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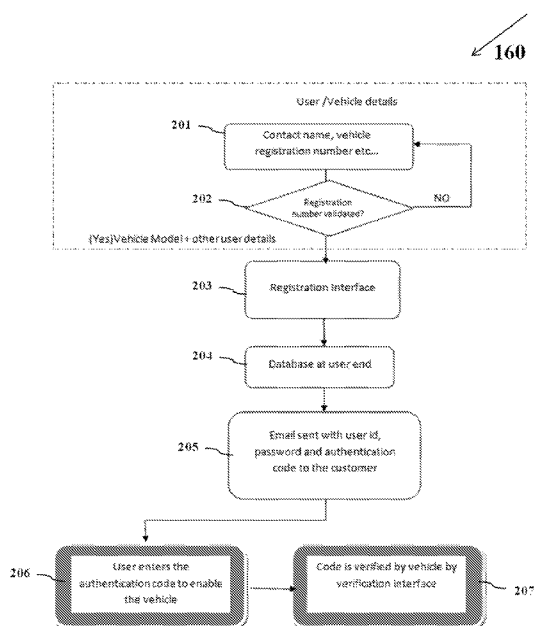


Fig. 3

(57) Abstract: The present invention provides a diagnostic system (150) capable of enabling the user of the vehicle to continuously monitor the health status of the vehicle and determine whenever any particular part of the vehicle malfunctions. The diagnostic system (150) includes a registration module (100) for registering of the user related details, a service booking module (200) to schedule a service as per user desired date and time, a sound recording module (300) to diagnose faulty vehicular parts, a vehicle maintenance module (400) to diagnose and to resolve the problem in the vehicle, a settings module (500) to perform various account settings, and a feedback module (600) facilitating communication between the vehicular service network and the user regarding the service provided by the vehicular service network. The diagnostic system enables real time addressing of the problems occurring in the vehicle as desired by the user.

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A DIAGNOSTIC SYSTEM FOR A VEHICLE AND A METHOD THEREOF

TECHNICAL FIELD

[0001] The present invention generally relates to a diagnostic system, and in particular, to a vehicle diagnostic system and a method thereof.

BACKGROUND

[0002] Generally, users of vehicles, for example, two-or-three-wheeled vehicles, are aware of service requirements of the vehicle. For instance, any vehicle requires undergoing regular and periodic maintenance checks, and more particularly, during first few years of the vehicle. Most often, the user or the vehicular service network is required to maintain a separate track record of the maintenance checks the vehicle undergoes. In the absence of such track record, the maintenance process of the vehicle becomes cumbersome and may often lead to sudden halts or break downs without prior knowledge of the user of the vehicle. It is truer because most users are not aware of the condition of various parts in their vehicle unless they are checked at the vehicular service network.

[0003] Further, there may be situations where some parts of the vehicle may malfunction at an unexpected instance. During such malfunctioning of the vehicular parts, the user may not be aware of the immediate remedy, and is most often left to take the vehicle to the nearby vehicular service network. In some cases, such sudden malfunctions may also affect the safety of the user.

[0004] Hence, there has been a continuous effort to overcome such scenarios and ensure complete safety of the user of the vehicle. However, many such efforts that have been carried out in the recent past have only added to more and more manual intervention and several complex mechanisms involving various devices to figure out such malfunctioning of the vehicular parts. Therefore, there is a need for an efficient and effective diagnostic system which can enable automated diagnosis of the vehicle to be able to enhance the utility of the vehicle with optimal down time.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] The detailed description is described with reference to the accompanying figures. The same numbers are used throughout the drawings to reference like features and components.

[0006] **Fig. 1** illustrates a block diagram of a vehicle diagnostic system for a vehicle.

[0007] **Fig. 2** illustrates a block diagram of a registration module of the diagnostic system.

[0008] **Fig. 3** illustrates a flow diagram depicting functionality of the registration module of the diagnostic system.

[0009] **Fig. 4** illustrates a block diagram of a service booking module of the diagnostic system.

[0010] **Fig. 5** illustrates a flow diagram depicting functionality of the service booking module of the diagnostic system.

[0011] **Fig. 6** illustrates a flow diagram depicting the functionality of the sound recording module of the diagnostic system.

[0012] **Fig. 7** illustrates a flow diagram depicting the functionality of the vehicle maintenance module of the diagnostic system.

[0013] **Fig. 8** illustrates a block diagram of a settings module of the diagnostic system.

[0014] **Fig. 9** illustrates a flow diagram depicting a functionality of a feedback module of the diagnostic system.

DETAILED DESCRIPTION

[0015] The present invention provides a diagnostic system that is simple, convenient, reducing manual intervention, and accurate. For example, the diagnostic system of the present invention is capable of enabling the user of the vehicle to continuously monitor the health status of the vehicle and determine whenever any particular part of the vehicle malfunctions. The present invention also enables the diagnostic system to communicate the determined diagnostic status of the vehicle with the user and suggest the user for an appropriate remedial action. In an embodiment, the present system is capable of addressing the vehicular malfunctions by comparing the current malfunction with the previously recorded fixes for a similar malfunction that has occurred in the past. The present system is also capable of communicating successful fixing of such malfunctions to the user through a display device including any of a mobile

device, an instrument cluster, or any other electronic devices such as smart watches. In an embodiment, the present invention enables the diagnostic system to record and keep a track of the vehicle service history and extrapolate possible issues that may occur with respect to a particular part in future, which helps the user to keep a check on such list of possible issues that may occur in a particular period.

[00016] In an embodiment, the present invention also enables the diagnostic system to periodically communicate the health status of the vehicle with the vehicular service network to ensure that no major failures would occur and to ensure that any particular maintenance issues for which manual intervention is required is communicated to the engineers at the vehicular service network. In an embodiment, the diagnostic system of the present invention enables automatic booking of service upon detecting of such faults with the nearby or authorized vehicular service networks.

[00017] In an embodiment, the diagnostic system of the present invention includes a sound recording module that enables recording of sound of various vehicular parts, particularly, engine. In an embodiment, the diagnostic system enables periodic recording of sounds to continuously monitor the health state of vehicular parts such as the engine. For example, upon recording the sound of the engine by the sound recording module, the system enables comparing of the recorded sound with a plurality of reference sounds that are accessed from a sound database. The system is further capable of detecting any deviation in the recorded sound with respect to the reference sound. Upon detection of any deviation, the present system is capable of communicating the present health state of the engine with the user and/or the vehicular service network. Depending upon the complexity of the detected deviation, the present system is capable of suggesting one or more remedial actions to the user. For example, the remedial action can be provided in the form of a series of easy actions that can be performed by the user, which would enable the user to fix the present issue. In an alternative embodiment, the system can provide a warning signal or an alarming indication to the user and the vehicular service network, which draws the attention of the vehicular service network for an immediate action.

[00018] In another embodiment, the diagnostic system is also capable of recording sounds of various other parts of the vehicle, for example, movable parts of the vehicle other than the engine, suspension system, braking system, and other body parts, which are usually made of resin, and which are bound to create noise over substantial usage of the vehicle. The system is

capable of comparing such recorded sounds with the predefined sounds of vehicular parts that are stored in the sound database to determine the deviation of the presently recorded sound. In case of any deviation, the system communicates the deviation to the user and/or the vehicular service network, apart from providing the remedial action to fix such deviations.

