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(54) DRIVER IDENTIFICATION SYSTEM FOR RAIL VEHICLES

FAHRERIDENTIFIKATIONSSYSTEM FÜR SCHIENENFAHRZEUGE

SYSTÈME D'IDENTIFICATION DE CONDUCTEUR POUR VÉHICULES FERROVIAIRES

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(73) Proprietor: **ALSTOM Transport Technologies 93400 Saint-Ouen (FR)**

(72) Inventor: **VIEILLE-GIRARDET, Gilles 12038 SAVIGLIANO (IT)**

(74) Representative: **Lavoix 2, place d'Estienne d'Orves 75441 Paris Cedex 09 (FR)**

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Description

[0001] The present invention relates to a driver identification system for rail vehicles.

[0002] It is well known that when a driver of a rail vehicle has to enter the cabin of the rail vehicle for starting his job, he accesses such cabin by using a standard key, which allows him to unblock the cabin door.

[0003] Then, after entering the cabin, data of the driver such as the driver license number, the train mission number, etc. are recovered by the driver himself by performing a manual login on a dedicated account through a display located on a driver desk of the cabin. In particular, a driver badge is read through a badge reader placed on the driver desk, or generally within the cabin, so that the driver is identified. The correct identification of the driver enables the login steps on the console, which allows the driver to manually set the driver data.

[0004] The badge of prior art systems has a well-known chip for its reading.

[0005] At this point, driving parameters of the driver such as the screen language and screen brightness, temperature settings in cab, seat height are further manually and sequentially set by the driver itself through the same dedicated account or area to which he has logged in.

[0006] The reading of the badge allows the automatic activation of the cabin as defined in the UIC612-0 standard, as well as the transmission of the data of the driver to the onboard equipment (TCMS, event recorder, safety equipment, etc.) for storage in the Train Control and Monitoring System events recorder and in the juridical recorders of the train.

[0007] The above disclosed solution firstly requires the use of a standard badge with electronic chip for the driver identification, thus penalizing the use of any other more innovative and modern solution; then, the actual use of the data is limited to their transmission to the provided equipment (rail vehicle recorder and safety equipment) for the circulation of the rail vehicle on the railway tracks.

[0008] Moreover, the driver has in any case to use a standard key, as above cited, for entering the cabin, while the badge is used for starting the driver identification operations, thus causing a waste of time in the global activation of the rail vehicle.

[0009] Document US 2014/309868 discloses a method for determining a presence of a user inside a vehicle and for exchanging data between a user and devices associated with the vehicle, to provide an enhanced user experience making the automobile more useful and more efficient. A device can communicate with a vehicle control system to determine functionalities to be provided to a user, inclusive of unlocking of a door of the vehicle. The device can receive input from a user and have access to profile data.

[0010] Document US 8,626, 357 discloses a vehicle system for setting driver preferences settings for a vehicle, wherein the vehicle system includes a plurality of fobs configured to wirelessly communicate with a main

control unit.

[0011] Document US 6,505,780 discloses a system for personalizing vehicle settings by using a communication device capable of communicating data to the vehicle.

5 **[0012]** Document US 6, 198, 996 discloses an onboard computer used to control many aspects of a vehicle, including performance and ride characteristics. Furthermore, a smart card key is used to authorize a user and the smart card key stores user preference data, such as performance and ride parameters, which are in turn used by the onboard computer to adjust performance and ride characteristics of the vehicle.

10 **[0013]** Object of the present invention is therefore to provide a driver identification system for rail vehicles which does not require the use of badge with electronic chip together with a standard key for entering the cabin and activating the rail vehicle, thus overcoming the problem of the prior art.

15 **[0014]** This and other objects are achieved by a driver identification system for rail vehicles having the characteristics defined in claim 1.

20 **[0015]** The use of a contactless reader for reading driver data allows using innovative techniques such as RFID (Radio Frequency Identification) or NFC (Near Field Communication) devices for identifying the driver and further activating the rail vehicle.

25 **[0016]** These technologies are nowadays largely employed and are based on very common devices which provide high security level in the data transmission.

30 **[0017]** The contactless reading let the driver improve the driving conditions by automating a plurality of operations, these steps being previously manually done.

35 **[0018]** Particular embodiments of the invention are the subject of the dependent claims, whose content is to be understood as integral part of the present description.

40 **[0019]** Further characteristics and advantages of the present invention will become apparent from the following description, provided merely by way of a non-limiting example, with reference to the enclosed drawings, in which:

- Figure 1 shows a schematic lateral view of a cabin of a rail vehicle;
- Figure 2 shows an enlarged view of the contactless reading device; and
- Figure 3 is an expanded view of a driver desk.

