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(54) Title: SPEED LIMITATION OF A VEHICLE

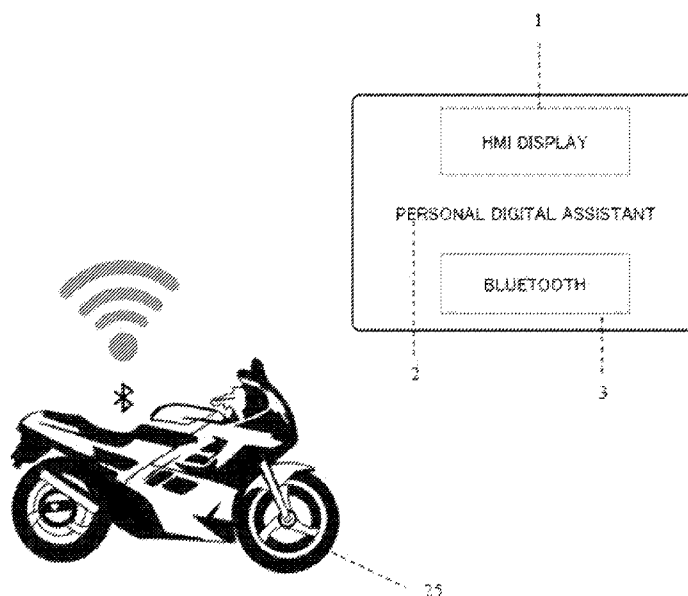


Figure 1

(57) Abstract: The present invention is an access control and speed limiting system for the users of a vehicle. A passcode from a Personal Digital Assistant (PDA) is sent to the connected vehicle to unlock. The passcode from the PDA is decoded by a vehicle-mounted electronic control unit, and the passcode undergoes a verification process 6, 7, 8 and 9 for authentication of the user. Each user in a group sharing the same vehicle has a unique and individual passcode. After the authentication of the rider, the electronic control unit assigns the two-wheeler speed limit 10, 11, 12 and 13. The design improves rider safety and users feel more secure with a passcode lock and can be applied to any two-wheeled or three-wheeled automobiles. Since the passcode can be entered in the PDA by the user, additional buttons need not be provided on the vehicle.



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SPEED LIMITATION OF A VEHICLE

FIELD OF INVENTION

[0001] The present invention relates to a two wheeler and more particularly to a system for controlling access and for limiting the speed of a vehicle based on access type.

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BACKGROUND

[0002] Most families in developing countries such as India use a single motorcycle that is shared by all members of the family. There is a need felt that the speed of the vehicle should be limited depending on the person driving it. If the young college going children are riding the vehicle, then the vehicle speed
10 needs to be limited so that there is less probability of rash driving and road accidents.

[0003] Korean patent publication **KR20020096240** discloses a method and device for limiting the speed of a vehicle with audio password wherein the audio adjustment button can be used to enter a password, and if the password
15 authentication is successful, then a speed limit can be entered. The fuel injection quantity will be controlled to limit the vehicle speed within set value. But such a system requires adjustment buttons on the vehicle which is difficult in a two-wheeled vehicle due to space and ergonomics constraints.

[0004] **CN 103456056 B** titled *“Vehicle anti-theft system and a vehicle
20 anti-theft system working methods”* discloses a vehicle anti-theft system comprising an intelligent key using which a password can be set, and the vehicle can be unlocked by wireless means if the correct password is entered. But such a system requires an intelligent key with inbuilt buttons and processing devices increasing the cost of the vehicle including the intelligent key.

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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.

5 [0006] **Figure 1** shows the system components.

[0007] **Figure 2** shows the process through the application.

[0008] **Figure 3** shows the process through vehicle electronic control unit.

DETAILED DESCRIPTION

10 [0009] The present invention includes an advanced security system in a connected two-wheeler. A passcode from a Personal Digital Assistant (PDA) is sent to the connected vehicle to unlock the two-wheeler. The connection between the PDA and the vehicle will be wired or wireless Bluetooth / Wi-Fi. The passcode from the PDA is decoded by a vehicle-mounted electronic control unit, and the passcode undergoes a verification process for authentication of the user.

