approaching vehicle is stopping for service,
- b) a file, database or other computer storage device, containing vehicle, and service cost or service type, records,
- c) means for identifying said vehicle electronically as it enters a service area in order to associate it with records in said computer storage device,
- d) means for preventing any other electronic identification by any other nearby service areas, when the vehicle has stopped in said service area and has been electronically identified,
- e) means for providing service to said stationary identified vehicle,
- f) means for transferring data representing the cost or type of said service provided, to said records in said computer storage device, and
- g) means for calculating and storing all costs for service, or type of service information in said records for a given billing period, and for invoicing said cost to said vehicle owner.

[0004] According to the invention from another aspect there is provided a method for automatically identifying and providing service to a vehicle and billing the vehicle owner for the service provided, comprising:

- a) determining electronically whether an approaching vehicle is stopping for service,
- b) identifying said vehicle electronically as it enters a service area in order to associate it with records in a file, database, or other computer storage devices,
- c) preventing any other electronic identification from other nearby service areas, when the vehicle has stopped in said service area and has been electronically identified,
- d) providing service to said stationary identified vehicle,
- e) transferring data representing the cost or type of said service provided, to said records in said computer storage device, and
- f) calculation and storing all costs for service, or type of service information in said records for a given billing period, and for invoicing said cost to said vehicle owner.

[0005] In a preferred embodiment, the system includes an antennae which emits an electromagnetic field at a predetermined frequency. This field causes an emitter (card) affixed to the vehicle to be energized when the vehicle approaches the vicinity of the antennae. The emitter responds by sending out an encoded electromagnetic signal. The system includes a controller which performs two functions. These functions may be performed by separate units or combined into one electronic unit. One function is to detect the signal by the emitter and convert it into a data stream in the computer. Electronic equipment that identifies vehicles is well known in the art, see e.g. U.S. 4,782,342 and U.S. 4,888,474. In addition, the controller may relay the information back to the card where it may be stored for later transmission, and, for this purpose, the controller has the second function of regulating the power and frequency of the antennae. In this capacity, the card serves as a transponder. A computer then utilizes the data stream along with accounting or billing information and stores the data for later use.

[0006] The present method and system allows for automatically recognizing, identifying and servicing a vehicle and invoicing the vehicle owner which may be an organization such as a company or government entity, e.g., school district (hereinafter referred to as a vehicle owner).

[0007] The invention will be better understood by referring, by way of example, to the accompanying drawings, wherein:-

[0008] Figure 1 shows a schematic diagram representing a first embodiment of the invention.

[0009] Figure 2 shows more details of a preferred way of putting the system of Figure 1 into effect.

[0010] Figure 3 is a flow diagram representing one way of detecting vehicles and automatically capturing and utilizing billing information.

[0011] Figure 4 is a flow diagram representing updating customer records, and generating reports and summaries.

[0012] Figure 1 shows the components of one embodiment of the system. The system includes a number of components: an antennae (2) which outputs a predetermined radio frequency; an electronic device on a customer-vehicle, consisting of an inductor loop and integrated circuit package, termed a "card" (8), which stores information and transmits said information on another predetermined frequency when activated by the radio frequency of the antennae, an electronic box, termed "controller" (4), which translates the received signal from the card (8) into a data bit stream; a computer (6) which receives the data bit stream from the controller and in turn utilizes the received data; and a display (7) (eg. a pump display where the system is utilized in a gasoline service station). In addition computer (6) may relay a data stream back to controller (4), which then broadcasts this data to the card (8) through antenna (2), the broadcast data received by card (8) being stored for later usage.

[0013] Figure 2 shows one configuration of the system in which an antennae (2), being a loop, rod or other radio frequency emitting/receiving device, is embedded in the proximity of the gasoline dispensing pump or area (3). The service pump area is used for illustration only and any service area may be used in the present invention. Other areas considered to be service areas include a pump area, may service area, vending or convenience store area, or any other area within the confines of the station property. This antennae (2) is connected to an electronics box, termed a controller (4), that controls the radio frequency (RF) output signal and detects an RF input signal from card (8). The controller then translates the RF input signal into a computer data stream format. The controller may be located in a housing (5) near the antennae. For example, the housing (5) may be fixed to a support or an overhead canopy. The system may also include a display screen (7) atop or in the vicinity of the pump (9).

[0014] The antennae is always energized and therefore produces an electromagnetic (EM) field in the fueling area. In addition, there is a means of detecting the direction of a vehicle as it approaches the fueling area by using a secondary antennae, computer software and/or hardware. The EM field is in the radio frequency band and is chosen so as to minimize interference from other electronic or RF sources, such as vehicle ignition systems, lighting, or other RF generating sources. In addition, the broadcast band must conform to all applicable legal specifications such as

frequency, power, licensing and bandwidth.

**[0015]** Placed on a vehicle is a device including an integrated circuit component and a RF coil. This device, termed a "card" (8), is activated when it crosses the EM field provided by the antennae. Circuitry on the card prevents energizing in the presence of a "false" or stray field. Upon activation, the card emits an EM radio frequency pulse or "broadcast" which is then received and decoded by the controller into a data bit stream. Some method of discriminating interfering pulses from those emitted from the card is provided.

**[0016]** The data bit stream decoded from the radio frequency pulse is then transferred either electronically or optically to a computer, which may be included in the same housing (5) with the controller, where the data is stored and utilized. In addition, the computer may relay back a data stream to the controller, which in turn broadcasts this information back to the card through the antennae system. The card receives the broadcast and likewise stores the information internally for later usage.

**[0017]** The data bit stream recovered from the card can be utilized in a number of ways, which include, for example, customer accounting, billing, recognition, tracking or promotion. Subsequently vehicle identity, tracking, security, service or maintenance logging and notification may also be accomplished. Vehicle identification is a major difference between the described system and the current use of a credit or debit card. Whereas a credit or debit card identifies a particular individual customer, the present system identifies a particular vehicle irrespective of the vehicle operator. In addition, the information from the data bit stream may be used along with information stored in the computer as a basis for other sensor technologies where vehicle or customer information is required, such as vehicle maintenance alerts, recalls, and specification attainment.

**[0018]** Figure 3 depicts a flowchart of steps used to perform the previously mentioned embodiment in which a car is identified, the customer is informed, and information is relayed back to the card on the vehicle.

**[0019]** The method starts with a reset operation (10) in which the loop and controller are cleared of any fault condition and readied for activation. This reset operation may include loading computer files, updating said files or records within those files, setting electronic or other indicating devices to zero or a previously determined initial state. Any communication links between the various elements of the system are reset and, if needed, initialized. This reset operation can be thought of as setting all elements of the system to their nominal operating state. After the completion of the reset operation the system is considered to be ready for operation. A query (12) determines whether or not the device is armed, the term "armed" being defined as the state in which the device and all associated supporting computer devices are ready to receive, transmit, store and/or analyze data; and are controlling the antennae system properly. If this state is logically "False" or for simplicity "NO", then the system is reset (10); if this is state is logically "True" or for simplicity "YES", then display a sign on message (14) and wait for approaching vehicle. At this point the system is armed and considered in a "READY" state. The next operation is to query if a vehicle approaches (16). If NO then reset the system (10); if YES, then energize and receive information from card on the vehicle (18). This step entails waiting for the vehicle card to energize and transmit the previously stored information contained on said card. The next step (20) is to query and determine if indeed the vehicle has stopped moving. This could be done in a variety of ways, however one way would be to continuously receive the same broadcast for the vehicle tag a set number of times, say five. Another way would be to measure the signal strength of the broadcast until it has reached an equilibrium value for a set period of time. This query would account for those customers who are merely driving through the service or fueling area and do not intend to receive fuel products or service. If vehicle is not stopped, i.e., "NO" then reset the system (10); if "YES", then re-receive a broadcast from the vehicle (22). This operation receives the card information and stores said information. The next operation (24) is to query whether or not the broadcast is translated properly into a data bit stream. If "NO", then the broadcast is re-received (22); if "YES", then the data bit stream is stored for later use as a validation point and the capture of the identity or other recognition information is prevented by the other controllers or computers in the area. This operation is termed "Vehicle Lock Out" (26). In a sense, this alerts the other controllers and computers in this, and other adjacent service areas, that an operation is pending on a vehicle and they are not to recognize it.

**[0020]** At this point a vehicle has been recognized and would now be ready to obtain services. The next operation would be to dispense or administer products and or services and record that information (28). While services are

being administered, information may be sent to a customer display (30). It should be noted that this operation (30) may take place during or after any proceeding or succeeding steps. This step is described here as only an illustration. Next the card is interrogated and a broadcast is re-received (32). The broadcast may be received continuously from step (22) through (32) until services are ceased, for simplicity (32) is termed "a second time." It is assumed that this broadcast is received successfully and understood that if this is not the case, then the card will be interrogated until such a time that a suitable broadcast is received that can be translated into a data bit stream. This data bit stream is then stored as the second validation point. The next operation (38) queries if the first validation point obtained at (22) is identical to the second validation point obtained at (32). In addition, cross checking or otherwise validating credit or other billing information may be performed. This may include verifying authorized operators. If "NO", the validation points do not match and this transaction is considered invalid (34). An alert (36), such as an alarm, is sounded so that an attendant or other employee or supervisor may be notified. In this case of an invalid transaction, manual recording or intervention may be required. After this alarm or alert, which may have to be cleared or otherwise acknowledged by an attendant or employee, the system is then reset (10). If the query (38) is "YES" then the vehicle is considered authorized, the transaction valid and accounting or other business or statistical data, which may include customer preferences and/or services rendered, are logged (40). This logging operation may entail updating customer records, writing appropriate receipts, updating database files and/or transmitting information to other computers. Details of this operation are provided in Figure 4.

[0021] The next operation (42) queries if information would like to be relayed back to the card. This information may be service records or history, accounting, customer preference, or other information which one would want to be associated with a vehicle rather than to an individual.

[0022] If this query is "NO", that is that no relay information is to be sent, then the next operation would be unlocking the controllers (48) described below.

[0023] If this query is "YES" then the information is formulated in a computer, translated into an appropriate data bit stream code, which may be encoded in any fashion, and then broadcasted to the card. The card receives the broadcast, likewise translates said broadcast into a data bit stream and stores said data bit stream electronically within the card's electronic package. This operation is termed "relaying" and is depicted as operation (44) on Figure 3. The next operation (46) queries if this relayed information is received properly. This operation entails having the card to broadcast the stored information and the data bit stream resulting from this broadcast is compared to the data bit stream formulated in operation (44). If query (46) is "NO" then the data bit stream is rebroadcasted to the card (44). If this query is "YES" then this information has been stored onto the card correctly and the next operation may proceed.

[0024] The next operation (48) is to unlock the controllers and in so doing alert the other computers that a transaction is completed with this identified vehicle. Information about the transaction may be transferred to the other controllers, computers or other devices that may analyze, store, or otherwise use the transaction information. These computers are not limited to those associated with a particular service facility, but may in fact be a computer network or supervisory computer located at another location. This procedure (48) so described is the enabling analog of the disabling operation of "lock-out" described as (26).

[0025] The transaction/information gathering cycle is now considered complete and as a final operation (50) the system is driven into a reset condition (10).

[0026] Figure 4 depicts the flowchart of the method used to initialize and log customer records. For the initialization operation, which may include re-initialization of an existing customer, the required data files are set up as described from (52) through (69). The return step (100) would then be a system reset (10).

[0027] In the normal operating mode in which customer files already exist, the method in Figure 4 normally operates after (40). At the START (52) various data are passed from the main. This information is the emitter code information, customer log information, change flag value (CFLG), and transaction information. The method begins with a query (54) if this is a new customer. A new customer or an established customer who requests changes in the components of the various files are signified by a CFLG > 0. If "YES" then assign a vehicle code number (VCN) in operation (56). The VCN may be the manufacturer's vehicle identification number (VIN) or another number that uniquely describes a



particular vehicle. If CLFG > 0 and a VCN is passed, then this signifies an existing customer who wishes their records or files, as described below, changed or updated. The term "updating" here refers to altering, creating or appending records or files that are associated with a particular vehicle or customer. Next the customer log file (CLF) is updated (58). The CLF stores the various activities such as purchasing fuel or services and the station, date and time. Next the customer accounting file (CAF) is updated with the new customer record (60). The accounting record contains all data needed for accounting purposes such as billing address, discounts, and authorized purchases or products. The next operation is updating the customer service file (CSF) in operation (62). The CSF contains the service records of work done on an identified vehicle such as last service dates, service records, service items, or maintenance schedules. The next file (64) that is updated for the new customer is the customer preference file (CPF). The CPF stores the customer desired information. This may include various customer preferred product choices, service appointment times, accounting or method of payment choices. The last file updated for a new customer in operation (66) is the customer cross reference file (CXF). The CXF provides a "lookup table" between the VCN, CLF, CAF, CSF, and CPF to simplify sorting, record addition or deletion, and report generation. At the conclusion of operation (66) a customer is fully integrated into the system and the process then continues.

**[0028]** If the query (54) of a new customer is "NO" then the next operation is to obtain the VCN from the emitter information (69). Note that this operation is also the entry point to update the files to record a transaction. A query (70) tests if the CXF matches the checksums for the VCN, CLF, CAF, CSF, and CPF. The checksums test identifies if the file structure system is still intact and has not been corrupted or altered in any way. If "NO", that is the files are corrupted, then the method proceeds to operation (72) in which the files are rebuilt from a backup set on other means for correcting the corruption. If the query (70) is "YES" then the method proceeds through a sequence of operations that record the components of a transaction. While one order of recording is described here, there are other methodologies and this described method is for illustration only. The overall aspect of the next sequence from (74-100) is that all transactions and operations are recorded in these sequences. Query (73) tests if this is a customer record information change only. If "YES" then continue to (96) which will yield a return (100), if "NO" then continue.

**[0029]** Operation (74) queries if the Master VCN has been passed at (52). The Master VCN can be thought of as a "security code" that would enable authorized personnel to obtain summary, report, or other compiled or individual transaction activity reports. The Master VCN is not necessarily derived from a physical emitter or card, though it could be, but may be a code that is manually introduced. If Query (74) is "NO" then it is assumed that this transaction is a customer transaction. The next operation (76) is to update the CLF with the appropriate information. Next, the product purchase information is stored on a temporary file called the Temporary Transaction Record (TTR) (78). This operation is also done at Figure 3, operation (28). Next a query (80) determines if service was performed on the vehicle. If "YES", then the CSF is updated (82) and the service accounting information is added to the TTR (83). If "NO" then the method proceeds to (84) where the TTR is written on the CAF to update that file for the completed transaction. The next operation (86) is to update the CXF of the changes made.

**[0030]** If the query in (74) is "YES", that is that the master VCN has been passed, then a second security code is requested (88). The next operation (89) queries if the second security code is validated. If "NO" then the operation proceeds to (100) to return. If "YES" then a query (90) determines if a report is to be generated. If "YES" then that report is generated (91). This report is a general summary of all transactions. If "NO" then the operation proceeds to another query (92) whether a summary report is requested. If "YES" then a summary report is generated (93). This report is similar to a general report, though it covers specified customers, times or other qualifying conditions. If "NO" then the next operation is to query if an accounting summary is to be generated (94). If "YES" then an accounting report is generated (95). This accounting report might be a billing report, accounting summary report, or other such report for accounting or billing purposes. If "NO" then the next operation is (96).

**[0031]** Operation (96) follows operations (95), (94), (89), (86), or (73) and is described as the "Close-Out". Operation (96) updates the various checksum or file corruption detection methods. The next operation queries if a backup of the files should be made (98). Backups may be made after any specified time period, generally daily or weekly. The decision for the result of this query may be made manually or automatically. If query (98) is "YES" then operation (99) performs this data backup and may transmit information to the controller computers [(4) in Figure 1.]. The final operation of the sequence is (100), RETURNS, which returns operation back to the main operational sequence, (40) of Figure 3.



[0032] The present system may include a number of features. For example, one embodiment may include a display screen (7) as described in operation (30) of Figure 3. The screen may be part of the dispensing pump (9) (see Figure 2) or enclosed in a separate housing nearby or on the pump (9). When the card information is received, the computer would transmit information to the display for notifying the vehicle operator. This information may be promotional in nature or describe information relating to that particular vehicle, customer records or accounts.

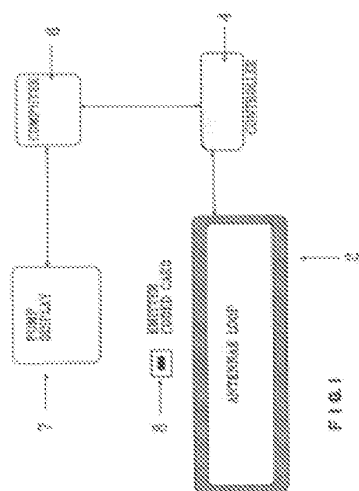
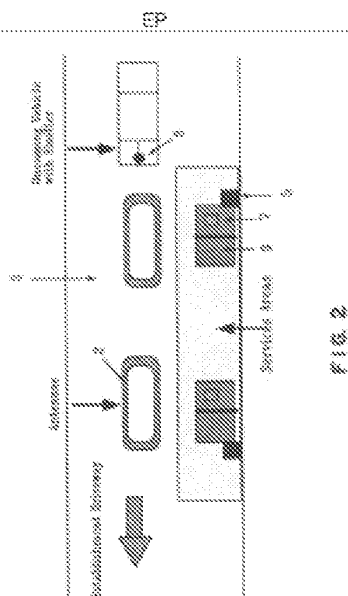
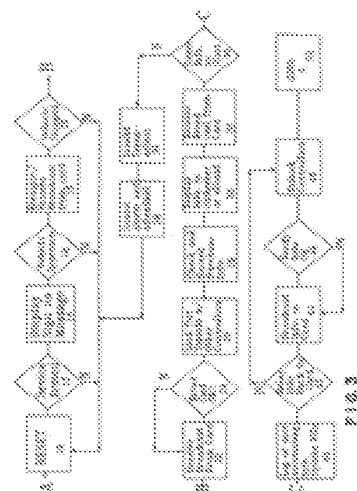
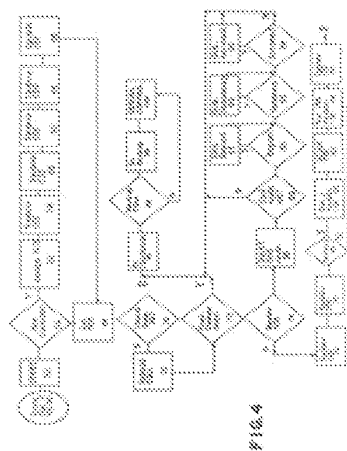
[0033] In the preferred embodiment, the data stream is used for automated customer billing, such as fleet billing, local customer accounting or as a replacement or auxiliary to charge or debit cards. Here, fuel or service purchases would be recorded by communicating to the computer a log with the customer vehicle identity. In this way a record of vehicle fuel, product, or services could be stored for later billing or accounting use. Therefore, the purchases are associated with a vehicle rather than an individual vehicle operator. This is very important where purchases are to be billed against a fleet or group of vehicles rather than those persons who utilize the vehicles.