45 **[0020]** Briefly, the driver identification system for rail vehicles according to the present invention includes a contactless reading device used to acquire driver data for automatically configuring cabin parameters and setting driving parameters.

50 **[0021]** The contactless reading device is used in association with a personal identification device of the driver such as a contactless badge, a smartphone or a tablet.

55 **[0022]** The contactless reading device is compatible with predetermined technologies such as RFID in case of use of a contactless badge or NFC in case of use of

smartphones or tablets.

[0023] With the system of the present invention additional data can be read, for example the number of train missions.

[0024] Figure 1 shows a schematic lateral view of a cabin 1 of a rail vehicle having a contactless reading device 2 next to an entry door 4 of the cabin 1. In figure 1, the contactless reading device 2 is placed next to the dedicated driver door 4, for example on high speed trains or locomotives. Alternatively, the contactless reading device 2 is placed next to a passenger door also used by the driver, for example on regional trains.

[0025] The reading device 2, shown in enlarged view in figure 2, is wirelessly activated by a personal identification device 6 such as a badge, a smartphone or a tablet of the driver.

[0026] The reading device 2 is powered by well-known train batteries, so as to be used both when the rail vehicle is powered and when the rail vehicle is not supplied.

[0027] The contactless reading device 2 is arranged to acquire, in a manner per se known, an identification code of the driver associated with the personal identification device 6.

[0028] The identification code is associated, in a manner known per se, with driver data such as, the height and weight of the driver, the used language, the train mission number, etc.

[0029] Figure 3 shows an enlarged view of a driver desk 8, placed in the cabin 1, arranged to wirelessly communicate with the reading device 2 so as to receive said identification code and to set accordingly cabin and driving parameters.

[0030] The identification code acquired by the contactless reading device 2 is sent to an electronic control unit 13 of the driver desk 8 which firstly checks if the identification code is valid, i.e. if it is intact and correctly recognized.

[0031] If the identification code received is valid, the electronic unit 13 of the cabin 1 unblocks the entry door 4 and then it customizes cabin and driving parameters as a function of the driver data associated with the identification code received, as herein below disclosed.

[0032] According to the invention, the control unit 13 is arranged to set cabin and driving parameters of the rail vehicle based on the driver data by setting the position of a chair 10 in the cabin 1 (as a function of the height of the driver); setting the position (height) of the driver activity pedal 9 under the driver desk 8 (as a function of the height of the driver); setting the language of the console 8; displaying driving parameters (such as for example a route assigned to the driver) on displays 12 of the driver desk 8.

[0033] Examples of automatic customization of cabin and driving parameters include:

- switching on cabin lights and on the corridor to access to the cab;
- setting the retro illumination of the driver desk 8

and/or the instruments of the driver desk 8, including the display 12;

- setting the offset of the cabin temperature (+/- 4°C) with respect to a predetermined reference value;
- setting the language of the display 12 for the cross-border rail vehicles.

[0034] Advantageously, the control unit 13 also performs automatically the following operations:

- giving power to the rail vehicle in case it is not supplied;
- enabling automatically the cabin 1 before the driver enters it;
- transmitting the driver data to a per se known safety equipment device, to an events recorder device and to a system for managing the train mission (onboard information system to passengers) of the rail vehicle for further elaborations per se known;

[0035] The main advantages of the present invention are the followings:

- using of identification means more innovative, sure and compatibles with other technologies employed by the rail companies;
- improving of the driving conditions for the driver thanks to the automatic setting of cabin and driving parameters;
- saving time in the full activation of the cabin;
- simplifying the operations for entering the cabin.

[0036] Clearly, the principle of the invention remaining the same, the embodiments and the details of production can be varied considerably from what has been described and illustrated purely by way of non-limiting example, without departing from the scope of protection of the present invention as defined by the attached claims.

Claims

1. Driver identification system for rail vehicles comprising:

- a contactless reading device (2) placed next to an entry door (4) of a rail vehicle;
- a personal identification device (6) associated with an identification code of a driver of the rail vehicle, said identification code being associated with driver data;

wherein the contactless reading device (2) is arranged to:

- acquire wirelessly said identification code;
- send wirelessly the identification code to an electronic control unit (13) of a cabin (1) of the

rail vehicle, said control unit (13) being arranged to automatically unblocking the entry door (4) and to set cabin and driving parameters of the rail vehicle based on the driver data; **characterized in that** the driver data comprise the height of the driver, the weight of the driver, the used language, the train mission and the cabin (1) comprises a driver desk (8) arranged to host the control unit (13), and wherein the control unit (13) is arranged to set cabin and driving parameters of the rail vehicle based on the driver data by:

- setting the position of a chair (10) in the cabin (1);
- setting the position of the driver activity pedal (9) under the driver desk (8);
- setting the language of the console (8);
- displaying driving parameters on displays (12) of the driver desk (8).