15 Each user in a group sharing the same vehicle has a unique and individual passcode. After the authentication of the rider, the electronic control unit sets the two-wheeler speed limit. The prime mover of the vehicle is controlled in order to maintain vehicle speed within the set limit.

20 [00010] The design improves rider safety, and users feel more secure with a passcode lock. The concept can be applied to any two-wheeled or three-wheeled automobiles. The electronic control unit can be a speedometer or an engine control unit or a motor controller.

[00011] **Figure 1** shows the system that includes a connected vehicle which has a Human Machine Interface (HMI) display **1**, a Bluetooth **3** communication with a

25 Personal digital assistant (PDA) **2**. The application which runs on the PDA **2** prompts the user to enter a passcode **5** to unlock the two-wheeler. The user enters the passcode, and the PDA **2** application authenticates the passcode. If the passcode authentication is successful, then the PDA **2** will send encrypted data **14** to unlock the vehicle **15** and to set a specific speed limit dependent on the

passcode. If the passcode authentication fails, the PDA 2 will send encrypted data to lock the vehicle.

5 [00012] An electronic control unit mounted on the vehicle receives the data 16 sent by the PDA 2 and decrypts the data 17 to either enable or disable vehicle operation. If the vehicle is powered by an internal combustion engine, ignition is enabled or disabled based on the encrypted data. Preferably, the electronic control unit is a speedometer mounted on the vehicle and based on the decrypted message from the PDA 2, the speedometer sends appropriate signals to an engine control unit to enable or disable ignition. If the data received is to unlock the vehicle, it
10 also contains information to set a specific speed limit 10, 11, 12, 13. The speedometer will send appropriate signals to the engine control unit so that ignition will be disabled if the specific speed limit is exceeded 21, 22, 23, 24. If the vehicle is powered by an electric motor, then the speedometer communicates with a motor controller to control motor operation.

15 [00013] Since the passcode can be entered in the PDA 2 owned by the user, additional buttons need not be provided on the vehicle.

[00014] The Personal Digital Assistant (PDA) 2 can be a Smartphone or a tablet PC. The communication between the PDA 2 and the electronic control unit mounted on the vehicle can be through the wireless communication protocol such as Bluetooth 3 or Wi-Fi or wired communication protocol such as USB. The
20 as Bluetooth 3 or Wi-Fi or wired communication protocol such as USB. The above-mentioned and other modifications are possible without departing from the spirit and scope of the invention. Since the passcode can be entered in the PDA 2 owned by the user, additional buttons need not be provided on the vehicle.

[00015] Figure 2 shows the process by a dedicated software application on PDA
25 2 is used to control the vehicle speed limit. A PDA 2 is connected to the two-wheeler via any wireless or wired communication via the commands sent by the software application 4. Once a passcode is entered by the user 5, the data is verified for authentication of the right user. A defined speed limitation data is stored in the application database for each passcode 6, 7, 8, 9. If the passcode
30 matches with any one of the authenticated passcode, corresponding speed

limitation data is fetched **10, 11, 12, 13**. The fetched data thereby encrypted **14** and sent to the two-wheeler **15**. The data also includes information on authentication.

[00016] **Figure 3** shows process at an electronic control unit checks for the data received from the external PDA **16** for authentication of right PDA device and user. Once the user is verified the received data undergoes decryption process to check the passcode **17**. After the successful decryption of data **9, 18, 19, 20** this dedicated controller shall command the engine control unit to set a speed saturation value **10a, 11a, 12a, 13a**. The speed control of the vehicle can be in any method. The supply to TCI is regulated at an upper value of 21, 22, 23 & 24 to maintain the vehicle upper speed to values 10, 11, 12 & 13 once the vehicle speed reaches the assigned speed values 10, 11, 12 & 13. Hence, in spite of the user demand of higher speed, the TCI controls the upper vehicle speed value assigned to each user.