[0034] In a development, vehicle information is provided to other sensors or devices within the service or fueling area. These devices may require information such as customer preferences, vehicle manufacturing specification data or servicing information to perform other services to the vehicle or provide the vehicle operator with vehicle specific information.



2. (EP0461888) Automatically identifying and providing service to a vehicle and billing the vehicle owner for the service provided.

| National Biblio. Data | Description | Claims | Drawings | Documents |
|-----------------------|-------------|--------|----------|-----------|
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**MENU****SEARCH****INDEX****DETAIL****JAPANESE**

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## PATENT ABSTRACTS OF JAPAN

(11)Publication number : **2009-177758**(43)Date of publication of application : **06.08.2009**

(51)Int.Cl. **H04M 1/00 (2006.01)**  
**H04M 1/11 (2006.01)**

(21)Application number : **2008-040662** (71)Applicant : **TAKASHIMA  
TAKASHI**

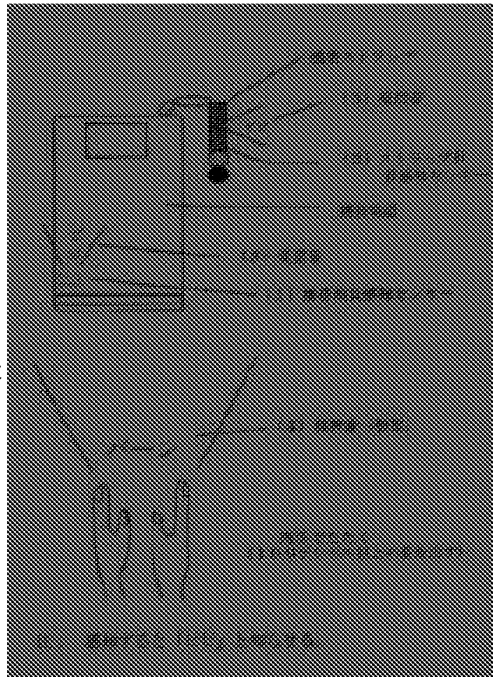
(22)Date of filing : **24.01.2008** (72)Inventor : **TAKASHIMA  
TAKASHI**

### (54) MOBILE PHONE DETECTOR WITH SOUND-SENSING FUNCTION

#### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a mobile phone detector instantly reporting the location of a mobile phone by using a sound sensor.

**SOLUTION:** A sound-sensitive sensor is mounted on a mobile phone body or a mobile phone strap, and the sound-sensitive sensor is set to sense an external sound at a level above 100 dB. When the sensor senses a sound at a level around not smaller than 100 dB, this mobile phone detector makes a sound for reporting the location of the mobile phone to a person having lost the mobile phone.





**MENU****SEARCH****INDEX****DETAIL****JAPANESE**

Please click here for details of Stored Data Information of [DETAIL].

## PATENT ABSTRACTS OF JAPAN

(11)Publication number : **2007-183865**(43)Date of publication of application : **19.07.2007**

|             |             |              |                  |
|-------------|-------------|--------------|------------------|
| (51)Int.Cl. | <b>G08B</b> | <b>25/08</b> | <b>(2006.01)</b> |
|             | <b>B60R</b> | <b>21/01</b> | <b>(2006.01)</b> |
|             | <b>B60R</b> | <b>21/00</b> | <b>(2006.01)</b> |
|             | <b>G08G</b> | <b>1/09</b>  | <b>(2006.01)</b> |
|             | <b>G08G</b> | <b>1/13</b>  | <b>(2006.01)</b> |
|             | <b>B60R</b> | <b>21/16</b> | <b>(2006.01)</b> |

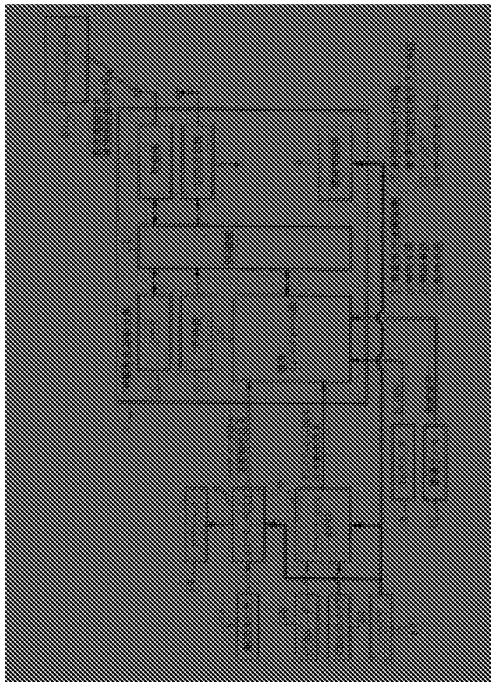
(21)Application number : **2006-002408** (71)Applicant : **DENSO CORP**(22)Date of filing : **10.01.2006** (72)Inventor : **SAKAI HIROSHI**

### (54) ON-VEHICLE EMERGENCY NOTIFICATION DEVICE

#### (57)Abstract:

**PROBLEM TO BE SOLVED:** To perform an emergency notification operation appropriately without being made disadvantageous in cost and meager in practicality.

**SOLUTION:** When a pre-crash signal is input from a pre-crash ECU 10, this on-vehicle emergency notification device 1 transmits an emergency notification signal to a service center 21 even when any air-back signal is not input from an air-back ECU 9. When there is possibility that a vehicle may collide in a status that a power from the battery 17 is normally supplied as an operating power, the emergency notification signal can be transmitted to the service center 21, and the emergency notification operation can be properly executed. In this case, it is not necessary to load any auxiliary battery assuming that power supply from the battery 17 is interrupted. Thus, the on-vehicle emergency notification device is not made disadvantageous in cost and meager in practicality.





**MENU****SEARCH****INDEX****DETAIL****JAPANESE**

Please click here for details of Stored Data Information of [DETAIL].

## PATENT ABSTRACTS OF JAPAN

(11)Publication number : **10-260241**(43)Date of publication of application : **29.09.1998**

(51)Int.Cl. **G01S 5/02**  
**G01C 21/00**  
**G01S 5/14**  
**G08G 1/0969**  
**H04Q 7/34**

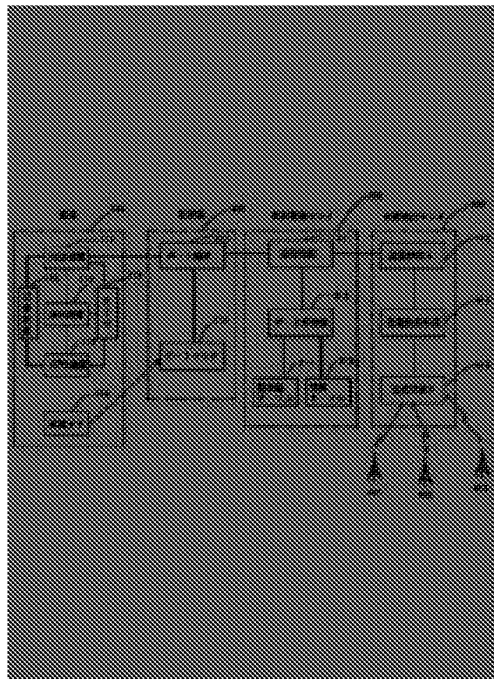
(21)Application number : **09-064961** (71)Applicant : **HONDA MOTOR CO LTD**  
 (22)Date of filing : **18.03.1997** (72)Inventor : **MAKINO HIROAKI**

### (54) SYSTEM AND METHOD FOR DETECTING POSITION OF VEHICLE

#### (57)Abstract:

**PROBLEM TO BE SOLVED:** To specify a floor where a vehicle is present at a parking lot having a plurality of floors and correctly detect a position, by receiving information of electric field intensities from at least three or more PHS(personal handy phone system) base stations and analyzing the information.

**SOLUTION:** When a vehicle 100 passes a parking lot gate, a vehicle tag 114 is read. A port terminal 211 transfers a bar code information of the vehicle 100 to a vehicle management center 300. The vehicle management center 300 selects three PHS base stations near the parking lot which receive an ID information emitted from a PHS device 111. A transmitting







## PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

|                                                                                    |                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| To:<br>JOHN WHELAN<br><br>2345 HALLOWING POINT RD PRINCE FREDERICK MD<br>20678 USA | <h1 style="margin: 0;">PCT</h1> <p style="margin: 0;"><b>NOTIFICATION OF TRANSMITTAL OF<br/>THE INTERNATIONAL SEARCH REPORT AND<br/>THE WRITTEN OPINION OF THE INTERNATIONAL<br/>SEARCHING AUTHORITY, OR THE DECLARATION</b></p> <p style="margin: 0;">(PCT Rule 44.1)</p> |
| Applicant's or agent's file reference<br>30302                                     | Date of mailing<br>(day/month/year) 07 April 2014 (07.04.2014)                                                                                                                                                                                                             |
| International application No.<br><b>PCT/US2013/076410</b>                          | International filing date<br>(day/month/year) 19 December 2013 (19.12.2013)                                                                                                                                                                                                |
| Applicant<br><b>SIMON, SASCHA</b>                                                  |                                                                                                                                                                                                                                                                            |

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.
- Filing of amendments and statement under Article 19:**  
 The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):  
**When?** The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.  
**Where?** Directly to the International Bureau of WIPO, 34 chemin des Colombettes  
 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 92 70  
**For more detailed instructions, see PCT Applicant's Guide, International Phase, paragraphs 9.004 - 9.011.**
2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.
3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 46.2, the applicant is notified that:  
☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.  
☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.
4. **Reminders**  
 The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.  
 Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90bis.1 and 90bis.3).  
 Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.  
 In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.  
 For details about the applicable time limits, Office by Office, see [www.wipo.int/pct/en/texts/time\\_limits.html](http://www.wipo.int/pct/en/texts/time_limits.html) and the PCT Applicant's Guide, National Chapters.

|                                                                                                                                                                                                                                          |                                                                    |
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| Name and mailing address of the ISA/KR<br>International Application Division<br>Korean Intellectual Property Office<br>189 Cheongso-ro, Seo-gu, Daejeon Metropolitan City, 302-701,<br>Republic of Korea<br>Facsimile No. 82-42-472-7140 | Authorized officer<br>COMMISSIONER<br>Telephone No. 82-42-481-5875 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|

Form PCT/ISA/220 (July 2010)

\* Attention

Copies of the documents cited in the international search report can be searched in the following Korean Intellectual Property Office English website for six months(expire date : **2014.10.08** ) from the date of mailing of the international search report.

<http://www.kipo.go.kr/en/> => PCT Services => PCT Services

ID : PCT international application number

PW : **P6L2H2VV**

Inquiries related to PCT International Search Report or Written Opinion prepared by KIPO as an International Searching Authority can be answered not only by KIPO but also through IPKC (Intellectual Property Korea Center), located in Vienna, VA, which functions as a PCT Help Desk for PCT applicants.

Homepage: <http://www.ipkcenter.com>

Email: [ipkc@ipkcenter.com](mailto:ipkc@ipkcenter.com)

Notes to Form PCT/ISA/220 (July 2010)

## PATENT COOPERATION TREATY

PCT/US2013/076410

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

|                                                           |                                                                                             |                                                                                     |
|-----------------------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Applicant's or agent's file reference<br>30302            | <b>FOR FURTHER ACTION</b> see Form PCT/ISA/220 as well as, where applicable, item 5 below.  |                                                                                     |
| International application No.<br><b>PCT/US2013/076410</b> | International filing date ( <i>day/month/year</i> )<br><b>19 December 2013 (19.12.2013)</b> | (Earliest) Priority Date ( <i>day/month/year</i> )<br>21 December 2012 (21.12.2012) |
| Applicant<br><b>SIMON, SASCHA</b>                         |                                                                                             |                                                                                     |

This International search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

☒ the international application in the language in which it was filed

☐ a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box No. II)

3. ☐ **Unity of invention is lacking** (See Box No. III)

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 4

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract

Form PCT/ISA/210 (first sheet) (July 2009)

## INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/US2013/076410**

| <b>A. CLASSIFICATION OF SUBJECT MATTER</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                       |                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| B60W 50/08(2006.01)i, B60R 25/00(2006.01)i, B60R 16/02(2006.01)i                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                       |                                                                                         |
| According to International Patent Classification (IPC) or to both national classification and IPC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                       |                                                                                         |
| <b>B. FIELDS SEARCHED</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                       |                                                                                         |
| Minimum documentation searched (classification system followed by classification symbols)<br>B60W 50/08; G06K 7/00; F42C 15/00; G06F 17/00; B60R 25/00; G01S 5/02; G01C 21/00; G07C 5/08; B60R 16/02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                       |                                                                                         |
| Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched<br>Korean utility models and applications for utility models<br>Japanese utility models and applications for utility models                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                       |                                                                                         |
| Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)<br>eKOMPASS(KIPO internal) & Keywords: vehicle, identification, electric, magnetic, field, compare, and mobile                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                       |                                                                                         |
| <b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                       |                                                                                         |
| Category*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Citation of document, with indication, where appropriate, of the relevant passages                                                    | Relevant to claim No.                                                                   |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | US 7136828 B1 (ALLEN et al.) 14 November 2006<br>See column 4, lines 40-67, column 9, line 31 ~ column 10, line 8; and figures 1A, 2. | 1-42                                                                                    |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | WO 03-005275 A1 (COTTY, DAMYEN EDWARD ALBERT) 20 November 2003<br>See page 7, line 9 ~ page 8, line 31; and figures 1, 2.             | 1-42                                                                                    |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | JP 10-260241 A (HONDA MOTOR CO., LTD.) 20 September 1998<br>See paragraphs [0027]-[0030]; and figures 2, 3.                           | 1-42                                                                                    |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | US 2008-0026345 A1 (THERMAN et al.) 10 February 2008<br>See paragraphs [0012], [0053]; and figure 1.                                  | 1-42                                                                                    |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | EP 0461838 A2 (EXXON RESEARCH AND ENGINEERING COMPANY) 10 December 1991<br>See column 3, lines 16-47; and figure 1.                   | 1-42                                                                                    |
| <input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                       |                                                                                         |
| <p>* Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"I" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&amp;" document member of the same patent family</p> |                                                                                                                                       |                                                                                         |
| Date of the actual completion of the international search<br>02 April 2014 (02.04.2014)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                       | Date of mailing of the international search report<br><b>07 April 2014 (07.04.2014)</b> |
| Name and mailing address of the ISA/KR<br>International Application Division<br>Korean Intellectual Property Office<br>199 Chungjeon-ro, Seongju, Daegu Metropolitan City, 392-701,<br>Republic of Korea<br>Facsimile No. +82-42-472-7140                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                       | Authorized officer<br>SONG, Ho Keun<br>Telephone No. +82-42-481-5586                    |

Form PCT/ISA/210 (second sheet) (July 2009)

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.  
**PCT/US2013/076410**

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
|-------------------------------------------|---------------------|----------------------------|---------------------|
| US 7136828 B1                             | 14/11/2006          | US 2005-0046504 A1         | 03/03/2005          |
|                                           |                     | US 2005-0134481 A1         | 23/06/2005          |
|                                           |                     | US 2008-0143555 A1         | 19/06/2008          |
|                                           |                     | US 2009-0174575 A1         | 09/07/2009          |
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|                                           |                     | US 7015827 B2              | 21/03/2006          |
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|                                           |                     | US 7324015 B1              | 29/01/2008          |
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|                                           |                     | US 8543285 B2              | 24/09/2013          |
| WO 03-095276 A1                           | 20/11/2003          | AE 2003-230075 A1          | 11/11/2003          |
| JP 10-260241 A                            | 29/09/1998          | JP 3235050 B2              | 04/12/2001          |
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|                                           |                     | WO 03-003925 A2            | 09/01/2003          |
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| EP 0461888 A2                             | 18/12/1991          | AT 118302 T                | 15/03/1995          |
|                                           |                     | DE 69107095 D1             | 06/01/1995          |
|                                           |                     | DE 69107095 T2             | 29/06/1995          |
|                                           |                     | EP 0461888 A3              | 26/02/1992          |
|                                           |                     | EP 0461888 B1              | 01/03/1995          |
|                                           |                     | FI 912810 A0               | 11/06/1991          |
|                                           |                     | FI 912810 D0               | 11/06/1991          |
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|                                           |                     | IE 911976 A1               | 18/12/1991          |
|                                           |                     | JP 04-233067 A             | 21/08/1992          |
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|                                           |                     | PT 97329 A                 | 31/08/1993          |
|                                           |                     | US 5072580 A               | 10/12/1991          |

Form PCT/ISA/210 (patent family annex) (July 2009)

## PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:  
JOHN WHELAN  
  
2315 HALLOWING POINT RD PRINCE FREDERICK MD  
20678 USA

PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

|                                                                                                                                                              |                                                                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Date of mailing<br>(day/month/year) 07 April 2014 (07.04.2014)                                                                                               |                                                                                    |
| Applicant's or agent's file reference<br>30302                                                                                                               | FOR FURTHER ACTION<br>See paragraph 2 below                                        |
| International application No.<br><b>PCT/US2013/076410</b>                                                                                                    | International filing date (day/month/year)<br><b>19 December 2013 (19.12.2013)</b> |
| Priority date(day/month/year)<br>21 December 2012 (21.12.2012)                                                                                               |                                                                                    |
| International Patent Classification (IPC) or both national classification and IPC<br><b>B60W 50/08(2006.01)i, B60R 25/00(2006.01)i, B60R 16/02(2006.01)i</b> |                                                                                    |
| Applicant<br><b>SIMON, SASCHA</b>                                                                                                                            |                                                                                    |

## 1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

## 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.  
For further options, see Form PCT/ISA/220.

|                                                                                                                                                                                                                                                                                                                                          |                                                                             |                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>Name and mailing address of the ISA/KR<br/>International Application Division<br/>Korean Intellectual Property Office<br/>189 Chosung-ro, Seo-gu, Daejeon<br/>Metropolitan City, 302-701, Republic of Korea<br/>Facsimile No. +82-42-472-7140</p> | <p>Date of completion of this opinion</p> <p>02 April 2014 (02.04.2014)</p> | <p>Authorized officer</p> <p>SUNG, Ho Kwon</p> <p>Telephone No. +82-42-481-5580</p>  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US2013/076410

Box No. 1 Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

- ☒ the international application in the language in which it was filed
- ☐ a translation of the international application into \_\_\_\_\_ which is the language of a translation furnished for the purposes of international search (Rules 13.3(a) and 23.1(b))

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

a. (means)

- ☐ on paper
- ☐ in electronic form

b. (time)

- ☐ in the international application as filed.
- ☐ together with the international application in electronic form.
- ☐ subsequently to this Authority for the purposes of search.