2. The system of claim 1, wherein the control unit (13) is further arranged to set the cabin and driving parameters of the rail vehicle by:

- switching on cabin lights and on the corridor to access to the cab;
- setting the retro illumination of the driver desk (8) and/or the instruments of the driver desk (8), including the display 12;
- setting the offset of the cabin temperature with respect to a predetermined reference value.

3. The system of any of the preceding claims, wherein the personal identification device (6) comprises a badge, a smartphone or a tablet.

Patentansprüche

1. Fahreridentifikationssystem für Schienenfahrzeuge, umfassend:

- eine berührungslose Lesevorrichtung (2), die neben einer Eingangstür (4) eines Schienenfahrzeugs platziert ist;
- eine persönliche Identifizierungsvorrichtung (6), die mit einem Identifizierungscode eines Fahrers des Schienenfahrzeugs assoziiert ist, wobei der Identifizierungscode mit den Daten des Fahrers assoziiert ist; wobei die berührungslose Lesevorrichtung (2) zu Folgendem angeordnet ist:

- drahtlosem Erfassen des Identifizierungs-codes;
- drahtlosem Senden des Identifizierungs-codes an eine elektronische Steuereinheit

(13) einer Kabine (1) des Schienenfahrzeugs, wobei die Steuereinheit (13) angeordnet ist, um die Eingangstür (4) automatisch zu entriegeln und Kabinen- und Fahrparameter des Schienenfahrzeugs basierend auf den Fahrerdaten einzustellen; **dadurch gekennzeichnet, dass** die Fahrerdaten die Größe des Fahrers, das Gewicht des Fahrers, die verwendete Sprache, die Zugmission umfassen und die Kabine (1) ein Fahrerpult (8) umfasst, das angeordnet ist, um die Steuereinheit (13) zu beherbergen, und wobei die Steuereinheit (13) angeordnet ist, um Kabinen- und Fahrparameter des Schienenfahrzeugs basierend auf den Fahrerdaten einzustellen, durch:

- Einstellen der Position eines Stuhls (10) in der Kabine (1);
- Einstellen der Position des Fahreraktivitätspedals (9) unter dem Fahrerpult (8);
- einstellen der Sprache der Konsole (8);
- Anzeigen von Fahrparametern auf den Anzeigen (12) des Fahrerpults (8).

2. System nach Anspruch 1, wobei die Steuereinheit (13) ferner angeordnet ist, um die Kabinen- und Fahrparameter des Schienenfahrzeugs einzustellen, durch:

- Einschalten von Kabinenleuchten und im Gang zum Zugang zu der Kabine;
- Einstellen der Hinterleuchtung des Fahrerpults (8) und/oder der Instrumente des Fahrerpults (8), einschließlich der Anzeige 12;
- Einstellen des Offsets der Kabinentemperatur in Bezug auf einen vorbestimmten Referenzwert.

3. System nach einem der vorherigen Ansprüche, wobei die persönliche Identifizierungsvorrichtung (6) einen Ausweis, ein Smartphone oder ein Tablet umfasst.

Revendications

1. Système d'identification de conducteur pour véhicules ferroviaires comprenant :

- un dispositif de lecture sans contact (2) placé à côté d'une porte d'entrée (4) d'un véhicule ferroviaire ;
- un dispositif d'identification personnel (6) associé à un code d'identification d'un conducteur du véhicule ferroviaire, ledit code d'identification

étant associé aux données du conducteur ;

dans lequel le dispositif de lecture sans contact (2) est agencé pour :

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acquérir sans fil ledit code d'identification ;
 envoyer sans fil le code d'identification à une unité de commande électronique (13) d'une cabine (1) du véhicule ferroviaire, ladite unité de commande (13) étant agencée pour débloquer automatiquement la porte d'entrée (4) et pour régler les paramètres de la cabine et de la conduite du véhicule ferroviaire sur la base des données du conducteur ; **caractérisé en ce que** les données du conducteur comprennent la taille du conducteur, le poids du conducteur, la langue utilisée, la mission du train et la cabine (1) comprend un pupitre du conducteur (8) agencé pour loger l'unité de commande (13), et dans lequel l'unité de commande (13) est agencée pour régler les paramètres de la cabine et de la conduite du véhicule ferroviaire sur la base des données du conducteur par :

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- réglage de la position d'une chaise (10) dans la cabine (1) ; 25
- réglage de la position de la pédale d'activité du conducteur (9) sous le pupitre du conducteur (8) ;
- réglage de la langue de la console (8) ; 30
- affichage des paramètres de conduite sur les écrans (12) du pupitre du conducteur (8).