WE CLAIM:

1. An access control and speed limiting system for a vehicle comprising:
 - a Human Machine Interface (HMI) display (1);
 - a Personal digital assistant (PDA) (2);
 - a Bluetooth (3);
 - an application (4);
 - a speedometer;
 - an electronic control unit; and
 - a plurality of set of data, wherein:
 - the PDA (2) communicates to the electronic control unit mounted on the vehicle through wireless communication protocol such as the Bluetooth (3);
 - and
 - the PDA (2) encompasses an application which when activated on the PDA (2), a user is capable to utilize the PDA (2) to key in a user specific passcode.
2. The access control and speed limiting system of Claim 1, wherein the application in the PDA (2) prompts the user to enter a passcode (5) to unlock the vehicle by authenticating said user through said passcode by the application.
3. The access control and speed limiting system of claim 1 or claim 2, wherein upon successful authentication the PDA (2) sends encrypted data (14) to unlock the vehicle (15) and to set a specific speed limit dependent on the passcode.
4. The access control and speed limiting system of claim 1 or claim 2, wherein if the passcode authentication fails, the PDA (2) will send encrypted data to keep the vehicle locked.

5. The access control and speed limiting system of Claim 1, wherein the electronic control unit can either be a speedometer or an engine control unit or a motor controller.
6. The access control and speed limiting system of claim 1, wherein the electronic control unit receives the data (16) from the PDA (2) and decrypts to either enable or disable vehicle operation and in a vehicle powered by an internal combustion engine, ignition is enabled or disabled based on the encrypted data.
7. The access control and speed limiting system of claim 1, wherein the electronic control unit receives the data (16) from the PDA (2) and decrypts to either enable or disable vehicle operation and if the electronic control unit is a speedometer mounted on the vehicle, the speedometer sends appropriate signals to an engine control unit to enable or disable ignition.
8. The access control and speed limiting system of claim 1, wherein the electronic control unit receives the data (16) from the PDA (2) and decrypts to either enable or disable vehicle operation and for a vehicle powered by an electric motor the speedometer communicates with a motor controller to control motor operation.
9. The access control and speed limiting system for a vehicle of 1, wherein the communication between the PDA (2) and the electronic control unit mounted on the vehicle can be through the wireless communication protocol such as Bluetooth (3) or Wi-Fi or wired communication protocol such as USB.
10. The access control and speed limiting system as claimed in claim 1 wherein the software application on the PDA (2) is used to control the vehicle speed limit.
11. A method of access control and speed limiting system for a vehicle, said vehicle having, a Human Machine Interface (HMI) display (1), a Personal digital assistant (PDA) (2), a Bluetooth (3), an application (4), a speedometer, an electronic control unit, and plurality of set of data, said method comprising the steps of:

controlling speed limit of the vehicle by the application on the PDA (2, further comprising the steps of:

entering a passcode by a user (5) and verifying the data for authentication;

fetching the corresponding speed limitation data (10), (11), (12), (13) from application database which is stored for each passcode (6), (7), (8), (9), if the passcode matches with any one of authenticated passcodes; and

encrypting the fetched data (14) which includes information of authentication and forwarding to the vehicle (15); and

controlling speed of the vehicle by the electronic control unit further comprising the steps of:

receiving the data (16) from the PDA (2) by the electronic control unit and decrypting the data (17);

checking the received data from the external PDA (16) by the electronic control unit for authentication of right PDA device and user;

decrypting the received data (9), (18), (19), (20), to check the passcode (17);

setting a speed saturation value (10a), (11a), (12a), (13a) by the electronic control unit on successful decryption by sending a command to the engine control unit; and

regulating by the electronic control unit, at an upper value of (21), (22), (23) & (24) to maintain the vehicle upper speed to values (10), (11), (12) & (13) once the vehicle speed reaches the assigned speed values (10), (11), (12) & (13).