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
**PCT/US2013/076410**

**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability:  
citations and explanations supporting such statement**

**1. Statement**

|                               |        |      |     |
|-------------------------------|--------|------|-----|
| Novelty (N)                   | Claims | 1-42 | YES |
|                               | Claims | NONE | NO  |
| Inventive step (IS)           | Claims | 1-42 | YES |
|                               | Claims | NONE | NO  |
| Industrial applicability (IA) | Claims | 1-42 | YES |
|                               | Claims | NONE | NO  |

**2. Citations and explanations :**

Reference is made to the following documents:

- ✓D1: US 7136828 B1 (ALLEN et al.) 14 November 2006
- D2: WO 03-095276 A1 (COTTY, DARRYL EDWARD ALBERT) 20 November 2003
- D3: JP 10-260241 A (HONDA MOTOR CO., LTD.) 29 September 1998
- ✓D4: US 2003-0029345 A1 (TIERNAN et al.) 13 February 2003
- D5: EP 0461888 A2 (EXXON RESEARCH AND ENGINEERING COMPANY)  
18 December 1991

**1. Novelty and Inventive Step**

**1.1 Independent Claim 1**

The subject matter of claim 1 differs from these prior art documents D1-D5 in that a device of claim 1 comprises a field-detecting component and a comparing component, wherein the field-detecting component is operable to detect a second one of an electric field, a magnetic field, and electro-magnetic field and to generate a second detected field signature, and wherein the comparing component is operable to generate a comparison signal based on a comparison of a detected field signature and the second detected field signature. And it is not obvious to a person skilled in the art by the documents D1-D5, taken alone or in combination.

Therefore, claim 1 meets the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

Continued on Supplemental Box

Form PCT/ISA/237 (Box No. V) (July 2011)



WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
**PCT/US2013/076410**

**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient,  
Continuation of: Box No. V

**1.2 Dependent Claims 2-7**

Claims 2-7 are dependent on claim 1 directly or indirectly, and therefore meet the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

**1.3 Independent Claim 8**

Claim 8 relates to a method, and it has the same technical features as claim 1. Thus, the same reasoning applies to claim 8. Therefore, claim 8 meets the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

**1.4 Dependent Claims 9-14**

Claims 9-14 are dependent on claim 8 directly or indirectly, and therefore meet the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

**1.5 Independent Claim 15**

Claim 15 relates to a non-transitory, tangible, computer-readable media having computer-readable instructions stored thereon, and it has the same technical features as claim 1. Thus, the same reasoning applies to claim 15. Therefore, claim 15 meets the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

**1.6 Dependent Claims 16-21**

Claims 16-21 are dependent on claim 15 directly or indirectly, and therefore meet the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

Continued on The Next Page

Form PCT/ISA/237 (Supplemental Box) (July 2011)

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
**PCT/US2013/076410**

**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.  
Continuation of: Previous Page

**1.7 Independent Claim 22**

The subject matter of claim 22 differs from these prior art documents D1-D5 in that a device of claim 22 comprises a field-detecting component and a comparing component, wherein the field-detecting component is operable to detect an electric field, a magnetic field, and an electro-magnetic field, and wherein the comparing component is operable to generate a comparison signal based on a comparison of a detected field signature and a first plurality of signatures corresponding to electric fields, a second plurality of signatures corresponding to magnetic fields, and a third plurality of signatures corresponding to electro-magnetic fields. And it is not obvious to a person skilled in the art by the documents D1-D5, taken alone or in combination.

Therefore, claim 22 meets the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

**1.8 Dependent Claims 23-28**

Claims 23-28 are dependent on claim 22 directly or indirectly, and therefore meet the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

**1.9 Independent Claim 29**

Claim 29 relates to a method, and it has the same technical features as claim 22. Thus, the same reasoning applies to claim 29. Therefore, claim 29 meets the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

**1.10 Dependent Claims 30-35**

Claims 30-35 are dependent on claim 29 directly or indirectly, and therefore meet the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

Continued on The Next Page

Form PCT/ISA/237 (Supplemental Box) (July 2011)

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
**PCT/US2013/076410**

**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.  
Continuation of: Previous Page

1.11 Independent Claim 36

Claim 36 relates to a non-transitory, tangible, computer-readable media having computer-readable instructions stored thereon, and it has the same technical features as claim 22. Thus, the same reasoning applies to claim 36. Therefore, claim 36 meets the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

1.12 Dependent Claims 37-42

Claims 37-42 are dependent on claim 36 directly or indirectly, and therefore meet the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

2. Industrial Applicability

Claims 1-42 are industrially applicable under PCT Article 33(4).

## PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:  
JOHN WHELAN2315 HOLLOWING POINT RD PRINCE FREDERICK, MD  
20678 USA**PCT****NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL SEARCH REPORT AND  
THE WRITTEN OPINION OF THE INTERNATIONAL  
SEARCHING AUTHORITY, OR THE DECLARATION**

(PCT Rule 44.1)

Date of mailing  
(day/month/year) 09 April 2014 (09.04.2014)Applicant's or agent's file reference  
30303**FOR FURTHER ACTION** See paragraphs 1 and 4 belowInternational application No.  
**PCT/US2013/076426**International filing date  
(day/month/year) 19 December 2013 (19.12.2013)Applicant  
**SIMON, SASCHA**

- 1.
- ☒
- The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

**Filing of amendments and statement under Article 19:**

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

**When?** The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.**Where?** Directly to the International Bureau of WIPO, 34 chemin des Colombettes  
1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70**For more detailed instructions, see PCT Applicant's Guide, International Phase, paragraphs 9.004, 9.011.**

- 2.
- ☐
- The applicant is hereby notified that no international search report will be established and that the declaration under Article 17C(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

- 3.
- ☐
- With regard to any protest**
- against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
- 
- ☐
- the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made**4. Reminders**

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90bis.1 and 90bis.3).Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.For details about the applicable time limits, Office by Office, see [www.wipo.int/pct/en/texts/time\\_limits.html](http://www.wipo.int/pct/en/texts/time_limits.html) and the PCT Applicant's Guide, National Chapters.

Name and mailing address of the ISA/KR

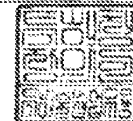
International Application Division  
Korean Intellectual Property Office  
189 Cheongseon-ro, Songje, Daejeon Metropolitan City, 302-701,  
Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

COMMISSIONER

Telephone No. 82-42-481-5875



Form PCT/ISA/226 (July 2010)

\* Attention

Copies of the documents cited in the international search report can be searched in the following Korean Intellectual Property Office English website for six months(expire date : **2014.10.10** ) from the date of mailing of the international search report.

<http://www.kipo.go.kr/en/> => PCT Services => PCT Services

ID : PCT international application number

PW : **KXFK2M2H**

Inquiries related to PCT International Search Report or Written Opinion prepared by KIPO as an International Searching Authority can be answered not only by KIPO but also through IPKC (Intellectual Property Korea Center), located in Vienna, VA, which functions as a PCT Help Desk for PCT applicants.

Homepage: <http://www.ipkcenter.com>

Email: [ipkc@ipkcenter.com](mailto:ipkc@ipkcenter.com)

Notes to Form PCT/ISA/220 (July 2010)

## PATENT COOPERATION TREATY

PCT/US2013/076426

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

|                                                           |                                                                                            |                                                                            |
|-----------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Applicant's or agent's file reference<br>30303            | <b>FOR FURTHER ACTION</b> see Form PCT/ISA/220 as well as, where applicable, item 5 below. |                                                                            |
| International application No.<br><b>PCT/US2013/076426</b> | International filing date (day/month/year)<br><b>19 December 2013 (19.12.2013)</b>         | (Earliest) Priority Date (day/month/year)<br>21 December 2012 (21.12.2012) |
| Applicant<br><b>SIMON, SASCHA</b>                         |                                                                                            |                                                                            |

This International search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International search report consists of a total of 3 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of:

☒ the international application in the language in which it was filed

☐ a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box No. II)

3. ☐ **Unity of invention is lacking** (See Box No. III)

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 5

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

Form PCT/ISA/210 (first sheet) (July 2009)

## INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/US2013/076426**

| <b>A. CLASSIFICATION OF SUBJECT MATTER</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                             |                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| B60R 25/00(2006.01)i, B60R 25/24(2013.01)i, B60W 50/08(2006.01)i, B60R 16/02(2006.01)i                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                             |                                                                                         |
| According to International Patent Classification (IPC) or to both national classification and IPC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                             |                                                                                         |
| <b>B. FIELDS SEARCHED</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                             |                                                                                         |
| Minimum documentation searched (classification system followed by classification symbols)<br>B60R 25/00; B60R 25/10; G06F 7/00; H04W 16/20; B60Q 1/00; G01R 35/00; B60R 25/24; B60W 50/08; B60R 16/02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                             |                                                                                         |
| Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched<br>Korean utility models and applications for utility models<br>Japanese utility models and applications for utility models                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                             |                                                                                         |
| Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)<br>eKOMPASS(KIPO Internal) & Keywords: database, parameter, detect, geodetic location and network                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                             |                                                                                         |
| <b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                             |                                                                                         |
| Category*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Citation of document, with indication, where appropriate, of the relevant passages                                          | Relevant to claim No.                                                                   |
| X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | US 2009-0309709 A1 (HEVACQUEA et al.) 17 December 2009<br>See paragraphs [0040], [0059]-[0068], [0106]-[0126] and figure 6. | 1-15                                                                                    |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | US 2004-0257208 A1 (HJANG et al.) 23 December 2004<br>See paragraphs [0010]-[0011] and figure 1.                            | 1-15                                                                                    |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | US 2011-0301795 A1 (FAHLING, BRYAN MARC) 08 December 2011<br>See paragraphs [0004]-[0009] and figure 2.                     | 1-15                                                                                    |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | US 2006-0095153 A1 (OPSTERLING et al.) 20 April 2006<br>See paragraphs [0005]-[0008] and figure 1.                          | 1-15                                                                                    |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | US 2011-0160654 A1 (KETAKI, NISHIAI) 14 July 2011<br>See paragraph [0017] and figures 2A-2C.                                | 1-15                                                                                    |
| <input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                             |                                                                                         |
| * Special categories of cited documents:<br>"A" document defining the general state of the art which is not considered to be of particular relevance<br>"E" earlier application or patent but published on or after the international filing date<br>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)<br>"O" document referring to an oral disclosure, use, exhibition or other means<br>"P" document published prior to the international filing date but later than the priority date claimed<br>"I" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention<br>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone<br>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art<br>"&" document member of the same patent family |                                                                                                                             |                                                                                         |
| Date of the actual completion of the international search<br><b>08 April 2014 (08.04.2014)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                             | Date of mailing of the international search report<br><b>09 April 2014 (09.04.2014)</b> |
| Name and mailing address of the ISA/KR<br>International Application Division<br>Korean Intellectual Property Office<br>189 Choongno-ro, Seong-gu, Daegjeon Metropolitan City, 302-701,<br>Republic of Korea<br>Facsimile No. +82-42 472-7140                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                             | Authorized officer<br>HAM, Joong Hyun<br>Telephone No. +82-42-481-5458                  |

Form PCT/ISA/210 (second sheet) (July 2009)

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2013/076426**

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|----------------------------------------|------------------|-------------------------|------------------|
| US 2009-0309700 A1                     | 17/12/2009       | EP 2255448 A1           | 01/12/2010       |
|                                        |                  | EP 2255448 A1           | 30/05/2012       |
|                                        |                  | ES 2012-0139760 A1      | 07/08/2012       |
|                                        |                  | ES 8115656 B2           | 14/02/2012       |
|                                        |                  | ES 8610590 B2           | 17/12/2013       |
|                                        |                  | WO 2009-108719 A1       | 03/09/2009       |
| US 2004-0257208 A1                     | 23/12/2004       | None                    |                  |
| US 2011-0301795 A1                     | 08/12/2011       | US 2011-0298422 A1      | 08/12/2011       |
|                                        |                  | US 2011-0302078 A1      | 08/12/2011       |
| US 2006-0085153 A1                     | 20/04/2006       | CN 100538512 C          | 09/09/2009       |
|                                        |                  | CN 1758044 A            | 12/04/2006       |
|                                        |                  | ES 7286047 B2           | 22/10/2007       |
| US 2011-0169654 A1                     | 14/07/2011       | ES 8115609 B2           | 14/02/2012       |

Form PCT/ISA/210 (patent family annex) (July 2009)



## PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:  
JOHN WHELAN  
  
2315 HALLLOWING POINT RD PRINCE FREDERICK, MD  
20678 USA

PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing  
(day/month/year) 09 April 2014 (09.04.2014)

Applicant's or agent's file reference  
30303

## FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/US2013/076426

International filing date (day/month/year)

19 December 2013 (19.12.2013)

Priority date(day/month/year)

21 December 2012 (21.12.2012)

International Patent Classification (IPC) or both national classification and IPC

B60R 25/00(2006.01); B60R 25/24(2013.01); B60W 50/08(2006.01); B60R 16/02(2006.01)

Applicant

SIMON, SASCHA

## 1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

## 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/KR  
International Application Division  
Korean Intellectual Property Office  
189 Cheongsa-ro, Seongju, Daegu  
Metropolitan City, 307-701, Republic of Korea  
Facsimile No. +82-42-472-7140

Date of completion of this opinion

08 April 2014 (08.04.2014)

Authorized officer

HAM, Jung Hyun

Telephone No. +82-42-481-5458



WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US2013/076426

Box No. 1 Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of :
  - ☒ the international application in the language in which it was filed
  - ☐ a translation of the international application into \_\_\_\_\_ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:
  - a. (means)
    - ☐ on paper
    - ☐ in electronic form
  - b. (time)
    - ☐ in the international application as filed.
    - ☐ together with the international application in electronic form.
    - ☐ subsequently to this Authority for the purposes of search.
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

Form PCT/ISA/237 (Box No. 1; July 2011)

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
**PCT/US2013/076426**

**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability:  
citations and explanations supporting such statement**

**1. Statement**

|                               |        |      |     |
|-------------------------------|--------|------|-----|
| Novelty (N)                   | Claims | 1-15 | YES |
|                               | Claims | NONE | NO  |
| Inventive step (IS)           | Claims | NONE | YES |
|                               | Claims | 1-15 | NO  |
| Industrial applicability (IA) | Claims | 1-15 | YES |
|                               | Claims | NONE | NO  |

**2. Citations and explanations :**

Reference is made to the following documents:

D1: US 2009-0309709 A1 (BEVACQUA et al.) 17 December 2009

**1. Novelty and Inventive Step**

**1.1 Independent Claim 1**

D1, which is considered to be the closest prior art to the subject matter of claim 1, discloses a vehicle security system for theft detection and vehicle location awareness and monitoring, comprising: a database of WiFi MAC (medium access control) configured to determine location based on access point MAC addresses visible to a WiFi receiver; a means of comparing locations of the vehicle received from a communication center (130) with stored geo-fence information; and a means of determining that the vehicle has moved beyond a geo-fence defined area (see paragraphs [0068],[0106],[0111] and figure 6).

Claim 1 differs from D1 in that it comprises a parameter-detecting component operable to detect a third parameter, to detect a fourth parameter and to generate a second detected parameter signature based on the third detected parameter and the fourth detected parameter, wherein a comparison component is operable to generate a comparison signal based on a comparison of the detected parameter signature and the second detected parameter signature. However, said feature would be easily conceived from the disclosure of D1 in that a rate of periodic updates of location at boxes (606,610) can depend on a speed of the vehicle (110) and an update rate can be based on the time which it takes the vehicle (110) to move a predetermined distance (see paragraph [0065]).

Accordingly, claim 1 would have been obvious over D1.

Therefore, claim 1 lacks an inventive step under PCT Article 33(3).

**1.2 Dependent Claims 2-5**

**1.2.1 Concerning Claim 2**

The additional feature of claim 2, characterized in that said parameter-detecting component is operable to detect the third parameter as a function over a period of time, would be easily conceived from the disclosure of D1 in that a rate of periodic updates of location at boxes

Continued on Supplemental Box

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
PCT/US2013/076426

Supplemental Box

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Continuation of : Box No. V

(606,610) can depend on a speed of the vehicle (110) and an update rate can be based on the time it takes the vehicle (110) to move a predetermined distance (see paragraph [0065]). Accordingly, claim 2 would have been obvious over D1. Therefore, claim 2 lacks an inventive step under PCT Article 33(3).