2. Système selon la revendication 1, dans lequel l'unité de commande (13) est en outre agencée pour régler les paramètres de la cabine et de la conduite du véhicule ferroviaire par :

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- allumage de l'éclairage de la cabine et du couloir d'accès à la cabine ; 40
- réglage du rétro-éclairage du pupitre du conducteur (8) et/ou des instruments du pupitre du conducteur (8), y compris l'écran 12 ;
- réglage du décalage de la température de la cabine par rapport à une valeur de référence prédéterminée. 45

3. Système selon l'une quelconque des revendications précédentes, dans lequel le dispositif d'identification personnel (6) comprend un badge, un smartphone ou une tablette.

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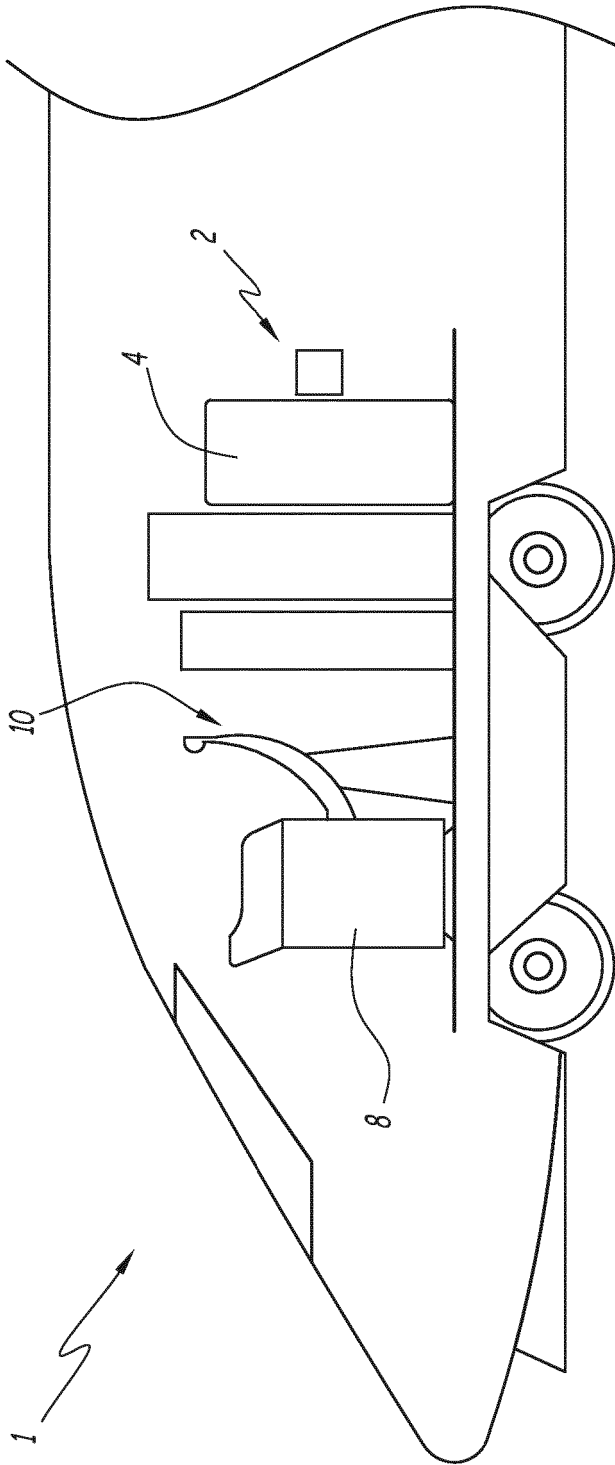