[00019] In an embodiment, the diagnostic system of the present invention is capable of receiving one or more fault codes from the ECU of the vehicle, whenever there is malfunction of a particular vehicular component. The one or more fault codes can be sent in the form of binary codes to the fault detection module of the diagnostic system, which in turn interprets such fault codes and convert them into user inputs and communicate to the user and/or the vehicular service network.

[00020] In one embodiment, the diagnostic system is integrated to the vehicle speedometer or the instrument cluster and controlled by the ECU of the vehicle. In an embodiment, the diagnostic system communicates with the user through the user interface of the vehicle speedometer. In an alternative embodiment, the diagnostic system can be part of an external electronic device, for example, a mobile phone of the user, which allows the user to install the diagnostic system and establish a wired/wireless communication with the vehicle. In an embodiment, the installation of the diagnostic system on the user's mobile phone involves downloading of an application and authenticating the device with a central server and creating an authenticated channel of communication with the vehicle.

[00021] Further, in an embodiment, the diagnostic module in the mobile phone acts as an interface that allows the user to communicate with the vehicle and the vehicular service network. Furthermore, the diagnostic center enables the user and the vehicle to send feedback to the central server. For example, the central server can be located at the vehicle manufacturer's end, which allows the vehicle manufacturer to record the history of diagnosis from several users and create periodic fixes that can ensure the continuous well-being of the vehicle. For instance, the feedback module enables the manufacturer to fix a potential problem in a particular vehicle based on the feedback received from another vehicle of the same batch of vehicles.

[00022] These and other advantages of the present subject matter would be described in greater detail in conjunction with the figures in the following description.

[00023] **Fig. 1** illustrates a block diagram of a vehicle diagnostic system. The diagnostic system **150** for a vehicle includes one or more modules **100, 200, 300, 400, 500, and 600** to perform

various function, the one or more modules **100**, **200**, **300**, **400**, **500**, and **600** include a registration module **100** for registering of the user related details, a service booking module **200** to schedule a service as per user desired date and time, a sound recording module **300** to diagnose faulty vehicular parts, a vehicle maintenance module **400** to diagnose and to resolve the problem in the vehicle, a settings module **500** to perform various account settings, and a feedback module **600** facilitating communication between the vehicular service network and the user regarding the service provided by the vehicular service network.

[00024] Fig.2 illustrates a block diagram of a registration module of the diagnostic system. The registration module **100** includes a data repository **101** located at a server database, an interface which performs intermediary functions like authentication of inputs fed by the user. For example, the inputs fed by the user include vehicle number, vehicle type, vehicle class, frame number and so on. The authentication of the inputs fed by the user is authenticated by various authentication blocks including authentication of vehicle number as indicated by block **102**, authentication of vehicle type and vehicle class as indicated by block **103**, authentication of vehicle frame number **104**. The registration module further includes various functions that are performed at the user end **105**. The various functions that are essential to the user and are performed by the registration module includes registration of user's name, registration of vehicle identification number, vehicle type and vehicle class, registration of unique frame number of the vehicle, registration of user's email ID, registration of user's phone number, registration of client's location/place of residence, registration of any other user details and registration of other interests of the user. All the details fed as inputs by the user at the user end are authenticated by the interface before registration. Therefore, a safe and secure method of registration of the user details is achieved according to the proposed invention.

[00025] Fig. 3 illustrates a flow diagram depicting functionality of the registration module of the diagnostic system. The registration module includes user database containing details of the user and the vehicle, for example, the details include contact name of the user, vehicle registration number etc. The input data is fed by the user as indicated in step **201**. In step **202**, the registration number of the vehicle as fed by the user is validated. After validation of the registration number, at step **203**, the registration number is sent through the interface to the database at the user end **204**. Finally, from the user database, a user ID, password and authentication code is sent to the user as shown in step **205**. The user ID and the password are used by the user as login credentials

before registration of the details of concerned vehicle. As indicated in step **206**, the user enters the authentication code received to enable authenticated channel of communication with the vehicle and finally, at step **207** the authentication code given by the user is verified by the verification interface of the vehicle. Therefore, in this way, the details of the vehicle and the concerned user are linked through the diagnostic system **150**.

[00026] **Fig. 4** illustrates a block diagram of a service booking module of the diagnostic system. The service booking module **200** performs the functionality of booking a service appointment with the vehicular service network. The block **305** includes all the inputs fed by the user. The user inputs are the details required by the interface from the user in order to fulfill the functionality of performing the action of booking the service with the vehicular service network. The various inputs fed by the user includes place, required dealer of the city, service type, required date, required time, and any other remarks. All the inputs fed by the user are stored in a data repository **301** at the server database. The intermediary functions of booking the service by communicating with the user through a display device including any of a mobile device, an instrument cluster, or any other electronic devices such as smart watches and the vehicular service network is performed by the interface. The intermediary functions include fetching all the cities **302** to be communicated to the user, fetch the list of dealers for the selected city **303**, and fetch the service types **304**. Depending upon the required inputs given by the user, the interface aids in booking desired service appointed with the vehicular service network for the user. Hence, a simpler and easier mechanism of service booking is achieved as proposed by the present invention.

[00027] **Fig. 5** illustrates a flow diagram depicting functionality of the service booking module of the diagnostic system **150**. After the required service input is selected by the user **401**, the module proceeds with the service booking for the user. Before proceeding with the service booking, a check is done if automatic service booking is scheduled as shown in step **402**, if automatic service booking is scheduled, then the detected fault condition in the vehicle **403** is sent to the vehicular service network along with the user details as stored in the data repository as shown in step **404**, finally, after receiving a communication by the vehicular service network regarding booking of a service appointment along with the user details, the vehicular service network contacts the user through a display device including any of a mobile device, an

instrument cluster, or any other electronic devices such as smart watches for communicating the confirmation or non-availability of service appointment as indicated in step **405**.

[00028] If automatic service scheduling is not selected by the user, then the details regarding identity of the user, the place of the user, the registration number and the service type is fetched from the data repository as indicated in step **406**. Further in step **407**, the non-availability of the vehicular service network is communicated to the user, the checking of availability of the vehicular service network is carried out in step **408**, if the vehicular service network is available then, depending upon the required inputs as indicated in step **409**, given by the user, the interface communicates **410** the confirmation of the booking details to the user as indicated in step **411**.

[00029] **Fig. 6** illustrates a flow diagram depicting the functionality of the sound recording module of the diagnostic system. The sound recording module **300** includes an instrument **501**, for example, a microphone for performing the functionality of recording any sound of the vehicular parts and in particular to the engine sound as indicated in step **502**, the recorded sound is further sent to any of an user end through an indicating device including any of a mobile device, an instrument cluster, or any other electronic devices such as smart watches and a vehicular diagnostic module as indicated in step **503**, a comparison functionality as indicated in step **505** is performed by taking a reference sound stored in reference database module as indicated in step **504**, after analyzing the sound and after comparison, any problem in the vehicle is detected as indicated in step **506**, if problem is detected and if service is required as indicated in step **507**, a service is booked with the vehicular service network and if no problem is detected then a service is not scheduled as indicated in step **508**.