1.2.2 Concerning Claim 3

The additional feature of claim 3 is identical to the disclosure of D1 in a position location subsystem (230) such as a GPS receiver (see paragraph [0059]). Accordingly, claim 3 would have been obvious over D1. Therefore, claim 3 lacks an inventive step under PCT Article 33(3).

1.2.3 Concerning Claim 4

The additional feature of claim 4 is identical to the disclosure of D1 in a communications subsystem (340) to receive data indicative of the location of the vehicle from a monitoring system (105) via a wireless network (125) (see paragraph [0062]). Accordingly, claim 4 would have been obvious over D1. Therefore, claim 4 lacks an inventive step under PCT Article 33(3).

1.2.4 Concerning Claim 5

The additional feature of claim 5 is identical to the disclosure of D1 in that a communication center (130) can use data indicative of traffic patterns to predict a likely course for the vehicle being tracked (see paragraph [0126]). Accordingly, claim 5 would have been obvious over D1. Therefore, claim 5 lacks an inventive step under PCT Article 33(3).

1.3 Independent Claim 6

D1, which is considered to be the closest prior art to the subject matter of claim 6, discloses a method for theft detection and vehicle location awareness and monitoring, comprising steps of: providing a database of WiFi MAC (medium access control) configured to determine location based on access point MAC addresses visible to a WiFi receiver; detecting a speed of the vehicle (110); detecting the time which it takes the vehicle to move a predetermined distance (110); comparing locations of a vehicle received from a communication center (130) with stored geo-fence information; and determining that the vehicle has moved beyond a geo-fence defined area (see paragraphs [0068],[0106],[0111] and figure 6). Claim 6 differs from D1 in that it comprises a step of generating, via the parameter-detecting component, a second detected parameter signature based on the third detected parameter and the fourth detected parameter. However, said feature would be easily conceived from the disclosure of D1 in that a rate of periodic updates of location at boxes (606,610) can depend on a speed of the vehicle (110) and an update rate can be based on a time which it takes the vehicle (110) to move a predetermined distance (see paragraph [0065]). Accordingly, claim 6 would have been obvious over D1.

Continued on The Next Page

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WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

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PCT/US2013/076426

Supplemental Box

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Therefore, claim 6 lacks an inventive step under PCT Article 33(3).

1.4 Dependent Claims 7-10

1.4.1 Concerning Claim 7

The additional feature of claim 7, characterized in that detecting a third parameter comprises detecting the third parameter as a function over a period of time, would be easily conceived from the disclosure of D1 in that the rate of periodic updates of location at boxes (606,610) can depend on the speed of the vehicle (110) and the update rate can be based on the time which it takes the vehicle (110) to move a predetermined distance (see paragraph [0065]).

Accordingly, claim 7 would have been obvious over D1.

Therefore, claim 7 lacks an inventive step under PCT Article 33(3).

1.4.2 Concerning Claim 8

The additional feature of claim 8 is identical to the disclosure of D1 in a step of providing a position location subsystem (230) such as a GPS receiver (see paragraph [0059]).

Accordingly, claim 8 would have been obvious over D1.

Therefore, claim 8 lacks an inventive step under PCT Article 33(3).

1.4.3 Concerning Claim 9

The additional feature of claim 9 is identical to the disclosure of D1 in a step of providing a communications subsystem (340) to receive data indicative of the location of the vehicle from a monitoring system (105) via a wireless network (125) (see paragraph [0062]).

Accordingly, claim 9 would have been obvious over D1.

Therefore, claim 9 lacks an inventive step under PCT Article 33(3).

1.4.4 Concerning Claim 10

The additional feature of claim 10, concerning steps of generating, via a probability-assessing component, a probability of a vehicle mode based on the comparison signal; and detecting, via the parameter-detecting component, a fifth parameter when the generated probability is greater than a predetermined amount, would be easily conceived from the disclosure of D1 in that the communication center (130) can use data indicative of traffic patterns to predict a likely course for a vehicle being tracked and that the communication center (130) could use traffic analysis applications (see paragraph [0126]).

Accordingly, claim 10 would have been obvious over D1.

Therefore, claim 10 lacks an inventive step under PCT Article 33(3).

1.5 Independent Claim 11

D1, which is considered to be the closest prior art to the subject matter of claim 11, discloses a computer system (300), the computer to perform a method for theft detection and vehicle location awareness and monitoring, the method comprising steps of: providing a database of WiFi MAC (medium access control) configured to determine location based on access point

Continued on The Next Page

Form PCT/ISA/237 (Supplemental Box) (July 2011)

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
PCT/US2013/076426

Supplemental Box

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MAC addresses visible to a WiFi receiver; detecting a speed of the vehicle (110); detecting the time which it takes the vehicle to move a predetermined distance (110); comparing locations of a vehicle received from a communication center (130) with stored geo-fence information; and determining that the vehicle has moved beyond a geo-fence defined area (see paragraphs [0040],[0068],[0106],[0111] and figure 6).

Claim 11 differs from D1 in that it comprises a step of generating, via the parameter-detecting component, a second detected parameter signature based on the third detected parameter and the fourth detected parameter. However, said feature would be easily conceived from the disclosure of D1 in that a rate of periodic updates of location at boxes (606,610) can depend on a speed of the vehicle (110) and an update rate can be based on the time which it takes the vehicle (110) to move a predetermined distance (see paragraph [0065]).

Accordingly, claim 11 would have been obvious over D1.

Therefore, claim 11 lacks an inventive step under PCT Article 33(3).

1.6 Dependent Claims 12-15

1.6.1 Concerning Claim 12

The additional feature of claim 12, characterized in that detecting a third parameter comprises detecting the third parameter as a function over a period of time, would be easily conceived from the disclosure of D1 in that the rate of periodic updates of location at boxes (606,610) can depend on the speed of the vehicle (110) and the update rate can be based on the time which it takes the vehicle (110) to move a predetermined distance (see paragraph [0065]).

Accordingly, claim 12 would have been obvious over D1.

Therefore, claim 12 lacks an inventive step under PCT Article 33(3).

1.6.2 Concerning Claim 13

The additional feature of claim 13 is identical to the disclosure of D1 in a step of providing a position location subsystem (230) such as a GPS receiver (see paragraph [0059]).

Accordingly, claim 13 would have been obvious over D1.

Therefore, claim 13 lacks an inventive step under PCT Article 33(3).

1.6.3 Concerning Claim 14

The additional feature of claim 14 is identical to the disclosure of D1 in a step of providing a communications subsystem (340) to receive data indicative of the location of the vehicle from a monitoring system (105) via a wireless network (125) (see paragraph [0062]).

Accordingly, claim 14 would have been obvious over D1.

Therefore, claim 14 lacks an inventive step under PCT Article 33(3).

1.6.4 Concerning Claim 15

The additional feature of claim 15, concerning steps of generating, via a probability-assessing component, a probability of a vehicle mode based on the comparison signal, and detecting, via the parameter-detecting component, a fifth parameter when the generated probability is greater

Continued on The Next Page

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US2013/076426

Supplemental box

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than a predetermined amount, would be easily conceived from the disclosure of D1 in that the communication center (130) can use data indicative of traffic patterns to predict a likely course for a vehicle being tracked and that the communication center (130) could determine use traffic analysis applications (see paragraph [0126]).

Accordingly, claim 15 would have been obvious over D1.

Therefore, claim 15 lacks an inventive step under PCT Article 33(3).

2. Industrial Applicability

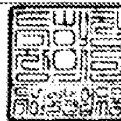
Claims 1-15 are industrially applicable under PCT Article 33(4).

## PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

|                                                                                     |  |                                                                                                                                                                                                                                                                            |  |
|-------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| To:<br>JOHN WHELAN<br><br>2315 HALLLOWING POINT RD PRINCE FREDERICK MD<br>20678 USA |  | <h1 style="margin: 0;">PCT</h1> <p style="margin: 0;"><b>NOTIFICATION OF TRANSMITTAL OF<br/>THE INTERNATIONAL SEARCH REPORT AND<br/>THE WRITTEN OPINION OF THE INTERNATIONAL<br/>SEARCHING AUTHORITY, OR THE DECLARATION</b></p> <p style="margin: 0;">(PCT Rule 44.1)</p> |  |
|                                                                                     |  | Date of mailing<br>(day/month/year) 09 April 2014 (09.04.2014)                                                                                                                                                                                                             |  |
| Applicant's or agent's file reference<br>30304                                      |  | <b>FOR FURTHER ACTION</b> See paragraphs 1 and 4 below                                                                                                                                                                                                                     |  |
| International application No.<br><b>PCT/US2013/076432</b>                           |  | International filing date<br>(day/month/year) 19 December 2013 (19.12.2013)                                                                                                                                                                                                |  |
| Applicant<br><b>SIMON, SASCHA</b>                                                   |  |                                                                                                                                                                                                                                                                            |  |

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.
- Filing of amendments and statement under Article 19:**  
 The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):
- When?** The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.
- Where?** Directly to the International Bureau of WIPO, 34 chemin des Colombettes  
 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70
- For more detailed instructions, see PCT Applicant's Guide, International Phase, paragraphs 9.004, 9.011.**
2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.
3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
- ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.
- ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.
4. **Reminders**
- The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.
- Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90bis.1 and 90bis.3).
- Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.
- In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.
- For details about the applicable time limits, Office by Office, see [www.wipo.int/pct/en/texts/time\\_limits.html](http://www.wipo.int/pct/en/texts/time_limits.html) and the PCT Applicant's Guide, National Chapters.

|                                                                                                                                                                                                                                         |                                                                            |                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Name and mailing address of the ISA/KR<br>International Application Division<br>Korean Intellectual Property Office<br>188 Cheongna-ro, Seongju, Daegu Metropolitan City, 302-701,<br>Republic of Korea<br>Facsimile No. 82-42-472-7146 | Authorized officer<br><br>COMMISSIONER<br><br>Telephone No. 82-42-481-5875 |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|---------------------------------------------------------------------------------------|

Form PCT/ISA/220 (July 2016)



\* Attention

Copies of the documents cited in the international search report can be searched in the following Korean Intellectual Property Office English website for six months(expire date : **2014.10.10** ) from the date of mailing of the international search report.

<http://www.kipo.go.kr/en/> => PCT Services => PCT Services

ID : PCT international application number  
PW : **GC63Y4WE**

Inquiries related to PCT International Search Report or Written Opinion prepared by KIPO as an International Searching Authority can be answered not only by KIPO but also through IPKC (Intellectual Property Korea Center), located in Vienna, VA, which functions as a PCT Help Desk for PCT applicants.

Homepage: <http://www.ipkcenter.com>

Email: [ipke@ipkcenter.com](mailto:ipke@ipkcenter.com)

Notes to Form PCT/ISA/220 (July 2010)

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

|                                                           |                                                                                                  |                                                                                   |
|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Applicant's or agent's file reference<br>10104            | <b>FOR FURTHER ACTION</b><br>see Form PCT/ISA/220<br>as well as, where applicable, item 5 below. |                                                                                   |
| International application No.<br><b>PCT/US2013/076432</b> | International filing date (day/month/year)<br><b>19 December 2013 (19.12.2013)</b>               | (Earliest) Priority Date (day/month/year)<br><b>21 December 2012 (21.12.2012)</b> |
| Applicant<br><b>SIMON, SASCHA</b>                         |                                                                                                  |                                                                                   |

This International search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International search report consists of a total of 3 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed  
☐ a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6(b)(i)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box No. II)

3. ☐ **Unity of invention is lacking** (See Box No. III)

4. With regard to the title,

- ☒ the text is approved as submitted by the applicant.  
☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

- ☒ the text is approved as submitted by the applicant.  
☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 2  
☒ as suggested by the applicant.  
☐ as selected by this Authority, because the applicant failed to suggest a figure.  
☐ as selected by this Authority, because this figure better characterizes the invention.  
b. ☐ none of the figures is to be published with the abstract.

Form PCT/ISA/210 (first sheet) (July 2009)

## INTERNATIONAL SEARCH REPORT

International application No.  
**PC/T/US2013/076432****A. CLASSIFICATION OF SUBJECT MATTER****H60R 25/00(2006.01); B60R 25/30(2013.01);**

According to International Patent Classification (IPC) or to both national classification and IPC.

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

H60R 25/00; G08B 25/08; B60R 21/01; G06F 7/00; B60R 21/32; H02J 7/00; H60L 1/00; B60R 21/0132; B60R 25/30

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eCOMPASS(KIPO internal) &amp; Keywords: vehicle, parameter, crash, and signal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                 | Relevant to claim No.                 |
|-----------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| X         | US 2008-0203814 A1 (KAMIYA, SHINJI) 28 August 2008<br>See paragraphs [0013], [0018]-[0020]; claim 4; and figure 2. | 1-3, 5-9, 11-15<br>17-18<br>1, 10, 16 |
| Y         |                                                                                                                    |                                       |
| Y         | ES 2009-003705G A1 (ERD, YANWICK) 05 February 2009<br>See abstract and paragraph [0032].                           | 1, 10, 16                             |
| A         | ES 2012-0125034 A1 (SHIMIZU, TAKASHI) 17 May 2012<br>See paragraphs [0017]-[0034] and figures 2-4.                 | 1-18                                  |
| A         | JP 2007-183865 A (DENSO CORP.) 19 July 2007<br>See claims 1-3 and figures 1-2.                                     | 1-18                                  |
| A         | US 5785347 A (MOLPH, et al.) 28 July 1998<br>See claims 1-5 and figures 5-7.                                       | 1-18                                  |

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"C" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"F" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;" document member of the same patent family

Date of the actual completion of the international search

08 April 2014 (08.04.2014)

Date of mailing of the international search report

**09 April 2014 (09.04.2014)**

Name and mailing address of the ISA/KR


 International Application Division  
 Korean Intellectual Property Office  
 159 Cheongso-ro, Seo-gu, Daejeon Metropolitan City, 305-380,  
 Republic of Korea

Facsimile No. +82-42-472-7140

Authorized officer

HAM, Jeong Hyeon

Telephone No. +82-42-481-5458



© new PC/T/US 67310 (second edition) (July 2009)

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.  
**PCT/US2013/076432**

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s)                                                                            | Publication<br>date                                                              |
|-------------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| US 2008-0203814 A1                        | 28/08/2008          | JP 04-245050 B2<br>JP 2008-207714 A<br>US 7657374 B2                                                  | 25/03/2000<br>11/09/2008<br>02/02/2010                                           |
| US 2009-0037056 A1                        | 05/02/2009          | EP 1957320 A1<br>EP 1957320 A4<br>GB 0524387 D0<br>GB 2433345 A<br>US 8155841 B2<br>WO 2007-087120 A1 | 20/08/2008<br>21/04/2010<br>11/01/2006<br>20/06/2007<br>10/04/2012<br>14/06/2007 |
| US 2012-0123624 A1                        | 17/05/2012          | CN 102463952 A<br>JP 05-177586 B2<br>JP 2012-101734 A<br>US 9609623 B2                                | 23/05/2012<br>03/04/2013<br>31/05/2012<br>03/12/2013                             |
| JP 2007-183865 A                          | 19/07/2007          | JP 4735267 B2                                                                                         | 27/07/2011                                                                       |
| US 5785347 A                              | 28/07/1998          | CN 1240394 A0<br>EP 0932529 A1<br>JP 2001-504770 A<br>KR 10-2000-0052673 A<br>WO 98-17508 A1          | 05/01/2000<br>10/10/2001<br>10/04/2001<br>25/08/2000<br>30/04/1998               |

Form PCT/ISA/210 (patent family annex) (July 2009)

## PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:  
JOHN WHELAN  
  
2315 HALLOWING POINT RD PRINCE FREDERICK MD  
20678 USA

PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing  
(day/month/year) 09 April 2014 (09.04.2014)

Applicant's or agent's file reference  
30304

## FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/US2013/076432

International filing date (day/month/year)

19 December 2013 (19.12.2013)

Priority date (day/month/year)

21 December 2012 (21.12.2012)

International Patent Classification (IPC) or both national classification and IPC

B60R 25/00(2006.01); B60R 25/30(2013.01)

Applicant

SIMON, SASCHA

## 1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability, citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

## 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

|                                                                                                                                                                                                                                                      |                                                                               |                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <p>Name and mailing address of the ISA/KR<br/>International Application Division<br/>Korean Intellectual Property Office<br/>189 Cheongseuro, Seongju, Daegu<br/>Metropolitan City, 362-761, Republic of Korea<br/>Facsimile No. +82-42-472-7140</p> | <p>Date of completion of this opinion<br/><br/>08 April 2014 (08.04.2014)</p> | <p>Authorized officer<br/><br/>HAM, Joong Hyun<br/><br/>Telephone No. +82-42-481-5458</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
**PCT/US2013/076432**

Box No. 1 Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

- ☒ the international application in the language in which it was filed  
☐ a translation of the international application into \_\_\_\_\_ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

a. (means)

- ☐ on paper  
☐ in electronic form

b. (time)

- ☐ in the international application as filed.  
☐ together with the international application in electronic form.  
☐ subsequently to this Authority for the purposes of search.