12. The method of access control and speed limiting system for a vehicle as claimed in claim 11 wherein the limiting of vehicle upper speed to values (10), (11), (12) & (13) once the vehicle speed reaches the assigned speed values (10), (11), (12) & (13) is performed by TCI through parameters (21), (22), (23) & (24).

13. The method of access control and speed limiting system for a vehicle as claimed in claim 11 or claim 12 wherein the limiting of vehicle upper speed to values (10), (11), (12) & (13) once the vehicle speed reaches the assigned speed values (10), (11), (12) & (13) is performed by cutting supply to TCI.

14. The method of access control and speed limiting system as claimed in claim 11 wherein the Personal Digital Assistant (PDA) (2) can be a smartphone or a tablet PC.

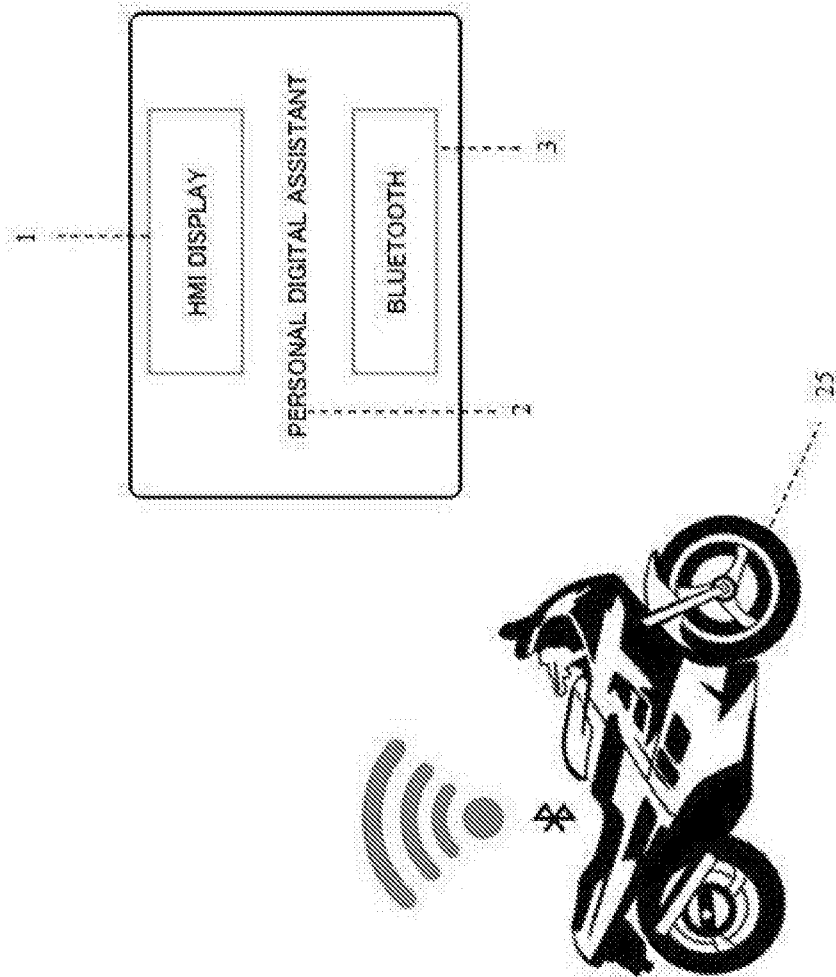


Figure 1

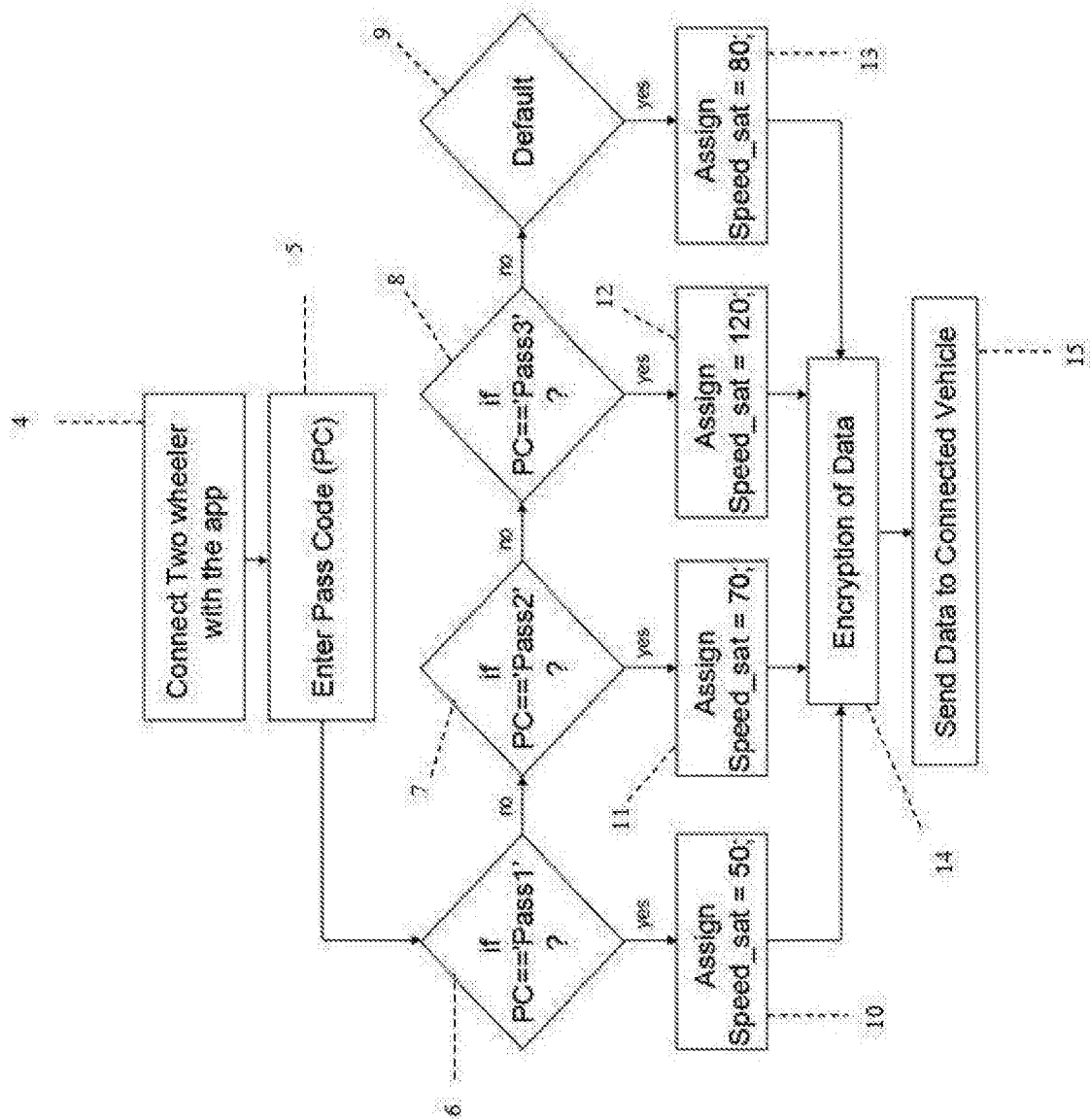


Figure 2

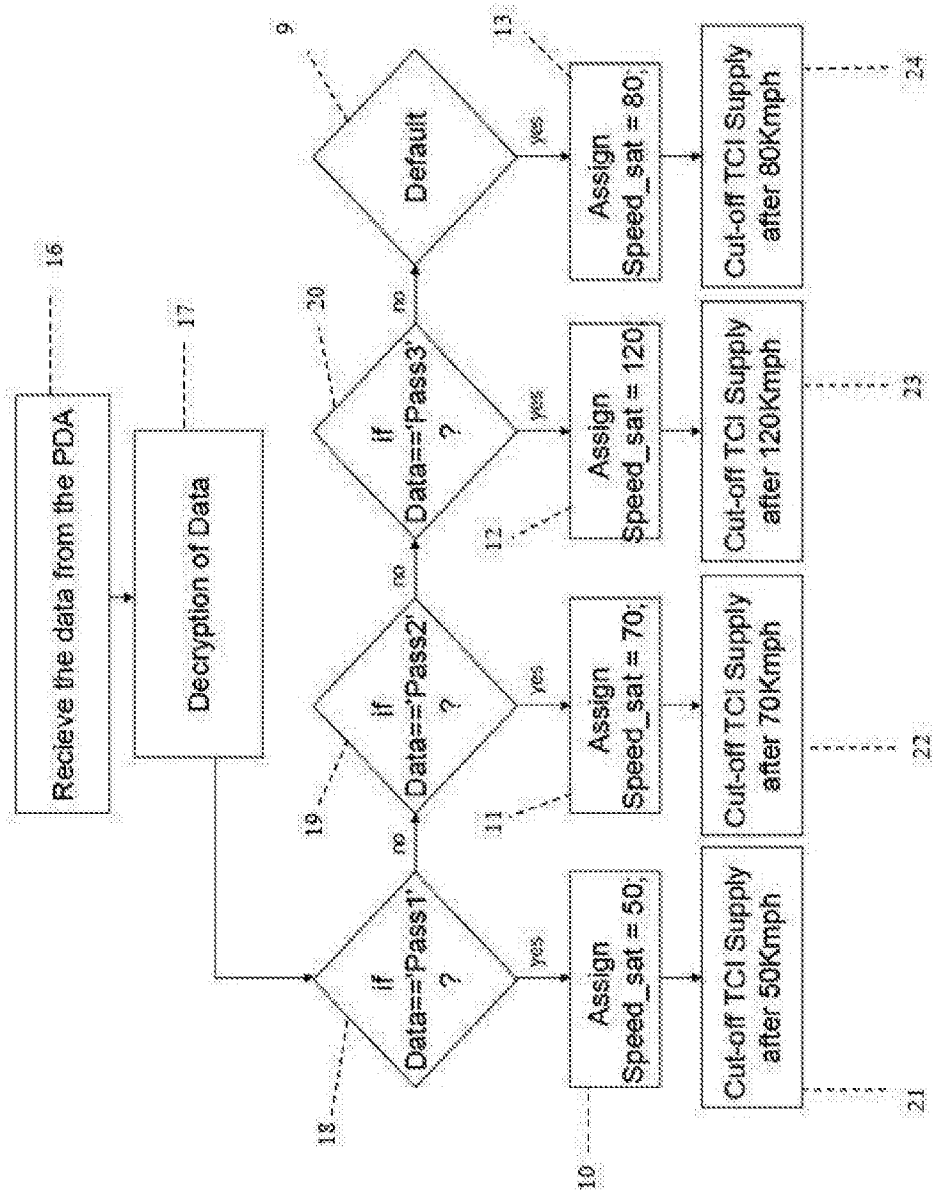


Figure 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2017/055125

A. CLASSIFICATION OF SUBJECT MATTER
H04L29/00,G06F17/00 Version=2017.01

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)

G06F, H04L

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)

Databases: Patseer, IPO Internal Database.
Search terms: speed control ,authentication

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO2014205345A2 (CLINICAL PRODUCT DEV LTD) 24 DECEMBER 2014 (24/12/2014) Paragraphs [0008]-[0023]; [0042]-[0068]; [0189]; [0322]-[0324]	1-14
X	US20090177336 A1 (MCCLELLAN Scott et al.) 09 JULY 2009 (09/07/2009) Paragraphs [0017]-[0025]; [0032]-[0041];	1-14

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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INTERNATIONAL SEARCH REPORT
Information on patent family members

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Citation	Pub.Date	Family	Pub.Date
WO 2014205345 A2	24-12-2014	EP 3010791 A2	27-04-2016
		CA 2916204 A1	24-12-2014
		AU 2014284215 A1	28-01-2016
US 20090177336 A1	09-07-2009	WO 2009088981 A1	16-07-2009