[00030] **Fig. 7** illustrates a flow diagram depicting the functionality of the vehicle maintenance module of the diagnostic system. The vehicle maintenance module **400** begins its functionality as indicated in step **601** if there exists a problem in the vehicle as indicated in step **602**. If there is a problem, then various vehicular parameters are communicated to at least one of the user and a vehicular diagnostic module as indicated in step **603**, the user selects the required parameter and is confirmed by the user as indicated in step **604** and diagnosis related modules are communicated to the user as indicated in step **605**, if required parameter is not selected by the user, then the parameters are communicated to the user until a confirmation regarding selection of parameter is receiving from the user. After step **605**, if a related module for diagnosis is found

as indicated in step **606**, then the communicated steps are followed to resolve the issue as indicated in step **607**, else the user keeps checking of diagnostic related modules. Once, the problem in the vehicle is resolved as indicated in step **608**, and then the functionality of the module stops. If the problem is not resolved, then the vehicular service network is contacted by the interface to schedule an appointment for the user.

[00031] Further, according to another embodiment of the present invention, the vehicle maintenance module **400** begins its functionality as indicated in step **601** if there exists a problem in the vehicle as indicated in step **602**. If there is a problem, then various vehicular parameters are communicated to at least one of the user and a vehicular diagnostic module as indicated in step **603**, the user selects the required parameter and is confirmed by the user as indicated in step **604** and diagnosis related modules are communicated to the user as indicated in step **605** and however, if the user desires to discontinue from the vehicle maintenance module, the same can be carried out.

[00032] **Fig. 8** illustrates a block diagram of a settings module of the diagnostic system. The settings module **500** includes various settings that can be performed by the user to customize the interface. Various settings include, for example, account settings comprising change of username, change of password and the like as indicated by **701**. The settings module includes rain alarm settings comprising setting alarm time, switching ON/OFF of rain alarm as indicated by **702**. Further includes SOS settings comprising addition of emergency numbers, addition of gestures to perform a particular functionality, etc. as indicated by **703**. The settings module further includes SMS settings comprising enabling of addition of important contacts and enabling editing of received messages as indicated in step **704**.

[00033] **Fig. 9** illustrates a flow diagram depicting a functionality of a feedback module of the diagnostic system. The feedback module **600** comprises a step **802** involving filling in the details in the feedback form by the user **801**; the filled feedback form is communicated through the interface **803** to the vehicular service network or any recipient as indicated in step **805**. If the communication is not sent by the interface, then the feedback form is again sent to the user as indicated in step **806** and the process continues.

[00034] **Fig. 3, Fig. 5, Fig. 6, Fig. 7, and Fig. 9** illustrates various embodiments of a vehicle diagnostic method. The vehicle diagnostic method **160, 170, 300, 400, 500, 600** performs

receiving **105, 305** at least one of one or more user inputs inputted by the user including inputs includes place, required dealer of the city, service type, required date, required time, and the like and one or more critical vehicular inputs including comprising vehicle number, vehicle type, vehicle class, frame number and the like. The vehicle diagnostic method **160, 170, 300, 400, 500, 600** further performs detecting of one or more abnormalities **506, 602** based on the at least one of one or more user inputs and one or more critical vehicular inputs, after detecting the one or more abnormalities **506, 602**, a vehicular diagnostic module identifies **605** one or more self diagnostic measures that enables fixing of the detected one or more abnormalities **506, 602**, further, the identified self diagnostic measures is communicated to the vehicular diagnostic module or to the user through a display device including any of a mobile device, an instrument cluster, or any other electronic devices such as smart watches, if the detected one or more abnormalities **506, 602** is fixed. Furthermore, if the detected one or more abnormalities **506, 602** are not fixed, then a vehicular service network is communicated about the same.

[00035] Although the subject matter has been described in considerable detail with reference to certain embodiments thereof, other embodiments are possible. It is to be understood that the aspects of the embodiments are not necessarily limited to the features described herein.

We claim:

1. A vehicle diagnostic method (**160, 170, 300, 400, 500, 600**) comprising the steps of:
 - receiving (**105, 305**) at least one of one or more user inputs and one or more critical vehicular inputs;
 - detecting one or more abnormalities (**506, 602**) based on the at least one of one or more user inputs and one or more critical vehicular inputs;
 - identifying (**605**) one or more self diagnostic measures enabling fixing of said detected one or more abnormalities (**506, 602**);
 - communicating said identified self diagnostic measures to at least one of user end and vehicular diagnostic module, if said detected one or more abnormalities (**506, 602**) is fixed; and
 - communicating (**507, 609**) to at least one of vehicular service network about said abnormality, if said detected one or more abnormalities (**506, 602**) is not fixed.
2. The vehicle diagnostic method (**160, 170, 300, 400, 500, 600**) as claimed in claim 1, wherein said detecting one or more abnormalities (**506, 602**) comprising the steps of:
 - recording (**502**) sound of one or more vehicular parts through an instrument (**501**)
 - forwarding (**503**) recorded sound to an vehicle diagnostic module;
 - comparing (**505**) recorded sound with reference sound stored in a reference database module (**504**);
 - detecting (**506**) problem in the vehicle after comparing of the recorded sound;
 - scheduling (**507**) a service if problem is detected and if service is required; and
 - non-scheduling (**508**) of said service if no problem is detected and if service is not required.
3. The vehicle diagnostic method (**160, 170, 300, 400, 500, 600**) as claimed in claim 1, wherein said detecting one or more abnormalities (**506, 602**) comprising the steps of:
 - detecting (**602**) any problem in a vehicle;
 - communicating (**603**) various vehicular parameters to the user;
 - selecting and confirming (**604**) required parameter from the various vehicular parameters by the user;
 - communicating (**605**) diagnosis related modules to the user;
 - selecting (**606**) desired diagnosis related module by the user;

following (607) the communicated diagnosis related module steps to resolve detected problem in the vehicle; and

resolving (608) detected problem in the vehicle.

4. The vehicle diagnostic method (160, 170, 300, 400, 500, 600) as claimed in claim 1, wherein said receiving (105, 305) comprising the steps of:
 - inputting one or more data (201) into data repository (101);
 - validating (202) of said inputted one or more data (201);
 - transferring (203) said validated one or more data (201) through said interface module (106) to user end (204) including said data repository (101);
 - providing (205) an authentication code to the user;
 - enabling (206) authenticated channel of communication between user and a vehicle by inputting said authentication code received by the user; and
 - verification (207) of said authentication code by a verification interface.
5. The vehicle diagnostic method (160, 170, 300, 400, 500, 600) as claimed in claim 1, wherein said communicating (507, 609) comprising the steps of:
 - selecting (401) required service input by the user;
 - checking (402) if automatic service booking is scheduled;
 - detecting (403) fault codes if automatic service booking is scheduled;
 - sending (404) detected fault code along with user details from said data repository (301) to a vehicular service network; and
 - communicating (405) one of the confirmation and non-availability of service appointment to the user.
6. The vehicle diagnostic method (160, 170, 300, 400, 500, 600) as claimed in claim 1, wherein said communicating (507, 609) comprising the steps of:
 - selecting (401) required service input by the user;
 - checking (402) if automatic service booking is scheduled;
 - fetching (406) user details from said data repository (301) if said automatic servicing is not scheduled;
 - communicating non-availability (407) of vehicular service network to the user;
 - communicating availability (408) of the service center if the vehicular service network is available depending upon the inputs required (409); and