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
**PCT/US2013/076432**

**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability:  
citations and explanations supporting such statement**

**1. Statement**

|                               |        |      |     |
|-------------------------------|--------|------|-----|
| Novelty (N)                   | Claims | 1-18 | YES |
|                               | Claims | NONE | NO  |
| Inventive step (IS)           | Claims | NONE | YES |
|                               | Claims | 1-18 | NO  |
| Industrial applicability (IA) | Claims | 1-18 | YES |
|                               | Claims | NONE | NO  |

**2. Citations and explanations :**

Reference is made to the following documents:

D1: US 2008-0203814 A1 (KAMIYA, SHINJI) 28 August 2008  
D2: US 2009-0037056 A1 (ERB, YANNICK) 05 February 2009  
D3: US 2012-0123634 A1 (SHIMIZU, TAKASHI) 17 May 2012  
D4: JP 2007-183865 A (DENSO CORP.) 19 July 2007  
D5: US 5785347 A (ADOLPH et al.) 28 July 1998

**1. Novelty and Inventive Step**

**1.1 Independent Claim 1**

D1, which is considered to be the closest prior art to the subject matter of claim 1, discloses that an emergency report apparatus for a vehicle comprises a control circuit (2) performing an emergency report operation (see claim 4 and figure 2). This claim differs from D1 in that a device comprises a first detecting component operable to detect a first parameter and to generate a first detector signal based on the first detected parameter and a second detecting component operable to detect a second parameter and to generate a second detector signal based on the second detected parameter. However, this feature would be easily conceived from the disclosure of D1 in that the emergency report operation comprises a collision possibility determining unit determining that there is a possibility that the vehicle will collide with something in a normal operation mode and a collision determining unit to determine whether or not the vehicle has collided with something in a low-power consumption operation mode (see claim 4 and figure 2). Accordingly, this claim would have been obvious over D1. Therefore, claim 1 does not involve an inventive step under PCT Article 33(3).

Continued on Supplemental Box

Form PCT/ISA/237 (Box No. V) (July 2011)

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
**PCT/US2013/076432**

**Box No. VII Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:  
Claim 18 is contrary to PCT Rule 6.1(a) because claim 13 includes the subject matter of claim 18.

Form PCT/ISA/237 (Box No. VII) (July 2011)



WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
**PCT/US2013/076432**

Supplemental Box

In case the space in any of the preceding boxes is not sufficient,  
Continuation of: Box No. V

1.2 Dependent Claims 2-6

1.2.1 Concerning Claim 2

The additional feature of claim 2 would be easily conceived from the disclosure of D1 in that a pre-crash safety ECU (20) is connected with a camera (21), a millimeter wave radar (22), a vehicle speed sensor (23), a steering angle sensor (24), a brake control ECU (25), an air suspension ECU (26), and a seatbelt ECU (27) (see paragraph [0019]). Accordingly, this claim would have been obvious over D1. Therefore, claim 2 does not involve an inventive step under PCT Article 33(3).

1.2.2 Concerning Claim 3

The additional feature of claim 3, characterized in that the first detecting component is operable to detect, as the first parameter, a parameter associated with deployment of an airbag within the vehicle, is not explicitly disclosed in D1. However, this feature would be easily conceived from the disclosure of D1 in that when an airbag is expanded, the airbag ECU outputs an airbag expansion signal to the control circuit (2) (see paragraphs [0018],[0020]). Accordingly, this claim would have been obvious over D1. Therefore, claim 3 does not involve an inventive step under PCT Article 33(3).

1.2.3 Concerning Claim 4

The additional feature of claim 4, characterized in that the first detecting component is operable to detect, as the first parameter, acceleration along a single axis and to generate the first detector signal when the detected acceleration along the single axis is equal to or greater than a predetermined value, is not disclosed in D1. However, D2 discloses that a comparator (7) is configured to provide the start signal when the acceleration signal first exceeds the predetermined acceleration value (a0) (see paragraph [0052]). Accordingly, this claim would have been obvious over D1 in view of D2. Thus, claim 4 does not involve an inventive step under PCT Article 33(3).

1.2.4 Concerning Claim 5

The additional feature of claim 5 is identical to the feature of D1 in that the control circuit (2) causes a wireless communication device (3) to transmit an emergency report signal to a service center (12) through a radio communication network (see paragraph [0020]). Accordingly, this claim would have been obvious over D1. Therefore, claim 5 does not involve an inventive step under PCT Article 33(3).

Continued on The Next Page

Form PCT/ISA/237 (Supplemental Box) (July 2011)

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
PCT/US2013/076432

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.  
Continuation of: Previous Page

1.2.5 Concerning Claim 6

The additional feature of claim 6 is identical to the feature of D1 in switching an operation mode between the normal operation mode and the low-power consumption operation mode (see claim 4). Accordingly, this claim would have been obvious over D1. Therefore, claim 6 does not involve an inventive step under PCT Article 33(3).

1.3 Independent Claim 7

The same reasoning as in claim 1 applies to claim 7, which shares the same technical features as claim 1 and differs only in the category of invention. Accordingly, this claim would have been obvious over D1. Therefore, claim 7 does not involve an inventive step under PCT Article 33(3).

1.4 Dependent Claims 8-12

The additional features of claims 8-12 have the same technical features as in claims 2-6 respectively, and differ only in the category of invention.

Accordingly, claims 8-9,11-12 would have been obvious over D1, and claim 10 would have been obvious over D1 in view of D2.

Therefore, claims 8-12 do not involve an inventive step under PCT Article 33(3).

1.5 Independent Claim 13

D1, which is considered to be the closest prior art to the subject matter of claim 13, discloses that an emergency report apparatus for a vehicle comprises a control circuit constructed based on CPU (2) performing an emergency report operation and switching an operation mode between the normal operation mode and the low-power consumption operation mode (see paragraph [0013]; claim 4; and figure 2). This claim differs from D1 in that a non-transitory, tangible, computer-readable media comprises a first detecting component operable to detect a first parameter and to generate a first detector signal based on the first detected parameter and a second detecting component operable to detect a second parameter and to generate a second detector signal based on the second detected parameter. However, this feature would be easily conceived from the disclosure of D1 in that the emergency report operation comprises a collision possibility determining unit determining that there is a possibility that the vehicle will collide with something in a normal operation mode and a collision determining unit to determine whether or not the vehicle has collided with something in a low-power

Continued on The Next Page

Form PCT/ISA/237 (Supplemental Box) (July 2011)

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
**PCT/US2013/076432**

**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.  
Continuation of: Previous Page

consumption operation mode (see claim 4 and figure 2). Accordingly, this claim would have been obvious over D1. Therefore, claim 13 does not involve an inventive step under PCT Article 33(3).

**1.6 Dependent Claims 14-18**

The additional features of claims 14-18 have the same technical features as claims 2-6 respectively, and differ only in the category of invention.

Accordingly, claims 14-15, 17-18 would have been obvious over D1, and claim 16 would have been obvious over D1 in view of D2.

Therefore, claims 14-18 do not involve an inventive step under PCT Article 33(3).

(Note: claim 13 includes the subject matter of claim 18)

**2. Industrial Applicability**

Claims 1-18 are industrially applicable under PCT Article 33(4).

## PATENT COOPERATION TREATY

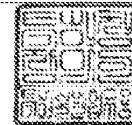
From the INTERNATIONAL SEARCHING AUTHORITY

|                                                                                  |                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| To:<br>WHELAN, JOHN<br><br>2315 HALLINGWORTH RD PRINCE FREDERICK MD<br>20678 USA | <h1>PCT</h1> <p><b>NOTIFICATION OF TRANSMITTAL OF<br/>THE INTERNATIONAL SEARCH REPORT AND<br/>THE WRITTEN OPINION OF THE INTERNATIONAL<br/>SEARCHING AUTHORITY, OR THE DECLARATION</b></p> <p>(PCT Rule 44.1)</p> |
| Applicant's or agent's file reference<br>30305                                   | Date of mailing<br>(day/month/year) 09 April 2014 (09.04.2014)                                                                                                                                                    |
| International application No.<br><b>PCT/US2013/076440</b>                        | International filing date<br>(day/month/year) <b>19 December 2013 (19.12.2013)</b>                                                                                                                                |
| Applicant<br><b>SIMON, SASCHA</b>                                                |                                                                                                                                                                                                                   |

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.
- Filing of amendments and statement under Article 19:**  
 The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):  
**When?** The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.  
**Where?** Directly to the International Bureau of WIPO, 34 chemin des Colombettes  
 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70  
**For more detailed instructions, see PCT Applicant's Guide, International Phase, paragraphs 9.004, 9.011.**
2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.
3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 46.2, the applicant is notified that:  
☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.  
☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.
4. **Reminders**  
 The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.
- Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90bis.1 and 90bis.3).
- Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices. In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.
- For details about the applicable time limits, Office by Office, see [www.wipo.int/pct/en/texts/time\\_limits.html](http://www.wipo.int/pct/en/texts/time_limits.html) and the PCT Applicant's Guide, National Chapters.

|                                                                                                                                                                                                                                          |                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| Name and mailing address of the ISA/KR<br>International Application Division<br>Korean Intellectual Property Office<br>189 Chonggye-ro, Seo-gu, Daejeon Metropolitan City, 302-701,<br>Republic of Korea<br>Facsimile No. 82-42-472-7140 | Authorized officer<br>COMMISSIONER<br>Telephone No. 82-42-481-8755 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|

Form PCT/ISA/220 (July 2010)



\* Attention

Copies of the documents cited in the international search report can be searched in the following Korean

## PATENT COOPERATION TREATY

PCT/US2013/076440

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

|                                                           |                                                                                               |                                                                                     |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Applicant's or agent's file reference<br>30305            | <b>FOR FURTHER ACTION</b> see Form PCT/ISA/226<br>as well as, where applicable, item 5 below. |                                                                                     |
| International application No.<br><b>PCT/US2013/076440</b> | International filing date ( <i>day/month/year</i> )<br><b>19 December 2013 (19.12.2013)</b>   | (Earliest) Priority Date ( <i>day/month/year</i> )<br>21 December 2012 (21.12.2012) |
| Applicant<br><b>SIMON, SASCHA</b>                         |                                                                                               |                                                                                     |

This International search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

☒ the international application in the language in which it was filed

☐ a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box No. II)

3. ☐ **Unity of invention is lacking** (See Box No. III)

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,

a. the figure of the **drawings** to be published with the abstract is Figure No. 6

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

Form PCT/ISA/210 (first sheet) (July 2009)

## INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/US2013/076440**

| <b>A. CLASSIFICATION OF SUBJECT MATTER</b><br><b>G01V 3/08(2006.01)I, H04W 88/02(2009.01)I</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                   |                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| According to International Patent Classification (IPC) or to both national classification and IPC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                   |                                                                                         |
| <b>B. FIELDS SEARCHED</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                   |                                                                                         |
| Minimum documentation searched (classification system followed by classification symbols)<br>G01V 3/08; H04Q 7/00; H04W 4/12; H04Q 7/20; H04W 4/02; H04W 88/02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                   |                                                                                         |
| Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched<br>Korean utility models and applications for utility models<br>Japanese utility models and applications for utility models                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                   |                                                                                         |
| Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)<br>eKOMPASS(KIPO internal) & Keywords: smartphone, location, detecting, database, signature, field, comparison                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                   |                                                                                         |
| <b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                   |                                                                                         |
| Category*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Citation of document, with indication, where appropriate, of the relevant passages                                                                | Relevant to claim No.                                                                   |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | US 2006-0080153 A1 (SHROYKAT, LADONID) 27 April 2006<br>See abstract, paragraphs [0003], [0004], [0016], [0027]-[0035], claim 1, and figures 4,6. | 1-20                                                                                    |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | US 2008-0287143 A1 (BARKS et al.) 20 November 2008<br>See abstract, paragraphs [0022],[0030]-[0033], claim 1, and figure 2.                       | 1-20                                                                                    |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | US 2004-0152471 A1 (MACHONNIJ et al.) 05 August 2004<br>See abstract, paragraphs [0042]-[0049], claim 1, and figure 1.                            | 1-20                                                                                    |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | US 2012-0298517 A1 (ZHANG, TSABA) 16 August 2012<br>See abstract, paragraphs [0012]-[0023], and figures 1,2.                                      | 1-20                                                                                    |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | JP 2009-177758 A (TAKASHI, TAKASHIMA) 06 August 2009<br>See abstract, paragraph [0004], and figure 1.                                             | 1-20                                                                                    |
| <input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                   |                                                                                         |
| * Special categories of cited documents:<br>"A" document defining the general state of the art which is not considered to be of particular relevance<br>"E" earlier application or patent but published on or after the international filing date<br>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)<br>"O" document referring to an oral disclosure, use, exhibition or other means<br>"P" document published prior to the international filing date but later than the priority date claimed<br>"F" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention<br>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone<br>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art<br>"&" document member of the same patent family |                                                                                                                                                   |                                                                                         |
| Date of the actual completion of the international search<br><b>08 April 2014 (08.04.2014)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                   | Date of mailing of the international search report<br><b>09 April 2014 (09.04.2014)</b> |
| Name and mailing address of the ISA/KR<br>International Application Division<br>Korean Intellectual Property Office<br>189 Chongrondo, Seong-gu, Daejeon Metropolitan City, 305-380,<br>Republic of Korea<br>Facsimile No. +82-42-472-7140                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                   | Authorized officer<br>SOHN, Byoung Cheol<br>Telephone No. +82-42-481-5489               |

Form PCT/ISA/210 (second sheet) (July 2009)

# INTERNATIONAL SEARCH REPORT

Information on patent family members:

International application No.

**PCT/US2013/076440**

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s)                                                                                                                                                                                                                                                                                                                                                                    | Publication<br>date                                                                                                                                                                                                                                                                  |
|-------------------------------------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US 2006-0080153 A1                        | 27/04/2006          | CN 101084696 A0<br>MX 2007005097 A<br>US 7433693 B2<br>WO 2006-047734 A1                                                                                                                                                                                                                                                                                                                      | 05/12/2007<br>16/07/2007<br>07/10/2008<br>04/05/2006                                                                                                                                                                                                                                 |
| US 2008-0287143 A1                        | 20/11/2008          | US 6975873 B1<br>US 7400892 B1                                                                                                                                                                                                                                                                                                                                                                | 13/12/2006<br>15/07/2008                                                                                                                                                                                                                                                             |
| US 2004-0152471 A1                        | 05/08/2004          | AU 2002-307149 A1<br>AU 2002-307149 A8<br>CA 2441764 A1<br>CA 2441764 C<br>CN 1528101 A<br>DE 60232505 B1<br>EP 1384386 A2<br>EP 1384386 B1<br>JP 2005-509136 A<br>JP 2010-160158A<br>KR 10-2004-0008148 A<br>KR 10-2008-0092390 A<br>MX PA03003011 A<br>US 2009-0221299 A1<br>US 2012-094692 A1<br>US 2013-005853 A1<br>US 7519372 B2<br>US 8369870 B2<br>WO 02-082802 A2<br>WO 02-082802 A3 | 21/10/2002<br>21/10/2002<br>17/10/2002<br>05/05/2012<br>08/09/2004<br>16/07/2009<br>28/01/2004<br>03/06/2009<br>07/04/2005<br>22/07/2010<br>28/01/2004<br>15/10/2008<br>17/02/2004<br>03/09/2009<br>19/04/2012<br>18/04/2013<br>14/04/2008<br>05/02/2013<br>17/10/2002<br>27/02/2003 |
| US 2012-0208317 A1                        | 16/08/2012          | US 2009-233589 A1<br>US 2012-231811 A1<br>US 8359001 B2<br>US 8478230 B2<br>US 8588730 B2                                                                                                                                                                                                                                                                                                     | 17/09/2009<br>13/09/2012<br>22/01/2013<br>02/07/2013<br>19/11/2013                                                                                                                                                                                                                   |
| JP 2008-177758 A                          | 06/08/2008          | None                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                      |

Form PCT/ISA/210 (patent family annex) (July 2009)



## PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:  
WHELAN, JOHN

2315 HALLOWING POINT RD PRINCE FREDERICK, MD  
20678 USA

PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing  
(day/month/year) 09 April 2014 (09.04.2014)

Applicant's or agent's file reference  
30305

## FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/US2013/076440

International filing date (day/month/year)

19 December 2013 (19.12.2013)

Priority date(day/month/year)

21 December 2012 (21.12.2012)

International Patent Classification (IPC) or both national classification and IPC

G01V 3/08(2006.01)i, H04W 88/02(2009.01)i

Applicant

SIMON, SASCHA

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

## 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66, this(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

|                                                                                                                                                                                                                                                                                                                                            |                                                                          |                                                                                                                                                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Name and mailing address of the ISA/KR<br/>International Application Division<br/>Korean Intellectual Property Office<br/>159 Cheongna-ro, Seongje, Daejeon<br/>Metropolitan City, 302-701, Republic of Korea<br/>Facsimile No. +82-42-472-7140</p>  | <p>Date of completion of this opinion<br/>08 April 2014 (08.04.2014)</p> | <p>Authorized officer<br/>SOHN, Byoung Cheol<br/>Telephone No. +82-42-481-5489</p>  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No  
**PCT/US2013/076440**

**Box No. I Basis of this opinion**

1. With regard to the **language**, this opinion has been established on the basis of:
- ☒ the international application in the language in which it was filed
  - ☐ a translation of the international application into \_\_\_\_\_ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:
- a. (means)
- ☐ on paper
  - ☐ in electronic form
- b. (time)
- ☐ in the international application as filed.
  - ☐ together with the international application in electronic form.
  - ☐ subsequently to this Authority for the purposes of search.
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
**PCT/US2013/076440**

**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability:  
citations and explanations supporting such statement**

**1. Statement**

|                               |        |      |     |
|-------------------------------|--------|------|-----|
| Novelty (N)                   | Claims | 1-20 | YES |
|                               | Claims | NONE | NO  |
| Inventive step (IS)           | Claims | 1-20 | YES |
|                               | Claims | NONE | NO  |
| Industrial applicability (IA) | Claims | 1-20 | YES |
|                               | Claims | NONE | NO  |

**2. Citations and explanations :**

Reference is made to the following documents:

D1: US 2006-0089153 A1 (SHEYNBLAT, LEONID) 27 April 2006  
D2: US 2008-0287143 A1 (BANKS et al.) 20 November 2008  
D3: US 2004-0152471 A1 (MACDONALD et al.) 05 August 2004  
D4: US 2012-0208517 A1 (ZOIJAR, TSABA) 16 August 2012  
D5: JP 2009-177758 A (TAKASHI, TAKASHIMA) 06 August 2009

**1. Novelty and Inventive Step**

**1.1 Claims 1-7**

The subject matter of independent claim 1 differs from these prior art documents D1-D5 in that: the database has stored a plurality of signatures corresponding to a plurality of fields; the accessing component operable to access one of the plurality of signatures, from the database; the field-detecting component operable to generate a detected field signature based on a detected first field; the comparing component operable to generate a comparison signal based on a comparison of the detected field signature and one of the plurality of signatures; and the identifying component operable to identify the first location based on the comparison signal. And it is not obvious to a person skilled in the art by the documents, taken alone or in combination. Therefore, claim 1 meets the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

Claims 2-7 are directly or indirectly dependent on claim 1, and therefore meet the requirements of PCT Article 33(2) and (3).