Fig.1

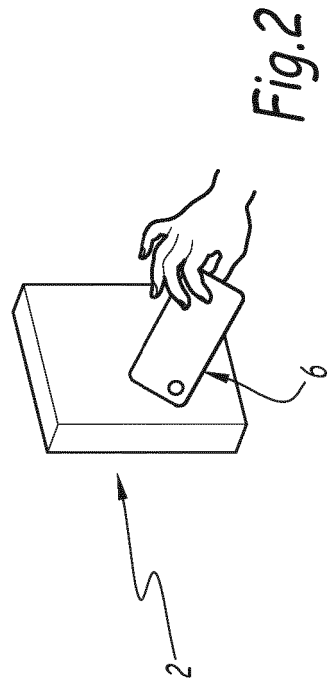
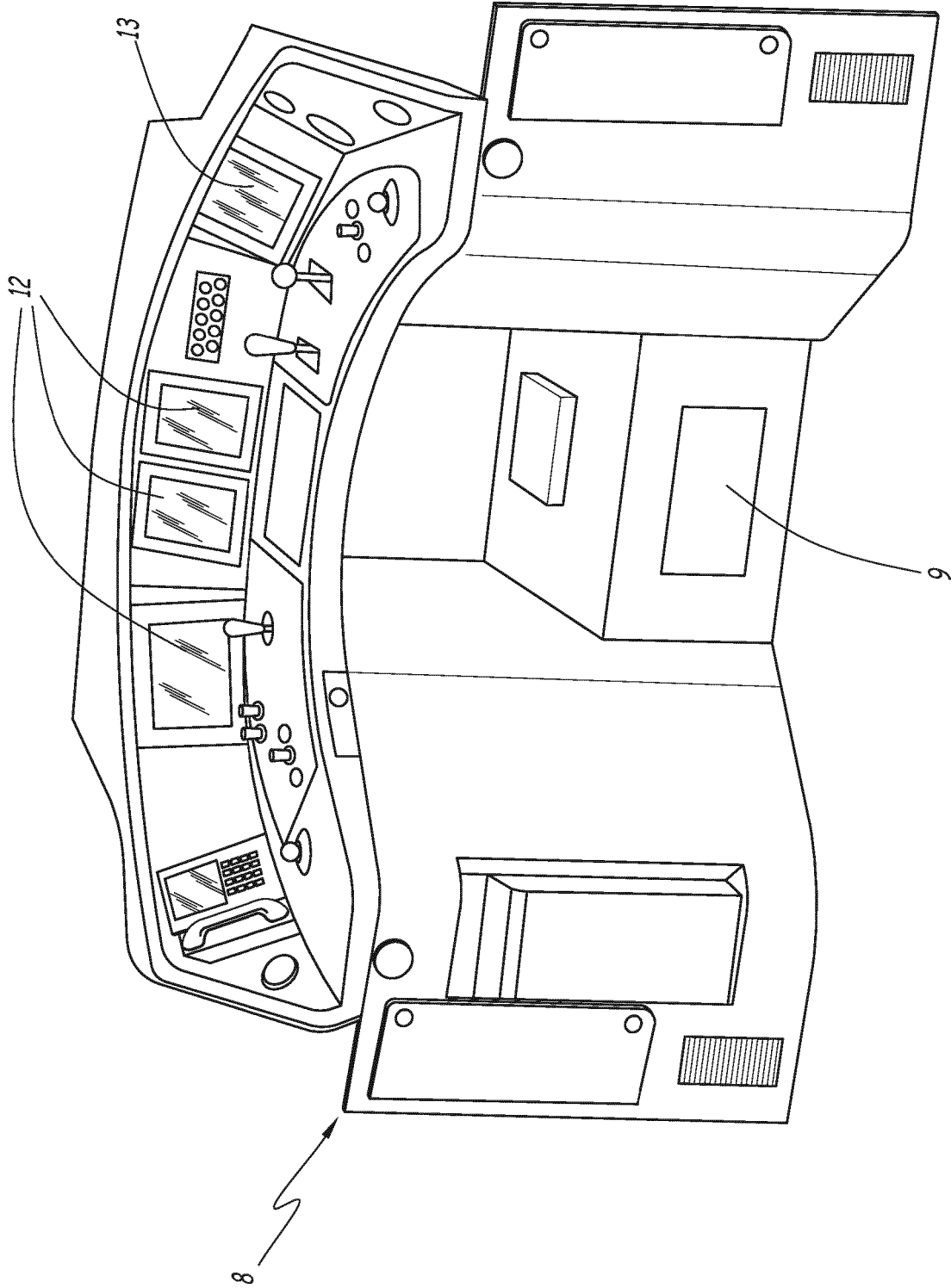


Fig.2

Fig.3



REFERENCES CITED IN THE DESCRIPTION

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