- communicating the confirmation (410) of a service appointment through said interface (306).
7. The vehicle diagnostic method (160, 170, 300, 400, 500, 600) as claimed in claim 1, wherein said receiving (105, 305) comprising the steps of:
- editing one or more account settings (701) including user name and password;
 - editing rain alarm settings (702);
 - editing emergency settings (703); and
 - editing SMS settings by enabling addition or deletion of desired contacts (704).
8. The vehicle diagnostic method (160, 170, 300, 400, 500, 600) as claimed in claim 1, wherein said communicating (507, 609) comprising the steps of:
- inputting (802) various details in a feedback form by a user;
 - communicating (803) updated feedback form to a vehicular service network through an interface module (106, 306); and
 - returning (806) if updated feedback form to the user, if the updated feedback form is not sent by the interface module (106, 306) to the vehicular service network.
9. A vehicle diagnostic system (150) for performing real-time diagnosis of faulty vehicular parts in said vehicle, said vehicle diagnostic system (150) comprising:
- one or more modules (100, 200, 300, 400, 500, and 600) configured to perform vehicular diagnosis,
 - wherein,
 - said at least one of one or more modules (100, 200, 300, 400, 500, and 600) includes a sound recording module (300) for detecting one or more abnormalities (506, 602), a vehicle maintenance module (400) for identifying one or more self diagnostic measures (605) enabling fixing of said detected abnormalities (506, 602), and
 - wherein said at least one of one or more modules (100, 200, 300, 400, 500, and 600) is configured to detect abnormality (506, 602) based on at least one of one or more user inputs and one or more critical vehicular inputs.
10. The vehicle diagnostic system (150) as claimed in claim 9, wherein said one or more modules (100, 200, 300, 400, 500, and 600) includes a registration module (100) for registering of the user related details, a service booking module (200) to schedule a service as per user desired date and time, a settings module (500) to perform various

account settings, and a feedback module (600) facilitating communication between the vehicular service network and the user regarding the service provided by the vehicular service network.

11. The vehicle diagnostic system (150) as claimed in claim 9, wherein said registration module (100) performs registering and authenticating said at least one of one or more user inputs and one or more critical vehicular inputs, and said service booking module (200) to schedule a service as per one or more user inputs and one or more critical vehicular inputs.
12. The vehicle diagnostic system (150) as claimed in claim 9, wherein said registration module (100) comprises a data repository (101) including said one or more user inputs, said one or more critical vehicular inputs comprising vehicle number, vehicle type, vehicle class, frame number and the like, an interface module (106) including an authentication module (102) to authenticate the one or more user inputs, and a user end (105) facilitating inputting said one or more user inputs.
13. The vehicle diagnostic system (150) as claimed in claim 9, wherein said registration module (100) performs registration of user's name, registration of vehicle identification number, registration of vehicle type and vehicle class, registration of unique frame number of the vehicle, registration of user's email ID, registration of user's phone number, registration of client's location, and registration of interests of the user.
14. The vehicle diagnostic system (150) as claimed in claim 9, wherein said service booking module (200) comprises a data repository (301) including one or more user inputs, said one or more user inputs includes place, required dealer of the city, service type, required date, required time, and the like, an interface module (306) fetching one or more user inputs from the data repository (301) inputted by the user at an user end (305).