**1.2 Claims 8-14**

Continued on Supplemental Box

Form PCT/ISA/237 (Box No. V) (July 2011)

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

**PCT/US2013/076440**

**Box No. VII Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:

Claims 4, 3 of this application are not numbered consecutively in Arabic numerals. Therefore, claims 4, 3 do not meet PCT Article 6, under PCT Rule 6.1(b).

(Note: This written opinion has been established on the assumption that numbers 4, 3 each are numbers 3, 4 respectively)

Form PCT/ISA/237 (Box No. VII) (July 2011)

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
**PCT/US2013/076440**

**Supplemental Box**

In case the space in any of the preceding boxes is not sufficient.  
Continuation of: Box No. V

Independent claim 8, which relates to a method for use with a database having a plurality of signatures stored therein, shares the same technical features with claim 1 and differs only in the category of invention. Thus, the same reasoning applies to claim 8. Therefore, claim 8 is novel and involves an inventive step under PCT Article 33(2) and (3).

Claims 9-14 are directly or indirectly dependent on claim 8, and therefore meet the requirements of PCT Article 33(2) and (3).

**1.3 Claims 15-20**

Independent claim 15, which relates to a non-transitory, tangible, computer-readable media having computer-readable instructions therein, shares the same technical features with claim 1 and differs only in the category of invention. Thus, the same reasoning applies to claim 15. Therefore, claim 15 is novel and involves an inventive step under PCT Article 33(2) and (3).

Claims 16-20 are dependent on claim 15, and therefore meet the requirements of PCT Article 33(2) and (3).

**2. Industrial Applicability**

The invention as set forth in claims 1-20 is industrially applicable (PCT Article 33(4)).

| Electronic Acknowledgement Receipt   |                                                                                |
|--------------------------------------|--------------------------------------------------------------------------------|
| EFS ID:                              | 21076824                                                                       |
| Application Number:                  | 14072231                                                                       |
| International Application Number:    |                                                                                |
| Confirmation Number:                 | 1942                                                                           |
| Title of Invention:                  | System and Method for Identifying Vehicle by Utilizing Detected Magnetic Field |
| First Named Inventor/Applicant Name: | Sascha Simon                                                                   |
| Customer Number:                     | 54671                                                                          |
| Filer:                               | John T. Whelan                                                                 |
| Filer Authorized By:                 |                                                                                |
| Attorney Docket Number:              | APIO-ID                                                                        |
| Receipt Date:                        | 29-DEC-2014                                                                    |
| Filing Date:                         | 05-NOV-2013                                                                    |
| Time Stamp:                          | 15:38:23                                                                       |
| Application Type:                    | Utility under 35 USC 111(a)                                                    |

### Payment information:

|                        |    |
|------------------------|----|
| Submitted with Payment | no |
|------------------------|----|

### File Listing:

| Document Number | Document Description | File Name            | File Size(Bytes)/<br>Message Digest      | Multi Part /.zip | Pages (if appl.) |
|-----------------|----------------------|----------------------|------------------------------------------|------------------|------------------|
| 1               | Transmittal Letter   | ApioVehicleIDIDS.pdf | 325608                                   | no               | 2                |
|                 |                      |                      | 0fd503ee2fa76a17035f49535b901a70496d6fd2 |                  |                  |

### Warnings:

### Information:

|                                                 |                                                    |                          |                                                      |    |    |
|-------------------------------------------------|----------------------------------------------------|--------------------------|------------------------------------------------------|----|----|
| 2                                               | Information Disclosure Statement (IDS) Form (SB08) | ApioVehicleIDIDSForm.pdf | 1865651<br>5751a4759905569416ef5b21ec236c409f8c49c7  | no | 3  |
| Warnings:                                       |                                                    |                          |                                                      |    |    |
| Information:                                    |                                                    |                          |                                                      |    |    |
| This is not an USPTO supplied IDS fillable form |                                                    |                          |                                                      |    |    |
| 3                                               | Foreign Reference                                  | WO03095276.pdf           | 4868911<br>953447499eca9d929e306fc03c231d712c4ade3d  | no | 7  |
| Warnings:                                       |                                                    |                          |                                                      |    |    |
| Information:                                    |                                                    |                          |                                                      |    |    |
| 4                                               | Foreign Reference                                  | EP0461888.pdf            | 5408315<br>ca578eb54c17207e87c802e1cd3ec5a1e218872f  | no | 8  |
| Warnings:                                       |                                                    |                          |                                                      |    |    |
| Information:                                    |                                                    |                          |                                                      |    |    |
| 5                                               | Foreign Reference                                  | JP2009177758.pdf         | 254980<br>7d7f069066e60e3a2f0cefcd6cd6b0027156bc     | no | 2  |
| Warnings:                                       |                                                    |                          |                                                      |    |    |
| Information:                                    |                                                    |                          |                                                      |    |    |
| 6                                               | Foreign Reference                                  | JP2007183865Abs.pdf      | 350749<br>2c27431b9f8f1f9f2e99a855997d84d81b21f76e   | no | 2  |
| Warnings:                                       |                                                    |                          |                                                      |    |    |
| Information:                                    |                                                    |                          |                                                      |    |    |
| 7                                               | Foreign Reference                                  | JP10260241Abs.pdf        | 303597<br>0fb876f228b302dd69beeb897cf36931da4ec0e8   | no | 2  |
| Warnings:                                       |                                                    |                          |                                                      |    |    |
| Information:                                    |                                                    |                          |                                                      |    |    |
| 8                                               | Other Reference-Patent/App/Search documents        | SearchReport410.pdf      | 2114160<br>a7d23c53591421d36e027e8542a5a02cfe7a04f   | no | 11 |
| Warnings:                                       |                                                    |                          |                                                      |    |    |
| Information:                                    |                                                    |                          |                                                      |    |    |
| 9                                               | Other Reference-Patent/App/Search documents        | SearchReport426.pdf      | 2576413<br>f9c65aac9d495ff663952610883374c96acd6aaf  | no | 12 |
| Warnings:                                       |                                                    |                          |                                                      |    |    |
| Information:                                    |                                                    |                          |                                                      |    |    |
| 10                                              | Other Reference-Patent/App/Search documents        | SearchReport432.pdf      | 2226280<br>d45e783b6d39635705527d5946f8940dccc0af861 | no | 12 |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                             |                     |                                         |    |    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|---------------------|-----------------------------------------|----|----|
| <b>Warnings:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                             |                     |                                         |    |    |
| <b>Information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                             |                     |                                         |    |    |
| 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Other Reference-Patent/App/Search documents | SearchReport440.pdf | 1672535                                 | no | 10 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                             |                     | dbef954476663f91bc3f5e9a9a1c13cd974649c |    |    |
| <b>Warnings:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                             |                     |                                         |    |    |
| <b>Information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                             |                     |                                         |    |    |
| <b>Total Files Size (in bytes):</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                             |                     | 21967199                                |    |    |
| <p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b><br/> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b><br/> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b><br/> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> |                                             |                     |                                         |    |    |



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

.....  
In re Patent Application of:  
Sascha Simon

Application No.: 14/072,231

Confirmation No.: 1942

Filed: 11/05/2013

Art Unit: 2857

For: SYSTEM AND METHOD FOR IDENTIFYING  
VEHICLE BY UTILIZING DETECTED  
MAGNETIC FIELD  
.....

Examiner: Schechter, Andrew M

**INFORMATION DISCLOSURE STATEMENT (IDS)**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Commissioner:

Pursuant to 37 CFR 1.56, 1.97 and 1.98, the attention of the Patent and Trademark Office is hereby directed to the references listed on the attached PTO/SB/08a and PTO/SB/08b. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

In accordance with 37 CFR 1.97(g), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made or that no other material information as defined in 37 CFR 1.56(a) exists. In accordance with 37 CFR 1.97(h), the filing of this Information Disclosure Statement shall not be construed to be an admission that any patent, publication or other information referred to therein is "prior art" for this invention unless specifically designated as such.

It is submitted that the Information Disclosure Statement is in compliance with 37 CFR 1.98 and the Examiner is respectfully requested to consider the listed reference.

Dated: December 29, 2014

Respectfully submitted,

By\_\_\_\_/John T. Whelan/\_\_\_\_\_  
John T. Whelan  
Reg. No. 32,448  
Attorney For Applicant



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

## NOTICE OF ALLOWANCE AND FEE(S) DUE

54671 7590 03/25/2016  
The Law Office of John T. Whelan, LLC  
2315 Hallowing Point Road  
Prince Frederick, MD 20678

EXAMINER

RAYMOND, EDWARD

ART UNIT PAPER NUMBER

2857

DATE MAILED: 03/25/2016

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

14/072,231

11/05/2013

Sascha Simon

APIO-ID

1942

TITLE OF INVENTION: System and Method for Identifying Vehicle by Utilizing Detected Magnetic Field

| APPLN. TYPE    | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE   |
|----------------|---------------|---------------|---------------------|----------------------|------------------|------------|
| nonprovisional | SMALL         | \$480         | \$0                 | \$0                  | \$480            | 06/27/2016 |

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.**

**THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.**

### HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**

## PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** **Mail Stop ISSUE FEE**  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, Virginia 22313-1450**  
or **Fax** **(571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

54671 7590 03/25/2016  
The Law Office of John T. Whelan, LLC  
2315 Hallowing Point Road  
Prince Frederick, MD 20678

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

**Certificate of Mailing or Transmission**

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

|                    |
|--------------------|
| (Depositor's name) |
| (Signature)        |
| (Date)             |

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 14/072,231      | 11/05/2013  | Sascha Simon         | APIO-ID             | 1942             |

TITLE OF INVENTION: System and Method for Identifying Vehicle by Utilizing Detected Magnetic Field

| APPLN. TYPE    | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE   |
|----------------|---------------|---------------|---------------------|----------------------|------------------|------------|
| nonprovisional | SMALL         | \$480         | \$0                 | \$0                  | \$480            | 06/27/2016 |

| EXAMINER        | ART UNIT | CLASS-SUBCLASS |
|-----------------|----------|----------------|
| RAYMOND, EDWARD | 2857     | 702-065000     |

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively, 1 \_\_\_\_\_
- (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 \_\_\_\_\_
- 3 \_\_\_\_\_

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

**NOTE:** Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

**NOTE:** If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

**NOTE:** Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature \_\_\_\_\_

Date \_\_\_\_\_

Typed or printed name \_\_\_\_\_

Registration No. \_\_\_\_\_



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO.                       | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---------------------------------------|-------------|----------------------|---------------------|------------------|
| 14/072,231                            | 11/05/2013  | Sascha Simon         | APIO-ID             | 1942             |
| 54671                                 | 7590        | 03/25/2016           | EXAMINER            |                  |
| The Law Office of John T. Whelan, LLC |             |                      | RAYMOND, EDWARD     |                  |
| 2315 Hallowing Point Road             |             |                      | ART UNIT            |                  |
| Prince Frederick, MD 20678            |             |                      | PAPER NUMBER        |                  |

2857

DATE MAILED: 03/25/2016

## Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

## OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

### Privacy Act Statement

**The Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

|                               |                                      |                                      |                                                  |
|-------------------------------|--------------------------------------|--------------------------------------|--------------------------------------------------|
| <b>Notice of Allowability</b> | <b>Application No.</b><br>14/072,231 | <b>Applicant(s)</b><br>SIMON, SASCHA |                                                  |
|                               | <b>Examiner</b><br>EDWARD RAYMOND    | <b>Art Unit</b><br>2857              | <b>AIA (First Inventor to File) Status</b><br>No |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to IDS filed 12/29/14.  
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on \_\_\_\_\_.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_\_; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are 1-42. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see [http://www.uspto.gov/patents/init\\_events/pph/index.jsp](http://www.uspto.gov/patents/init_events/pph/index.jsp) or send an inquiry to [PPHfeedback@uspto.gov](mailto:PPHfeedback@uspto.gov).
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

**Certified copies:**

- a) ☐ All    b) ☐ Some    \*c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.  
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.  
**Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |                                                                                                                              |                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                  | 5. <input type="checkbox"/> Examiner's Amendment/Comment                             |
| 2. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br>Paper No./Mail Date <u>20141229</u> | 6. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| 3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material                   | 7. <input type="checkbox"/> Other _____.                                             |
| 4. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____.                                       |                                                                                      |

|  |  |
|--|--|
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|--|--|

### DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.

#### ***Allowable Subject Matter***

2. **Claims 1-42** are allowed. The claims were examined for subject matter patentability under 101 and Examiner found the claims to be eligible in light of *Alice*.

3. The following is an examiner's statement of reasons for allowance: U.S. Patent Application Publication Number 2008/0040004 A1 to Breed teach a system and method for preventing accidents. U.S. Patent Number 9,286,783 B1 to Teller et al. teach a device and method for monitoring the presence of items and issuing an alert if an item is not detected. The prior art of record does not teach an identifying component operable to identify one of an item and a location based on the comparison signal, wherein said field-detecting component is further operable to detect a second one of an electric field, a magnetic field and an electro-magnetic field and to generate a second detected field signature based on the detected second one of an electric field, a magnetic field and an electro-magnetic field, and wherein said comparing component is operable to generate the comparison signal based on a comparison of the detected field signature and the second detected field signature.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."



***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent Application Publication Number 2008/0040004 A1 to Breed teach a system and method for preventing accidents. U.S. Patent Number 9,286,783 B1 to Teller et al. teach a device and method for monitoring the presence of items and issuing an alert if an item is not detected.

***Contact Information***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to EDWARD RAYMOND whose telephone number is (571)272-2221. The examiner can normally be reached on M-F 8:30-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Schechter can be reached on 571-272-2302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Edward Raymond/  
Primary Examiner  
Art Unit 2857

er

|                                   |                                       |                                                             |             |
|-----------------------------------|---------------------------------------|-------------------------------------------------------------|-------------|
| <b>Notice of References Cited</b> | Application/Control No.<br>14/072,231 | Applicant(s)/Patent Under<br>Reexamination<br>SIMON, SASCHA |             |
|                                   | Examiner<br>EDWARD RAYMOND            | Art Unit<br>2857                                            | Page 1 of 1 |

**U.S. PATENT DOCUMENTS**

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| <b>Search Notes</b><br><br> | <b>Application/Control No.</b><br><br>14072231 | <b>Applicant(s)/Patent Under Reexamination</b><br><br>SIMON, SASCHA |
|                                                                                                              | <b>Examiner</b><br><br>EDWARD RAYMOND          | <b>Art Unit</b><br><br>2857                                         |

| CPC- SEARCHED                                    |           |          |
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| Symbol                                           | Date      | Examiner |
| B60R25/24; A61B5/0022; A61B5/1118; A61B2560/0214 | 3/21/2016 | er       |

| CPC COMBINATION SETS - SEARCHED |      |          |
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| Class                      | Subclass                       | Date      | Examiner |
| 702                        | 65, 64, 150, 155, 182-185, 188 | 3/21/2016 | er       |

| SEARCH NOTES                            |           |          |
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| Performed an East Search (see attached) | 3/21/2016 | er       |

| INTERFERENCE SEARCH     |                         |           |          |
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| <b>Issue Classification</b><br> | <b>Application/Control No.</b><br>14072231 | <b>Applicant(s)/Patent Under Reexamination</b><br>SIMON, SASCHA |  |
|                                                                                                                  | <b>Examiner</b><br>EDWARD RAYMOND          | <b>Art Unit</b><br>2857                                         |  |

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| NONE                                               |            | <b>Total Claims Allowed:</b> |                   |
| (Assistant Examiner)                               | (Date)     | 42                           |                   |
| /EDWARD RAYMOND/<br>Primary Examiner.Art Unit 2857 | 03/21/2016 | O.G. Print Claim(s)          | O.G. Print Figure |
| (Primary Examiner)                                 | (Date)     | 1                            | 4                 |







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CONFIRMATION NO. 1942

| SERIAL NUMBER                                                                                                                                                                                                                                                                                                                                                                                                                               | FILING or 371(c)<br>DATE                                                                                          | CLASS                                        | GROUP ART UNIT          | ATTORNEY DOCKET<br>NO.                                       |                     |                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------|--------------------------------------------------------------|---------------------|---------------------------|
| 14/072,231                                                                                                                                                                                                                                                                                                                                                                                                                                  | 11/05/2013                                                                                                        | 702                                          | 2857                    | APIO-ID                                                      |                     |                           |
| <b>APPLICANTS</b><br><b>INVENTORS</b><br>Sascha Simon, Warwick, NY;<br><b>** CONTINUING DATA *****</b><br>This appln claims benefit of 61/740,814 12/21/2012<br>and claims benefit of 61/740,831 12/21/2012<br>and claims benefit of 61/740,851 12/21/2012<br>and claims benefit of 61/745,677 12/24/2012<br><b>** FOREIGN APPLICATIONS *****</b><br><b>** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **</b> SMALL ENTITY **<br>11/21/2013 |                                                                                                                   |                                              |                         |                                                              |                     |                           |
| Foreign Priority claimed                                                                                                                                                                                                                                                                                                                                                                                                                    | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                                               | <input type="checkbox"/> Met after Allowance | <b>STATE OR COUNTRY</b> | <b>SHEETS DRAWINGS</b>                                       | <b>TOTAL CLAIMS</b> | <b>INDEPENDENT CLAIMS</b> |
| 35 USC 119(a-d) conditions met                                                                                                                                                                                                                                                                                                                                                                                                              | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                                               | er                                           | NY                      | 10                                                           | 42                  | 6                         |
| Verified and                                                                                                                                                                                                                                                                                                                                                                                                                                | /EDWARD RAYMOND/<br>Examiner's Signature                                                                          | Initials                                     |                         |                                                              |                     |                           |
| Acknowledged                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                   |                                              |                         |                                                              |                     |                           |
| <b>ADDRESS</b><br>The Law Office of John T. Whelan, LLC<br>2315 Hallowing Point Road<br>Prince Frederick, MD 20678<br>UNITED STATES                                                                                                                                                                                                                                                                                                         |                                                                                                                   |                                              |                         |                                                              |                     |                           |
| <b>TITLE</b><br>System and Method for Identifying Vehicle by Utilizing Detected Magnetic Field                                                                                                                                                                                                                                                                                                                                              |                                                                                                                   |                                              |                         |                                                              |                     |                           |
| <b>FILING FEE RECEIVED</b><br>2240                                                                                                                                                                                                                                                                                                                                                                                                          | FEES: Authority has been given in Paper<br>No. _____ to charge/credit DEPOSIT ACCOUNT<br>No. _____ for following: |                                              |                         | <input type="checkbox"/> All Fees                            |                     |                           |
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Sheet 1 of 3