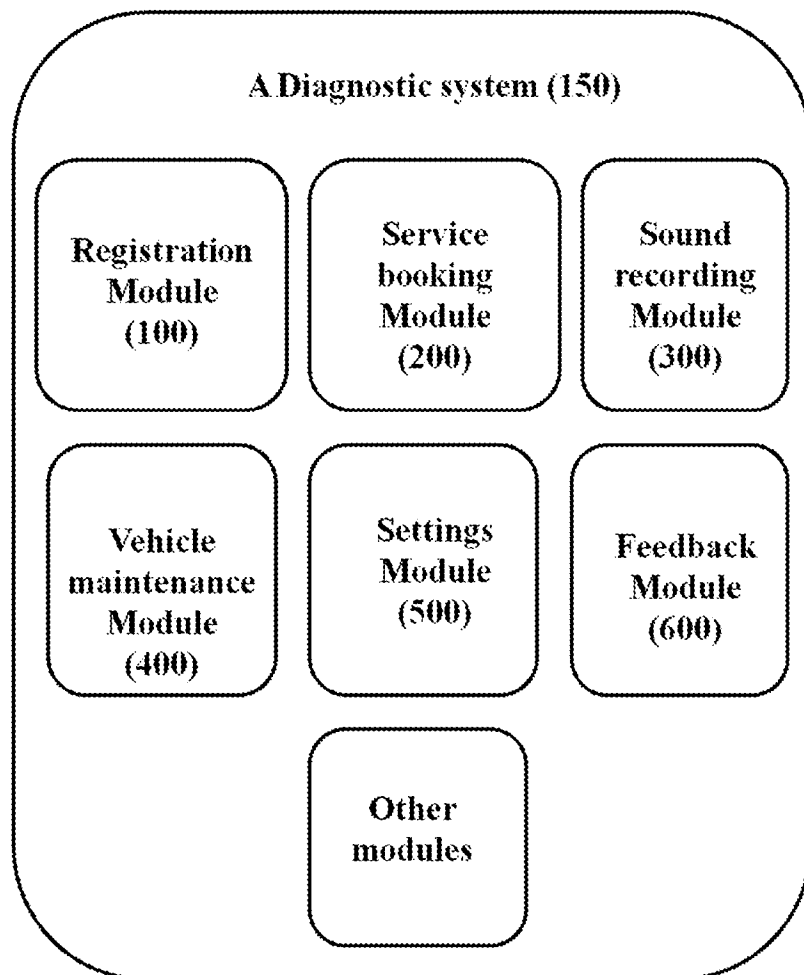


Fig. 1

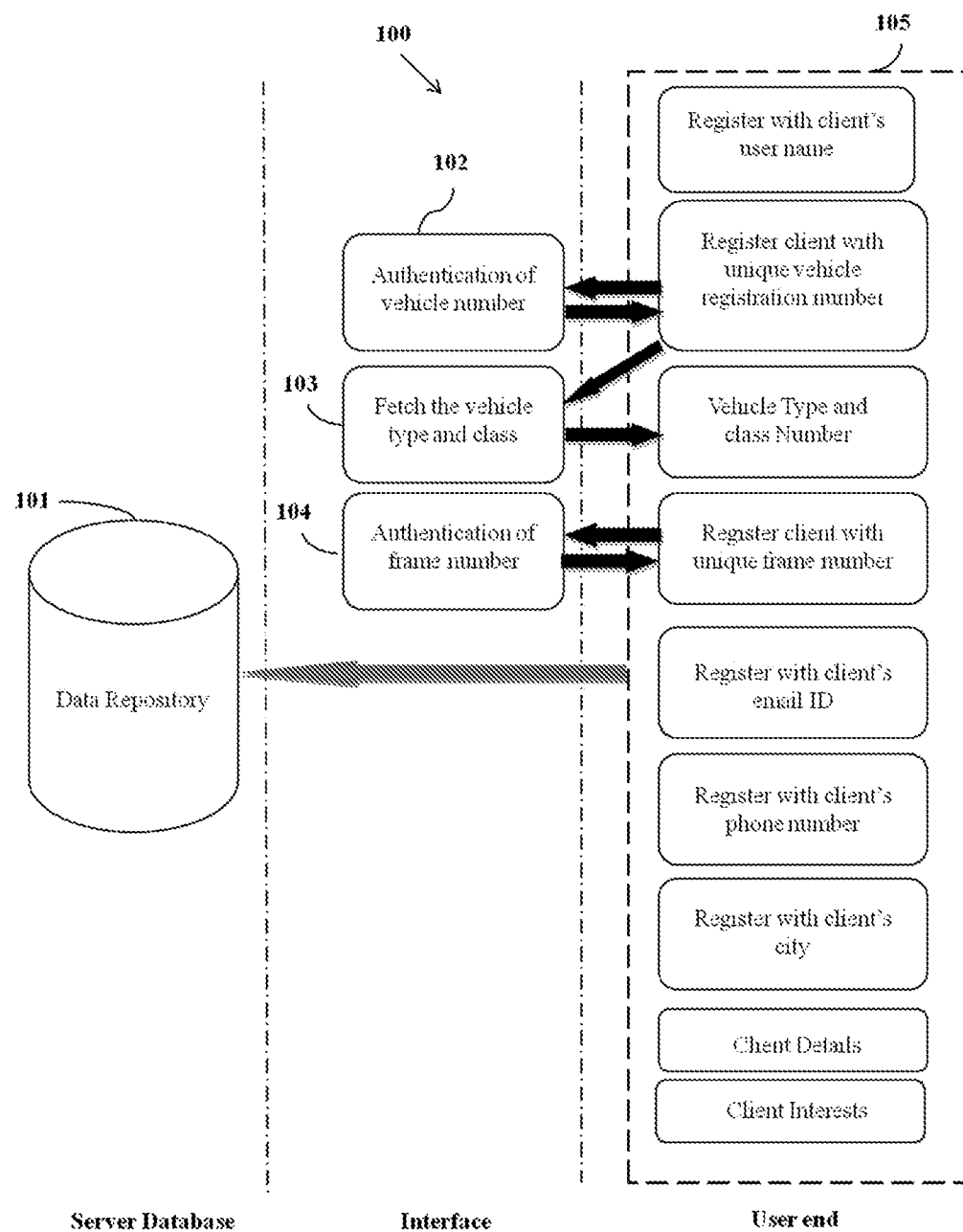


Fig. 2

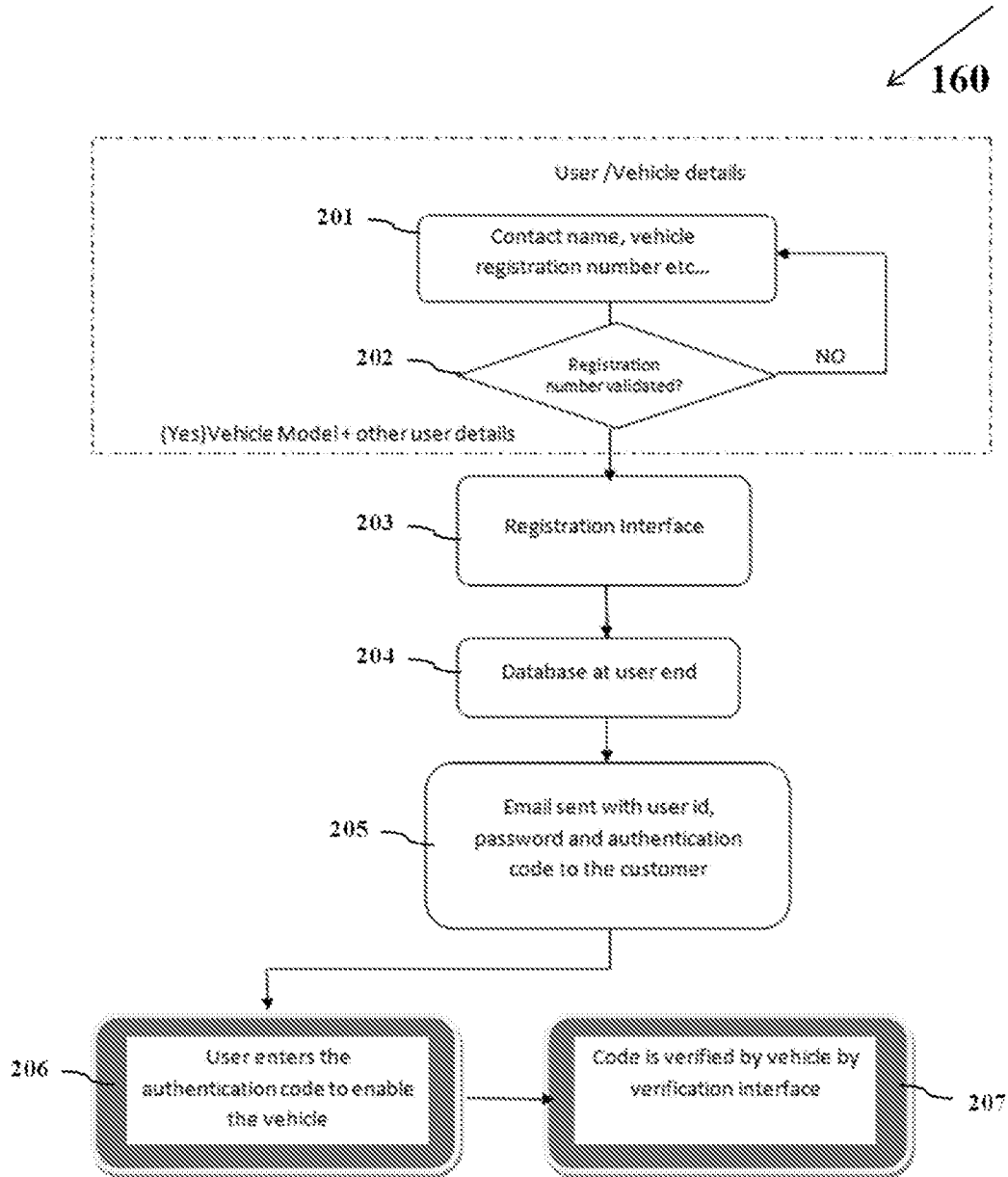