**Complete if Known**

|                        |                     |
|------------------------|---------------------|
| Application Number     | 14/072,231          |
| Filing Date            | 11/05/2013          |
| First Named Inventor   | Sascha Simon        |
| Art Unit               | 2857                |
| Examiner Name          | Schechter, Andrew M |
| Attorney Docket Number | APIO-ID             |

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| Examiner Signature | /Edward Raymond/ | Date Considered | 03/20/2016 |
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|------------------------|---------------------|
| Application Number     | 14/072,231          |
| Filing Date            | 11/05/2013          |
| First Named Inventor   | Sascha Simon        |
| Art Unit               | 2857                |
| Examiner Name          | Schechter, Andrew M |
| Attorney Docket Number | APIO-ID             |

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| Examiner Signature | /Edward Raymond/ | Date Considered | 03/20/2016 |
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|                                                                                                                                              |                        | Art Unit                 | 2857                |
|                                                                                                                                              |                        | Examiner Name            | Schechter, Andrew M |
| Sheet 3 of 3                                                                                                                                 | Attorney Docket Number |                          | APIO-ID             |

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|--------------------|------------------|-----------------|------------|
| Examiner Signature | /Edward Raymond/ | Date Considered | 03/20/2016 |
|--------------------|------------------|-----------------|------------|

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

**EAST Search History****EAST Search History (Prior Art)**

| Ref # | Hits  | Search Query                                                                                                                                                                             | DBs                                                   | Default Operator | Plurals | Time Stamp       |
|-------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|------------------|---------|------------------|
| L1    | 25746 | magnetic adj field and vehicle and location                                                                                                                                              | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO | OR               | OFF     | 2016/03/21 07:32 |
| L2    | 36612 | magnetic adj field and vehicle and location                                                                                                                                              | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO | OR               | ON      | 2016/03/21 07:32 |
| L3    | 7437  | magnetic adj field and vehicle and location and database and signal and compar\$4                                                                                                        | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO | OR               | ON      | 2016/03/21 07:32 |
| L4    | 5525  | magnetic adj field and (vehicle or car) and (location or position) and database and signal and compar\$4 and electric                                                                    | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO | OR               | ON      | 2016/03/21 07:33 |
| L5    | 5404  | magnetic adj field and (vehicle or car) and (location or position) and database and signal and compar\$4 and electric and detect\$4                                                      | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO | OR               | ON      | 2016/03/21 07:34 |
| L6    | 1224  | magnetic adj field and (vehicle or car) and (location or position) and database and signal and compar\$4 and electric and detect\$4 and velocity and acceleration and gps                | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO | OR               | ON      | 2016/03/21 07:35 |
| L7    | 961   | magnetic adj field and (vehicle or car) and (location or position) and database and signal and compar\$4 and electric and detect\$4 and velocity and acceleration and gps and wirelessly | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO | OR               | ON      | 2016/03/21 07:35 |
| L8    | 1187  | magnetic adj field and (vehicle or car) and                                                                                                                                              | US-                                                   | OR               | ON      | 2016/03/21       |

|     |       |                                                                                                                                                                                                                        |                                                           |    |     |                     |
|-----|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|----|-----|---------------------|
|     |       | (location or position) and database and signal and compar\$4 and electric and detect\$4 and velocity and acceleration and gps and wireless\$3 and network                                                              | PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO        |    |     | 07:36               |
| L9  | 369   | magnetic adj field and (vehicle or car) and (location or position) and database and signal and compar\$4 and electric and detect\$4 and velocity and acceleration and gps and wireless\$3 and network and verification | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO | OR | ON  | 2016/03/21<br>07:40 |
| S1  | 236   | motion adj vector adj estimation                                                                                                                                                                                       | USPAT                                                     | OR | OFF | 2004/09/10<br>19:44 |
| S2  | 157   | motion adj vector adj estimation and predict\$                                                                                                                                                                         | USPAT                                                     | OR | OFF | 2004/05/05<br>16:00 |
| S3  | 141   | motion adj vector adj estimation and predict\$ and select\$                                                                                                                                                            | USPAT                                                     | OR | OFF | 2004/05/05<br>16:00 |
| S4  | 129   | motion adj vector adj estimation and predict\$ and select\$ and compar\$                                                                                                                                               | USPAT                                                     | OR | OFF | 2004/05/05<br>16:01 |
| S5  | 113   | motion adj vector adj estimation and predict\$ and select\$ and compar\$ and error                                                                                                                                     | USPAT                                                     | OR | OFF | 2004/05/05<br>16:01 |
| S6  | 99    | motion adj vector adj estimation and predict\$ and select\$ and compar\$ and error and field                                                                                                                           | USPAT                                                     | OR | OFF | 2004/05/05<br>16:02 |
| S7  | 37    | motion adj vector adj estimation and predict\$ and select\$ and compar\$ and error and field and threshold                                                                                                             | USPAT                                                     | OR | OFF | 2004/05/05<br>16:03 |
| S8  | 36    | motion adj vector adj estimation and predict\$ and select\$ and compar\$ and error and field and threshold and second                                                                                                  | USPAT                                                     | OR | OFF | 2004/05/05<br>16:29 |
| S9  | 32    | motion adj vector adj estimation and predict\$ and select\$ and compar\$ and error and field and threshold and second and search                                                                                       | USPAT                                                     | OR | OFF | 2004/05/05<br>16:29 |
| S10 | 8     | motion adj vector adj estimation and predict\$ and select\$ and compar\$ and error and field and threshold and second and full adj search                                                                              | USPAT                                                     | OR | OFF | 2004/05/05<br>16:49 |
| S11 | 276   | 702/179.ccls.                                                                                                                                                                                                          | USPAT                                                     | OR | OFF | 2004/05/06<br>12:02 |
| S12 | 298   | 702/185.ccls.                                                                                                                                                                                                          | USPAT                                                     | OR | OFF | 2004/09/10<br>19:46 |
| S13 | 5467  | motion adj sensing                                                                                                                                                                                                     | USPAT                                                     | OR | OFF | 2015/08/10<br>13:13 |
| S14 | 15258 | motion adj sensing                                                                                                                                                                                                     | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO | OR | ON  | 2015/08/10<br>13:13 |
| S15 | 6252  | motion adj sensing and visual                                                                                                                                                                                          | US-<br>PGPUB;<br>USPAT;<br>USOCR;                         | OR | ON  | 2015/08/10<br>13:14 |

EAST Search History

|     |      |                                                                      |                                                           |    |    |                     |
|-----|------|----------------------------------------------------------------------|-----------------------------------------------------------|----|----|---------------------|
|     |      |                                                                      | FPRS;<br>EPO;<br>JPO                                      |    |    |                     |
| S16 | 1730 | motion adj sensing and visual and<br>electromagnetic                 | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO | OR | ON | 2015/08/10<br>13:14 |
| S17 | 624  | motion adj sensing and visual and<br>electromagnetic and correlation | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO | OR | ON | 2015/08/10<br>13:21 |

3/ 21/ 2016 8:06:09 AM

C:\ Users\ eraymond\ Documents\ EAST\ Workspaces\ 14072231\_detect\_vehicle\_magnetic\_field.wsp

|                                                                                                             |                                            |                                                                 |
|-------------------------------------------------------------------------------------------------------------|--------------------------------------------|-----------------------------------------------------------------|
| <b>Index of Claims</b><br> | <b>Application/Control No.</b><br>14072231 | <b>Applicant(s)/Patent Under Reexamination</b><br>SIMON, SASCHA |
|                                                                                                             | <b>Examiner</b><br>EDWARD RAYMOND          | <b>Art Unit</b><br>2857                                         |

|   |          |   |            |   |              |   |          |
|---|----------|---|------------|---|--------------|---|----------|
| ✓ | Rejected | - | Cancelled  | N | Non-Elected  | A | Appeal   |
| = | Allowed  | ÷ | Restricted | I | Interference | O | Objected |

| <input checked="" type="checkbox"/> Claims renumbered in the same order as presented by applicant |          |            |  |  |  |  |  |  |  |  | <input type="checkbox"/> CPA | <input type="checkbox"/> T.D. | <input type="checkbox"/> R.1.47 |
|---------------------------------------------------------------------------------------------------|----------|------------|--|--|--|--|--|--|--|--|------------------------------|-------------------------------|---------------------------------|
| CLAIM                                                                                             |          | DATE       |  |  |  |  |  |  |  |  |                              |                               |                                 |
| Final                                                                                             | Original | 03/20/2016 |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 1        | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 2        | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 3        | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 4        | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 5        | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 6        | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 7        | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 8        | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 9        | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 10       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 11       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 12       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 13       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 14       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 15       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 16       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 17       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 18       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 19       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 20       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 21       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 22       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 23       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 24       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 25       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 26       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 27       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 28       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 29       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 30       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 31       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 32       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 33       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 34       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 35       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |
|                                                                                                   | 36       | =          |  |  |  |  |  |  |  |  |                              |                               |                                 |

|                                                                                                                    |                                            |                                                                 |
|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-----------------------------------------------------------------|
| <b><i>Index of Claims</i></b><br> | <b>Application/Control No.</b><br>14072231 | <b>Applicant(s)/Patent Under Reexamination</b><br>SIMON, SASCHA |
|                                                                                                                    | <b>Examiner</b><br>EDWARD RAYMOND          | <b>Art Unit</b><br>2857                                         |

|   |          |   |            |   |              |   |          |
|---|----------|---|------------|---|--------------|---|----------|
| ✓ | Rejected | - | Cancelled  | N | Non-Elected  | A | Appeal   |
| = | Allowed  | ÷ | Restricted | I | Interference | O | Objected |

|                                                                                                   |          |            |      |  |  |  |  |  |  |  |                              |  |                               |  |                                 |  |
|---------------------------------------------------------------------------------------------------|----------|------------|------|--|--|--|--|--|--|--|------------------------------|--|-------------------------------|--|---------------------------------|--|
| <input checked="" type="checkbox"/> Claims renumbered in the same order as presented by applicant |          |            |      |  |  |  |  |  |  |  | <input type="checkbox"/> CPA |  | <input type="checkbox"/> T.D. |  | <input type="checkbox"/> R.1.47 |  |
| CLAIM                                                                                             |          |            | DATE |  |  |  |  |  |  |  |                              |  |                               |  |                                 |  |
| Final                                                                                             | Original | 03/20/2016 |      |  |  |  |  |  |  |  |                              |  |                               |  |                                 |  |
|                                                                                                   | 37       | =          |      |  |  |  |  |  |  |  |                              |  |                               |  |                                 |  |
|                                                                                                   | 38       | =          |      |  |  |  |  |  |  |  |                              |  |                               |  |                                 |  |
|                                                                                                   | 39       | =          |      |  |  |  |  |  |  |  |                              |  |                               |  |                                 |  |
|                                                                                                   | 40       | =          |      |  |  |  |  |  |  |  |                              |  |                               |  |                                 |  |
|                                                                                                   | 41       | =          |      |  |  |  |  |  |  |  |                              |  |                               |  |                                 |  |



# PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, Virginia 22313-1450**  
**or Fax** (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

54671 7590 03/25/2016  
 The Law Office of John T. Whelan, LLC  
 2315 Hallowing Point Road  
 Prince Frederick, MD 20678

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

## Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

|                    |
|--------------------|
| (Depositor's name) |
| (Signature)        |
| (Date)             |

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 14/072,231      | 11/05/2013  | Sascha Simon         | APIO-ID             | 1942             |

TITLE OF INVENTION: System and Method for Identifying Vehicle by Utilizing Detected Magnetic Field

| APPL. TYPE     | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE   |
|----------------|---------------|---------------|---------------------|----------------------|------------------|------------|
| nonprovisional | SMALL         | \$480         | \$0                 | \$0                  | \$480            | 06/27/2016 |

| EXAMINER        | ART UNIT | CLASS-SUBCLASS |
|-----------------|----------|----------------|
| RAYMOND, EDWARD | 2857     | 702-065000     |

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB-122) attached.  
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB-47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively,  
 (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

JOHN T. WHELAN  
 2  
 3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

APIO SYSTEMS, INC.

(B) RESIDENCE: (CITY AND STATE OR COUNTRY)

ROCHELLE PARK, NEW JERSEY

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☒ Issue Fee  
☐ Publication Fee (No small entity discount permitted)  
☐ Advance Order - # of Copies \_\_\_\_\_

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.  
☐ Payment by credit card. Form PTO-2038 is attached.  
☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number \_\_\_\_\_ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29  
☐ Applicant asserting small entity status. See 37 CFR 1.27  
☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB-15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature John T. Whelan  
 Typed or printed name John T. Whelan

Date April 07, 2016  
 Registration No. 32,448

| Electronic Patent Application Fee Transmittal |          |                                                                                |        |                      |
|-----------------------------------------------|----------|--------------------------------------------------------------------------------|--------|----------------------|
| Application Number:                           |          | 14072231                                                                       |        |                      |
| Filing Date:                                  |          | 05-Nov-2013                                                                    |        |                      |
| Title of Invention:                           |          | System and Method for Identifying Vehicle by Utilizing Detected Magnetic Field |        |                      |
| First Named Inventor/Applicant Name:          |          | Sascha Simon                                                                   |        |                      |
| Filer:                                        |          | John T. Whelan                                                                 |        |                      |
| Attorney Docket Number:                       |          | APIO-ID                                                                        |        |                      |
| Filed as Small Entity                         |          |                                                                                |        |                      |
| Filing Fees for Utility under 35 USC 111(a)   |          |                                                                                |        |                      |
| Description                                   | Fee Code | Quantity                                                                       | Amount | Sub-Total in USD(\$) |
| Basic Filing:                                 |          |                                                                                |        |                      |
| Pages:                                        |          |                                                                                |        |                      |
| Claims:                                       |          |                                                                                |        |                      |
| Miscellaneous-Filing:                         |          |                                                                                |        |                      |
| Petition:                                     |          |                                                                                |        |                      |
| Patent-Appeals-and-Interference:              |          |                                                                                |        |                      |
| Post-Allowance-and-Post-Issuance:             |          |                                                                                |        |                      |
| Utility Appl Issue Fee                        | 2501     | 1                                                                              | 480    | 480                  |

| Description        | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|--------------------|----------|----------|--------|----------------------|
| Extension-of-Time: |          |          |        |                      |
| Miscellaneous:     |          |          |        |                      |
| Total in USD (\$)  |          |          |        | 480                  |

| Electronic Acknowledgement Receipt          |                                                                                |
|---------------------------------------------|--------------------------------------------------------------------------------|
| <b>EFS ID:</b>                              | 25424575                                                                       |
| <b>Application Number:</b>                  | 14072231                                                                       |
| <b>International Application Number:</b>    |                                                                                |
| <b>Confirmation Number:</b>                 | 1942                                                                           |
| <b>Title of Invention:</b>                  | System and Method for Identifying Vehicle by Utilizing Detected Magnetic Field |
| <b>First Named Inventor/Applicant Name:</b> | Sascha Simon                                                                   |
| <b>Customer Number:</b>                     | 54671                                                                          |
| <b>Filer:</b>                               | John T. Whelan                                                                 |
| <b>Filer Authorized By:</b>                 |                                                                                |
| <b>Attorney Docket Number:</b>              | APIO-ID                                                                        |
| <b>Receipt Date:</b>                        | 07-APR-2016                                                                    |
| <b>Filing Date:</b>                         | 05-NOV-2013                                                                    |
| <b>Time Stamp:</b>                          | 12:41:22                                                                       |
| <b>Application Type:</b>                    | Utility under 35 USC 111(a)                                                    |

**Payment information:**

|                                                                                                                |             |
|----------------------------------------------------------------------------------------------------------------|-------------|
| Submitted with Payment                                                                                         | yes         |
| Payment Type                                                                                                   | Credit Card |
| Payment was successfully received in RAM                                                                       | \$480       |
| RAM confirmation Number                                                                                        | 12073       |
| Deposit Account                                                                                                |             |
| Authorized User                                                                                                |             |
| The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: |             |

| <b>File Listing:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                             |                          |                                                    |                  |                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|--------------------------|----------------------------------------------------|------------------|------------------|
| Document Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Document Description        | File Name                | File Size(Bytes)/<br>Message Digest                | Multi Part /.zip | Pages (if appl.) |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Issue Fee Payment (PTO-85B) | ApioV2VIssueFeeTrans.pdf | 365656<br>b507b6b63536685dd842535d09707e3e0ff80f96 | no               | 1                |
| <b>Warnings:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                             |                          |                                                    |                  |                  |
| <b>Information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                             |                          |                                                    |                  |                  |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Fee Worksheet (SB06)        | fee-info.pdf             | 30437<br>1c7b778bc0a470e7de4cf89cfd1a0dc84109438c  | no               | 2                |
| <b>Warnings:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                             |                          |                                                    |                  |                  |
| <b>Information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                             |                          |                                                    |                  |                  |
| <b>Total Files Size (in bytes):</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                             |                          | 396093                                             |                  |                  |
| <p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b><br/> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b><br/> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b><br/> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> |                             |                          |                                                    |                  |                  |



## UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO. | ISSUE DATE | PATENT NO. | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|------------|------------|---------------------|------------------|
| 14/072,231      | 05/10/2016 | 9333946    | APIO-ID             | 1942             |

54671 7590 04/20/2016  
The Law Office of John T. Whelan, LLC  
2315 Hallowing Point Road  
Prince Frederick, MD 20678

### ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

#### **Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)** (application filed on or after May 29, 2000)

The Patent Term Adjustment is 445 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Sascha Simon, Warwick, NY;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit [SelectUSA.gov](http://SelectUSA.gov).