Fig. 3

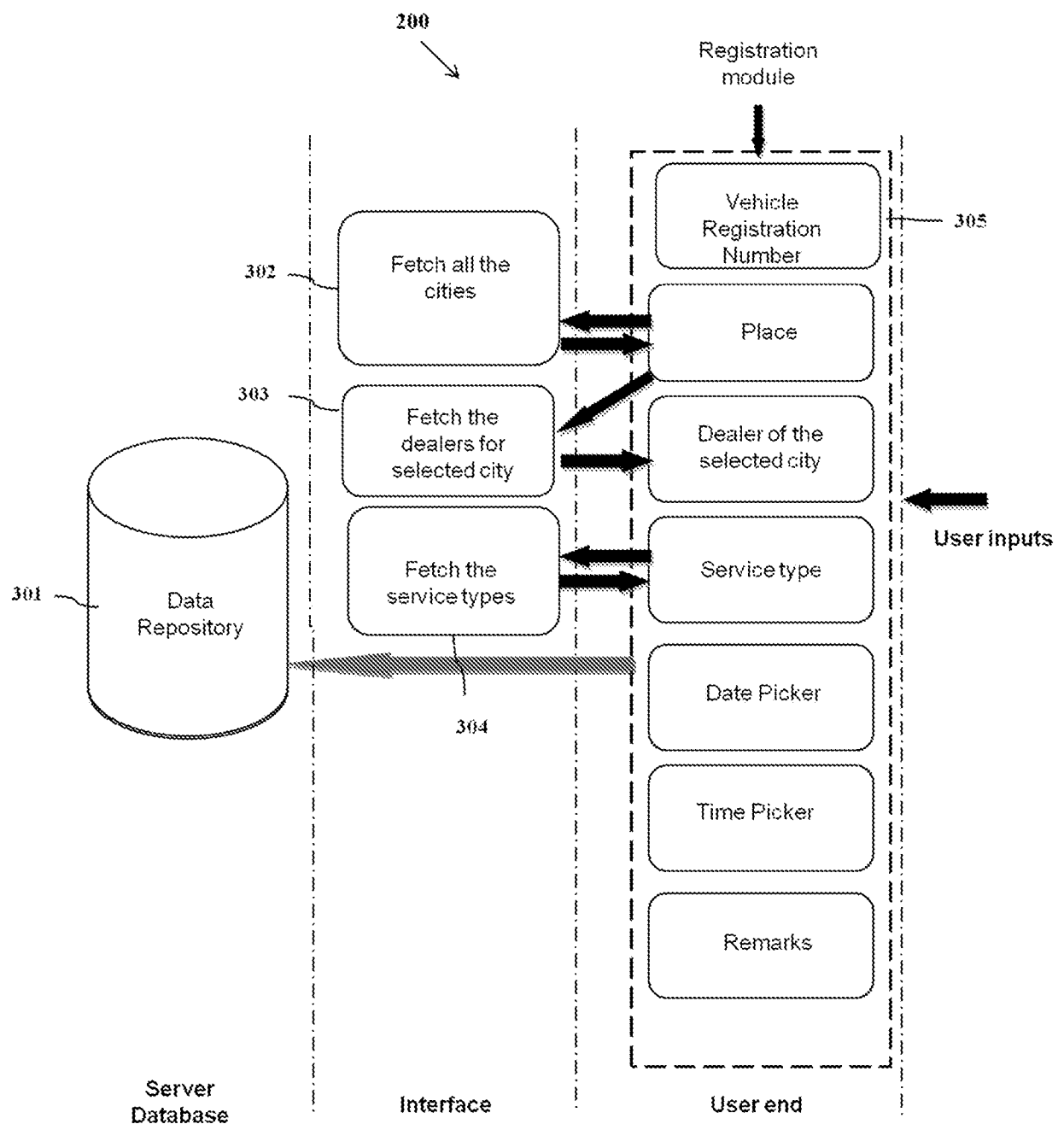


Fig. 4

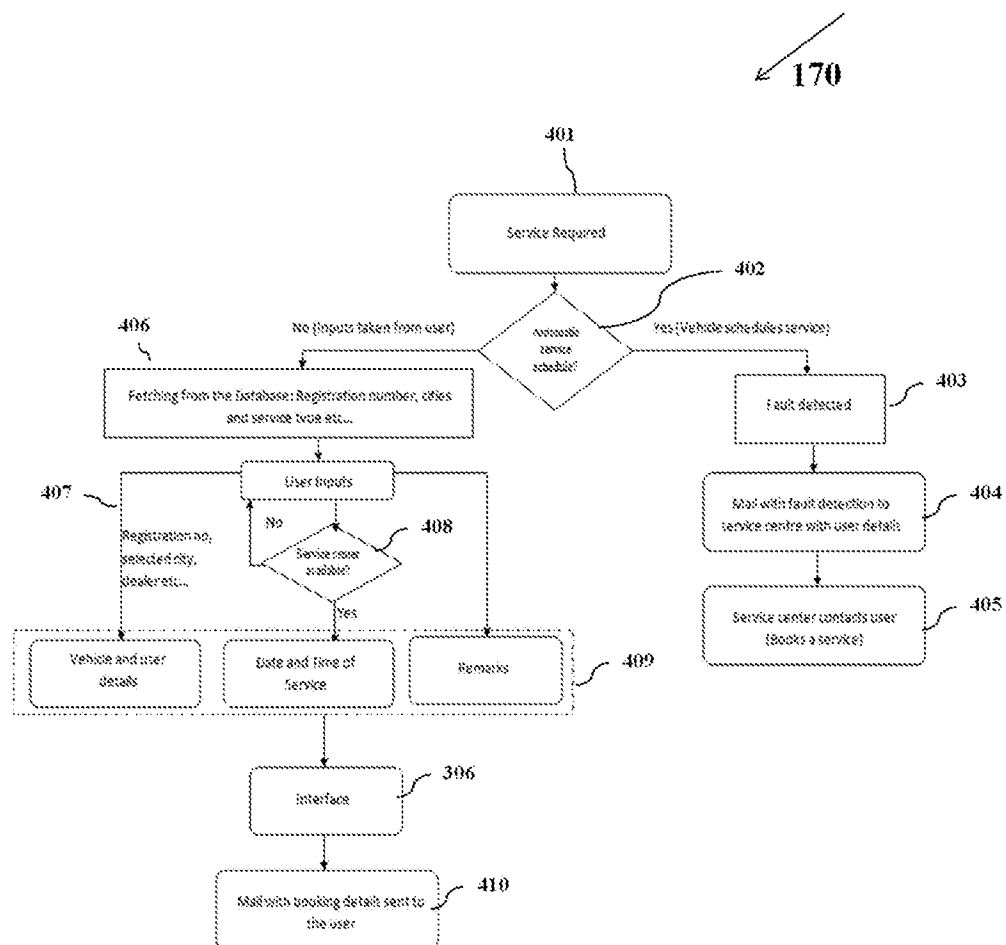


Fig. 5

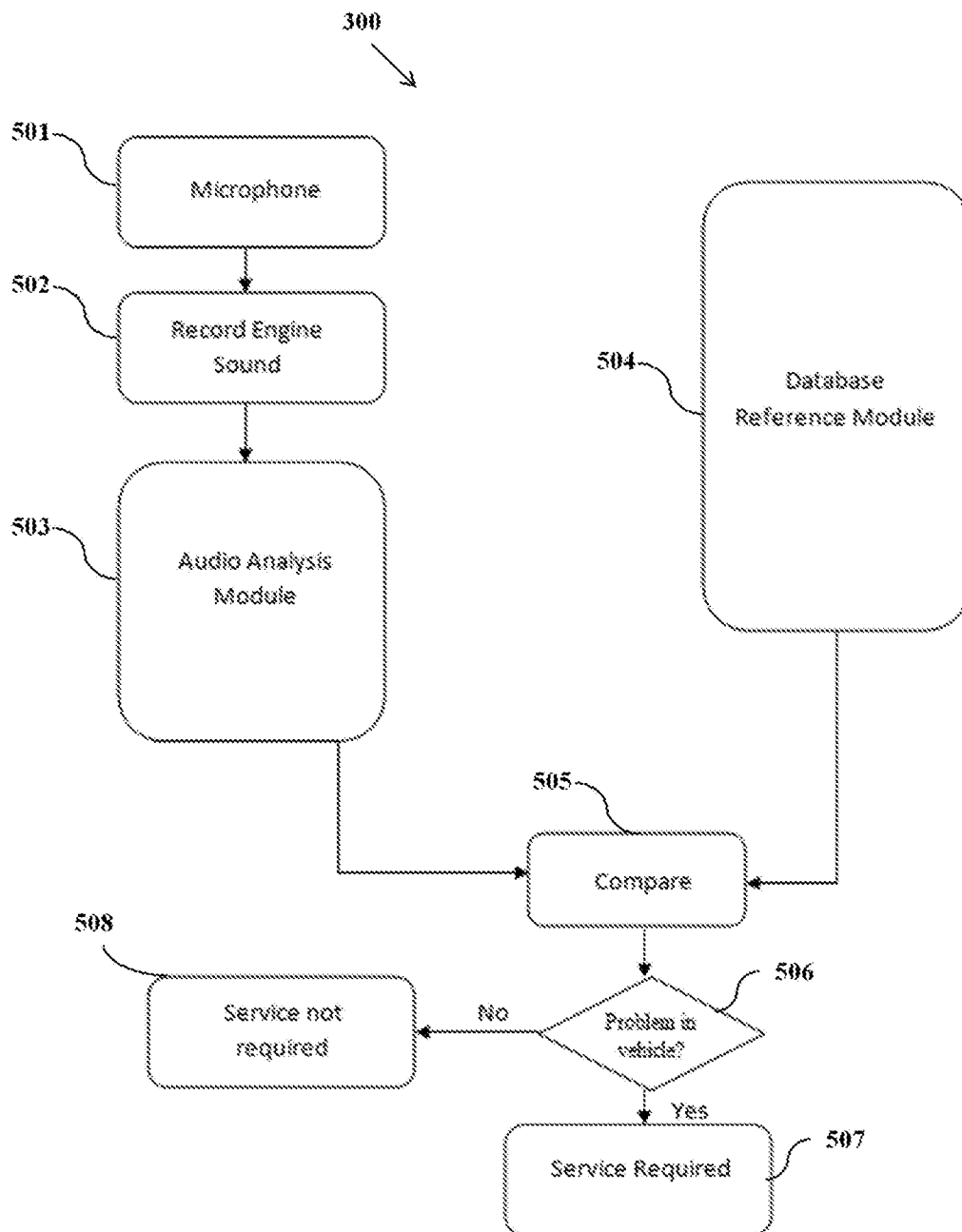


Fig. 6

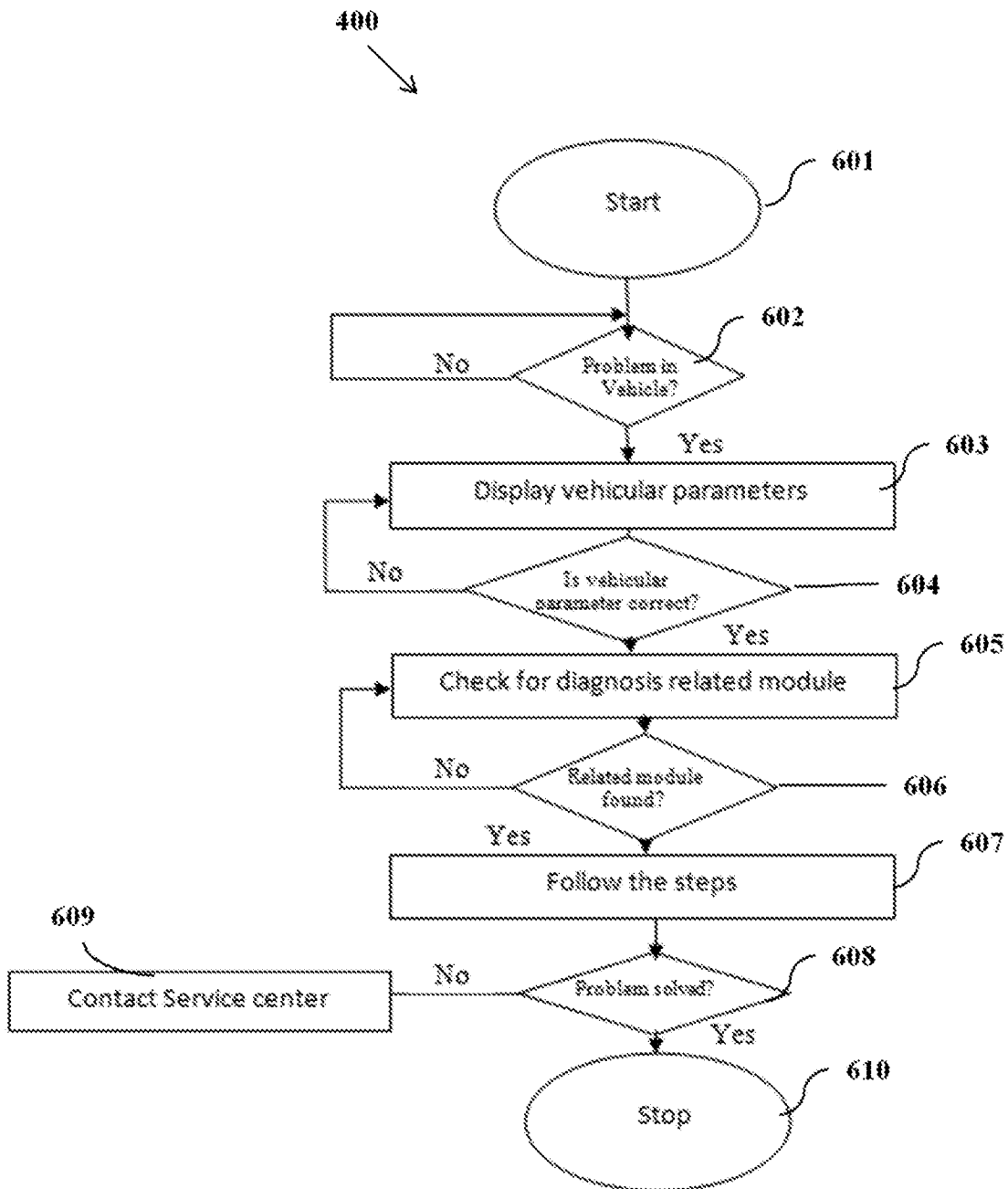
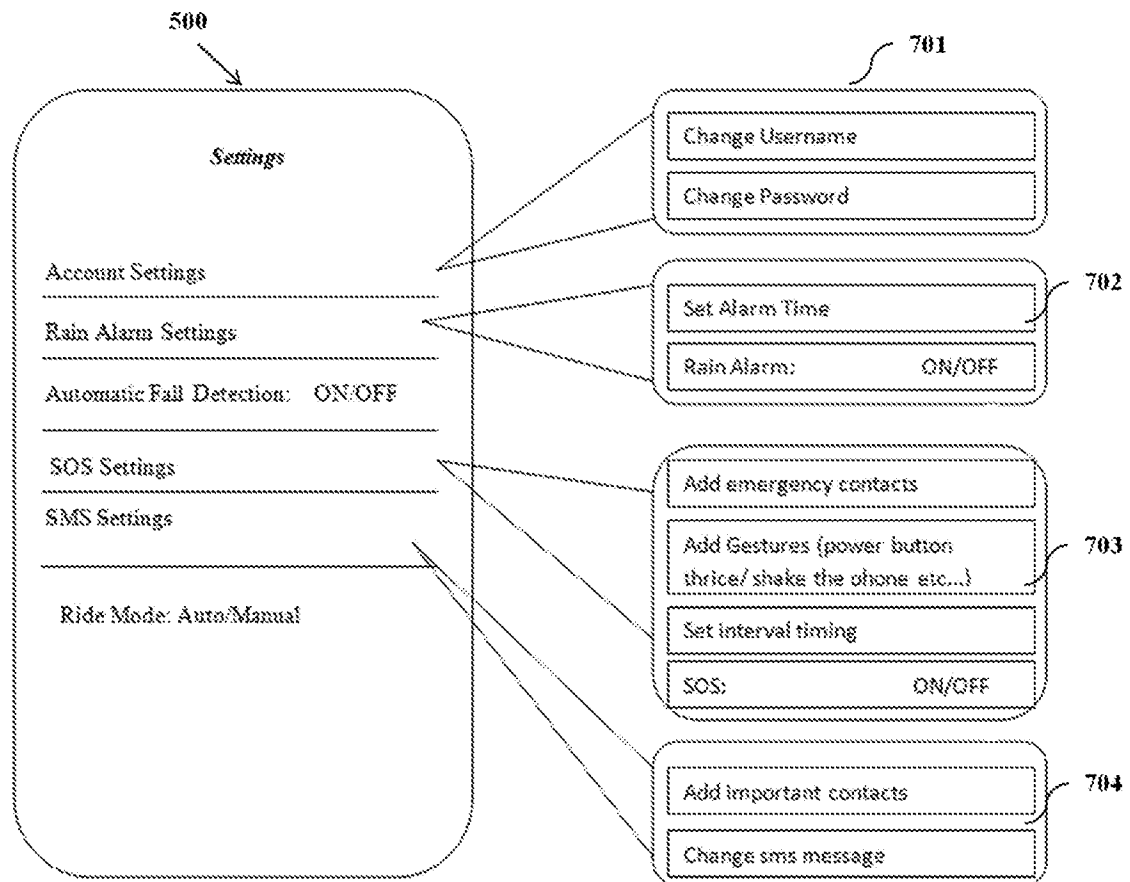