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|                                                                                                                                                            |                      |                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------------------------------------------------|
| <b>PATENT - POWER OF ATTORNEY<br/>OR<br/>REVOCATION OF POWER OF ATTORNEY<br/>WITH A NEW POWER OF ATTORNEY<br/>AND<br/>CHANGE OF CORRESPONDENCE ADDRESS</b> | Patent Number        | 9333946                                                                        |
|                                                                                                                                                            | Issue Date           | 2016-05-10                                                                     |
|                                                                                                                                                            | First Named Inventor | Sascha Simon                                                                   |
|                                                                                                                                                            | Title                | System and Method for Identifying Vehicle by Utilizing Detected Magnetic Field |
|                                                                                                                                                            | Attorney Docket No.  | SFARAI-105002US1                                                               |

I hereby revoke all previous powers of attorney given in the above-identified patent.

☐ A Power of Attorney is submitted herewith.

OR  
☒ I hereby appoint Practitioner(s) associated with the Customer Number identified in the box at right as my/our attorney(s) or agent(s) with respect to the patent identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

114903

OR  
☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) with respect to the patent identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

| Practitioner(s) Name | Registration Number |
|----------------------|---------------------|
|                      |                     |
|                      |                     |
|                      |                     |
|                      |                     |

Please recognize or change the correspondence address for the above-identified patent to:

☒ The address associated with the above-identified Customer Number.

OR  
☐ The address associated with the Customer Number identified in the box at right:

☐ Firm or☐ Individual Name

Address

City

State

Zip

Country

Telephone

Email

I am the:

☐ Applicant.

OR

☒ Patent owner.

Statement under 37 CFR 3.73(c) (Form PTO/AIA/96) submitted herewith or filed on \_\_\_\_\_

SIGNATURE of Applicant or Patent Owner

Signature

Date

2020-06-25

Name

Telephone

Title and Company

President, Sfera Inc.

NOTE: Signatures of all the applicants or patent owners of the entire interest or their representative(s) are required. If more than one signature is required, submit multiple forms, check the box below, and identify the total number of forms submitted in the blank below.

☐ A total of \_\_\_\_\_ forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public, which is to update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

| Electronic Acknowledgement Receipt   |                                                                                |
|--------------------------------------|--------------------------------------------------------------------------------|
| EFS ID:                              | 39832646                                                                       |
| Application Number:                  | 14072231                                                                       |
| International Application Number:    |                                                                                |
| Confirmation Number:                 | 1942                                                                           |
| Title of Invention:                  | System and Method for Identifying Vehicle by Utilizing Detected Magnetic Field |
| First Named Inventor/Applicant Name: | Sascha Simon                                                                   |
| Customer Number:                     | 54671                                                                          |
| Filer:                               | Kyle Montgomery Zeller                                                         |
| Filer Authorized By:                 |                                                                                |
| Attorney Docket Number:              | APIO-ID                                                                        |
| Receipt Date:                        | 26-JUN-2020                                                                    |
| Filing Date:                         | 05-NOV-2013                                                                    |
| Time Stamp:                          | 13:30:28                                                                       |
| Application Type:                    | Utility under 35 USC 111(a)                                                    |

**Payment information:**

|                        |    |
|------------------------|----|
| Submitted with Payment | no |
|------------------------|----|

**File Listing:**

| Document Number | Document Description                          | File Name             | File Size(Bytes)/<br>Message Digest    | Multi Part /.zip | Pages (if appl.) |
|-----------------|-----------------------------------------------|-----------------------|----------------------------------------|------------------|------------------|
| 1               | Assignee showing of ownership per 37 CFR 3.73 | aia0096_105002US1.pdf | 287251                                 | no               | 5                |
|                 |                                               |                       | 48686e4d375453d495dbec3656f69cbdd1cc27 |                  |                  |

**Warnings:**



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |              |                                         |    |   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------|-----------------------------------------|----|---|
| <b>Information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |              |                                         |    |   |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Power of Attorney | aia0081a.pdf | 848372                                  | no | 1 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |              | 0b185ac333b30dcfcebd11b4d23155ad7ebd098 |    |   |
| <b>Warnings:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |              |                                         |    |   |
| <b>Information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |              |                                         |    |   |
| <b>Total Files Size (in bytes):</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |              | 1135623                                 |    |   |
| <p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b><br/> <b>If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</b></p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b><br/> <b>If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</b></p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b><br/> <b>If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</b></p> |                   |              |                                         |    |   |

**STATEMENT UNDER 37 CFR 3.73(c)**

Applicant/Patent Owner: Sfara Inc.

Application No./Patent No.: 9333946 Filed/Issue Date: 2016-05-10

Titled: System and Method for Identifying Vehicle by Utilizing Detected Magnetic Field

Sfara Inc., a corporation

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☒ The assignee of the entire right, title, and interest.
2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):
- ☐ The extent (by percentage) of its ownership interest is \_\_\_\_%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.
- ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (e.g., bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

- A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

- B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Sascha Simon To: Apio Systems Inc.

The document was recorded in the United States Patent and Trademark Office at  
Reel 038125, Frame 0162, or for which a copy thereof is attached.

2. From: Apio Systems Inc. To: Driversiti Inc.

The document was recorded in the United States Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

[Page 1 of 2]

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

**STATEMENT UNDER 37 CFR 3.73(c)**

3. From: Driversiti Inc. To: Sfara Inc.

The document was recorded in the United States Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

4. From: \_\_\_\_\_ To: \_\_\_\_\_

The document was recorded in the United States Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

5. From: \_\_\_\_\_ To: \_\_\_\_\_

The document was recorded in the United States Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

6. From: \_\_\_\_\_ To: \_\_\_\_\_

The document was recorded in the United States Patent and Trademark Office at  
Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☒ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Kyle Zeller/

2020-06-25

Signature

Date

Kyle Zeller

64748

Printed or Typed Name

Title or Registration Number

# Delaware

The First State

Page 1

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE RESTATED CERTIFICATE OF "APIO SYSTEMS INC.", CHANGING ITS NAME FROM "APIO SYSTEMS INC." TO "DRIVERSITI INC.", FILED IN THIS OFFICE ON THE EIGHTEENTH DAY OF OCTOBER, A.D. 2016, AT 2:37 O`CLOCK P.M.

A FILED COPY OF THIS CERTIFICATE HAS BEEN FORWARDED TO THE NEW CASTLE COUNTY RECORDER OF DEEDS.



5186994 8100  
SR# 20166251451

You may verify this certificate online at [corp.delaware.gov/authver.shtml](http://corp.delaware.gov/authver.shtml)

A handwritten signature in black ink, appearing to read "JBULLOCK", is written over a horizontal line. Below the line, the text "Jeffrey W. Bullock, Secretary of State" is printed in a small font.

Authentication: 203179535  
Date: 10-18-16

# Delaware

The First State

Page 1

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF AMENDMENT OF "DRIVERSITI INC.", CHANGING ITS NAME FROM "DRIVERSITI INC." TO "SFARA INC.", FILED IN THIS OFFICE ON THE SIXTH DAY OF NOVEMBER, A.D. 2017, AT 10:58 O`CLOCK A.M.

A FILED COPY OF THIS CERTIFICATE HAS BEEN FORWARDED TO THE NEW CASTLE COUNTY RECORDER OF DEEDS.



5186994 8100  
SR# 20176942770

You may verify this certificate online at [corp.delaware.gov/authver.shtml](http://corp.delaware.gov/authver.shtml)

A handwritten signature in black ink, appearing to read "JB", is written over a horizontal line. Below the line, the text "Jeffrey W. Bullock, Secretary of State" is printed.

Authentication: 203528317  
Date: 11-07-17

## Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NUMBER | FILING OR 371(C) DATE | FIRST NAMED APPLICANT | ATTY. DOCKET NO./TITLE |
|--------------------|-----------------------|-----------------------|------------------------|
| 14/072,231         | 11/05/2013            | Sascha Simon          | APIO-ID                |

**CONFIRMATION NO. 1942**

**POA ACCEPTANCE LETTER**

114903  
Zeller IP Group PLLC  
155 Water St.  
Suite 6-6  
Brooklyn, NY 11201



Date Mailed: 07/01/2020

**NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY**

This is in response to the Power of Attorney filed 06/26/2020.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/ggasgedom/

# TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

Note: This form is to be submitted with a Power of Attorney to identify the application to which the Power of Attorney is directed.

|                        |                                                                                |
|------------------------|--------------------------------------------------------------------------------|
| Application Number     | 14/072,231                                                                     |
| Filing Date            | November 5, 2013                                                               |
| First Named Inventor   | Sascha Simon                                                                   |
| Title                  | SYSTEM AND METHOD FOR IDENTIFYING VEHICLE BY UTILIZING DETECTED MAGNETIC FIELD |
| Art Unit               | <u>2857</u>                                                                    |
| Examiner Name          |                                                                                |
| Attorney Docket Number | S18.12-0009                                                                    |

## SIGNATURE of Patent Practitioner

|                     |                                                                                    |           |              |
|---------------------|------------------------------------------------------------------------------------|-----------|--------------|
| Signature           |  | Date      |              |
| Name                | CHRISTOPHER J. VOLKMANN                                                            | Telephone | 952-467-6088 |
| Registration Number | 60,349                                                                             |           |              |



Under the Paperwork Reduction Act of 1995, no person is required to respond to a collection of information unless it displays a valid OMB control number.

**POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO**

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:



Practitioners associated with Customer Number: 117849

OR



Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

| Name | Registration Number |
|------|---------------------|
|      |                     |
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| Name | Registration Number |
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As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:



The address associated with Customer Number: 117849

OR



Firm or individual name

Address

City

State

Zip

Country

Telephone

Email

Assignee name and address:

Sfara, Inc.

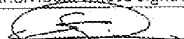
221 River Street, 9th floor, Hoboken, NJ 07030

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

## SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee.

Signature



Date 04/26/2022

Name

Sascha Simon

Telephone 201 663 6063 x700

Title

President, Founder &amp; CSO

This collection of information is required by 37 CFR 1.31, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public, which is to update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 18 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEE OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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| "FEE ADDRESS" INDICATION FORM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| <b>Address to:</b><br>Mail Stop Maintenance Fee<br>Director of the United States<br>Patent and Trademark Office<br>P.O. Box 1450<br>Alexandria, VA 22313-1450                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                              |
| <b>Fax to:</b><br>571-273-6500                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                              |
| <b>INSTRUCTIONS:</b> The issue fee must have been paid for the application(s) listed on this form. In addition, only an address represented by a Customer Number can be established as the fee address for maintenance fee purposes (hereafter, fee address). A fee address should be established when correspondence related to maintenance fees should be mailed to a different address than the correspondence address for the application.<br><b>When to check the first box below:</b> If you have a Customer Number to represent the fee address.<br><b>When to check the second box below:</b> If you have no Customer Number representing the desired fee address, in which case a completed Request for Customer Number (PTO/SB/125) must be attached to this form. For more information on Customer Numbers, see the Manual of Patent Examining Procedure (MPEP) § 403. |                              |
| For the following listed application(s), please recognize as the "Fee Address" under the provisions of 37 CFR 1.363 the address associated with:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                              |
| <input checked="" type="checkbox"/> Customer Number: 117849                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                              |
| OR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                              |
| <input type="checkbox"/> The attached Request for Customer Number form (PTO/SB/125)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                              |
| PATENT NUMBER<br>(if known)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | APPLICATION NUMBER           |
| 9,333,946                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 14/072,231                   |
| Completed by (check one):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                              |
| <input type="checkbox"/> Applicant/inventor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Signature                    |
| <input checked="" type="checkbox"/> Attorney or Agent of record 60,349<br>Reg. No.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Christopher J. Volkmann      |
| <input type="checkbox"/> Assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(c) (Form PTO/AIA/96) is enclosed or was filed on                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Typed or printed name        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 952-467-6088                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Requester's telephone number |
| (Date)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 07/18/2022                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Date                         |
| NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. If the assignee is a juristic entity, this form must be signed by a patent practitioner (attorney or agent) of record. Submit multiple forms if more than one signature is required, see below*.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                              |
| <input checked="" type="checkbox"/> *Total of 1 forms are submitted                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                              |

A Federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with an information collection subject to the requirements of the Paperwork Reduction Act of 1995, unless the information collection has a currently valid OMB Control Number. The OMB Control Number for this information collection is 0651-0016. Public burden for this form is estimated to average 5 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden to the Chief Administrative Officer, United States Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450 or email [informationCollection@uspto.gov](mailto:informationCollection@uspto.gov). DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9198 and select option 2.

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**CHANGE OF  
CORRESPONDENCE ADDRESS  
Application**Address to:  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

|                        |                  |
|------------------------|------------------|
| Application Number     | 14/072,231       |
| Filing Date            | November 5, 2013 |
| First Named Inventor   | Sascha, Simon    |
| Art Unit               | 2857             |
| Examiner Name          |                  |
| Attorney Docket Number | S18.12-0009      |

Please change the Correspondence Address for the above-identified patent application to:

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117849

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This form cannot be used to change the data associated with a Customer Number. To change the data associated with an existing Customer Number use "Request for Customer Number Data Change" (PTO/SB/124).

I am the:



Applicant

Attorney or agent of record. Registration Number 60,349

Registered practitioner named in the application transmittal papers who acts in a representative capacity under 37 CFR 1.34. See 37 CFR 1.33(a)(1). Registration Number \_\_\_\_\_

Signature

Typed or Printed  
Name

Christopher J. Volkmann

Date 07/18/2022

Telephone 952-467-6088

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below.



\*Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

| Electronic Acknowledgement Receipt   |                                                                                |
|--------------------------------------|--------------------------------------------------------------------------------|
| EFS ID:                              | 46212868                                                                       |
| Application Number:                  | 14072231                                                                       |
| International Application Number:    |                                                                                |
| Confirmation Number:                 | 1942                                                                           |
| Title of Invention:                  | System and Method for Identifying Vehicle by Utilizing Detected Magnetic Field |
| First Named Inventor/Applicant Name: | Sascha Simon                                                                   |
| Customer Number:                     | 114903                                                                         |
| Filer:                               | Christopher James Volkmann/Dawn Rud                                            |
| Filer Authorized By:                 | Christopher James Volkmann                                                     |
| Attorney Docket Number:              | SFARAI-105002US1                                                               |
| Receipt Date:                        | 18-JUL-2022                                                                    |
| Filing Date:                         | 05-NOV-2013                                                                    |
| Time Stamp:                          | 17:10:32                                                                       |
| Application Type:                    | Utility under 35 USC 111(a)                                                    |

Payment information:

|                        |    |
|------------------------|----|
| Submitted with Payment | no |
|------------------------|----|

File Listing:

| Document Number | Document Description | File Name                      | File Size(Bytes)/ Message Digest         | Multi Part /.zip | Pages (if appl.) |
|-----------------|----------------------|--------------------------------|------------------------------------------|------------------|------------------|
| 1               | Power of Attorney    | S18-12-0009_POA_2022-07-18.pdf | 558601                                   | no               | 2                |
|                 |                      |                                | 3cbf8446d1897901d1c35ccfa6335370ab250f11 |                  |                  |

Warnings:

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                |                                            |                                                        |    |   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------------------------------------------|--------------------------------------------------------|----|---|
| <b>Information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                |                                            |                                                        |    |   |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Maintenance Fee Address Change | S18-12-0009_feeaddress_2022-07-18.pdf      | 384603<br>9d0549e3a318d4098d9494b387cfaace6b<br>bf27a  | no | 1 |
| <b>Warnings:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                |                                            |                                                        |    |   |
| <b>Information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                |                                            |                                                        |    |   |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Change of Address              | S18-12-0009_changeofaddress_2022-07-18.pdf | 367723<br>b18f837f0be0189cfa7965f91caa3c43b996<br>b1be | no | 1 |
| <b>Warnings:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                |                                            |                                                        |    |   |
| <b>Information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                |                                            |                                                        |    |   |
| <b>Total Files Size (in bytes):</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                |                                            | 1310927                                                |    |   |
| <p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b><br/> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b><br/> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b><br/> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> |                                |                                            |                                                        |    |   |



UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NUMBER | FILING OR 371(C) DATE | FIRST NAMED APPLICANT | ATTY. DOCKET NO./TITLE |
|--------------------|-----------------------|-----------------------|------------------------|
| 14/072,231         | 11/05/2013            | Sascha Simon          | \$18.12-0009           |

**CONFIRMATION NO. 1942**

**POA ACCEPTANCE LETTER**

117849  
Kelly, Holt & Christenson, P.L.L.C.  
141 West 1st Street, Suite 100  
Waconia, MN 55387



Date Mailed: 07/25/2022

**NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY**

This is in response to the Power of Attorney filed 07/18/2022.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/tmwilliams/



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www.uspto.gov

| APPLICATION NUMBER | FILING OR 371(C) DATE | FIRST NAMED APPLICANT | ATTY. DOCKET NO./TITLE |
|--------------------|-----------------------|-----------------------|------------------------|
| 14/072,231         | 11/05/2013            | Sascha Simon          | SFARAI-105002US1       |

**CONFIRMATION NO. 1942**

**POWER OF ATTORNEY NOTICE**



\*OC000000135371839\*

114903  
Zeller IP Group PLLC  
Kyle Zeller  
247 W 87th ST  
10K  
New York, NY 10024

Date Mailed: 07/25/2022

**NOTICE REGARDING CHANGE OF POWER OF ATTORNEY**

This is in response to the Power of Attorney filed 07/18/2022.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/tmwilliams/