Fig. 7

**Fig. 8**

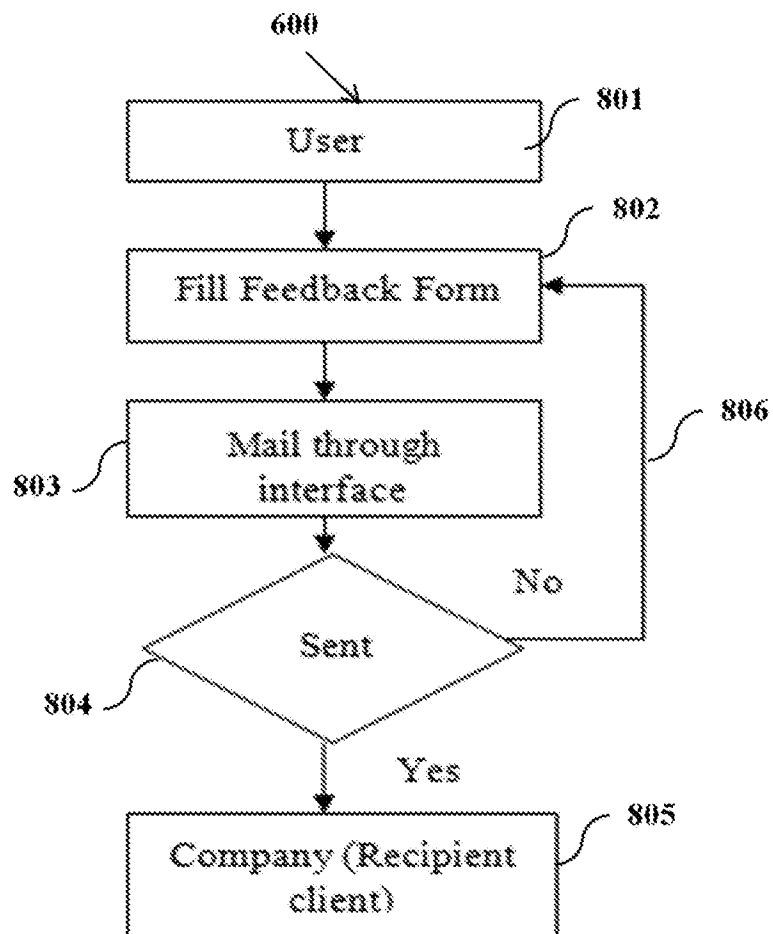


Fig. 9

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2017/056084

A. CLASSIFICATION OF SUBJECT MATTER

INV. G07C5/00 G07C5/08
ADD.

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)

G07C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 330 499 B1 (CHOU PAUL BAO-LUO [US] ET AL) 11 December 2001 (2001-12-11) abstract figures 1-5 column 1, line 41 - line 65 column 3, line 1 - column 9, line 62 -----	1-14
X	US 2016/117928 A1 (HODGES ERIC TODD [US] ET AL) 28 April 2016 (2016-04-28) abstract paragraph [0003] - paragraph [0004] paragraph [0024] - paragraph [0107] figures 1-4 -----	1-14
X	US 2009/216399 A1 (ISHIKAWA TOMOYASU [JP]) 27 August 2009 (2009-08-27) abstract paragraph [0043] - paragraph [0066] ----- -/-	1-14



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

28 February 2018

Date of mailing of the international search report

13/03/2018

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INTERNATIONAL SEARCH REPORT

International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 03/089996 A2 (MOTOROLA INC [US]) 30 October 2003 (2003-10-30) abstract page 1 page 5, line 4 - page 6, line 21 -----	1-14

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2017/056084

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6330499	B1	11-12-2001	NONE
US 2016117928	A1	28-04-2016	US 2016117928 A1 28-04-2016
			US 2017140652 A1 18-05-2017
US 2009216399	A1	27-08-2009	CN 101514942 A 26-08-2009
			JP 4453764 B2 21-04-2010
			JP 2009198393 A 03-09-2009
			US 2009216399 A1 27-08-2009
WO 03089996	A2	30-10-2003	AU 2003218095 A1 03-11-2003
			US 2003200014 A1 23-10-2003
			WO 03089996 A2 30-10-2003