



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
26.09.2018 Bulletin 2018/39

(51) Int Cl.:
G07C 9/00 (2006.01)

(21) Application number: **17305311.7**

(22) Date of filing: **21.03.2017**

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA ME
Designated Validation States:
MA MD

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Remarks:

Amended claims in accordance with Rule 137(2)
EPC.

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(54) **DRIVER IDENTIFICATION SYSTEM FOR RAIL VEHICLES**

(57) 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 the cabin (1), said control unit (13) being arranged to automatically un-blocking the entry door (4) and to set cabin and driving parameters of the rail vehicle based on the driver data.

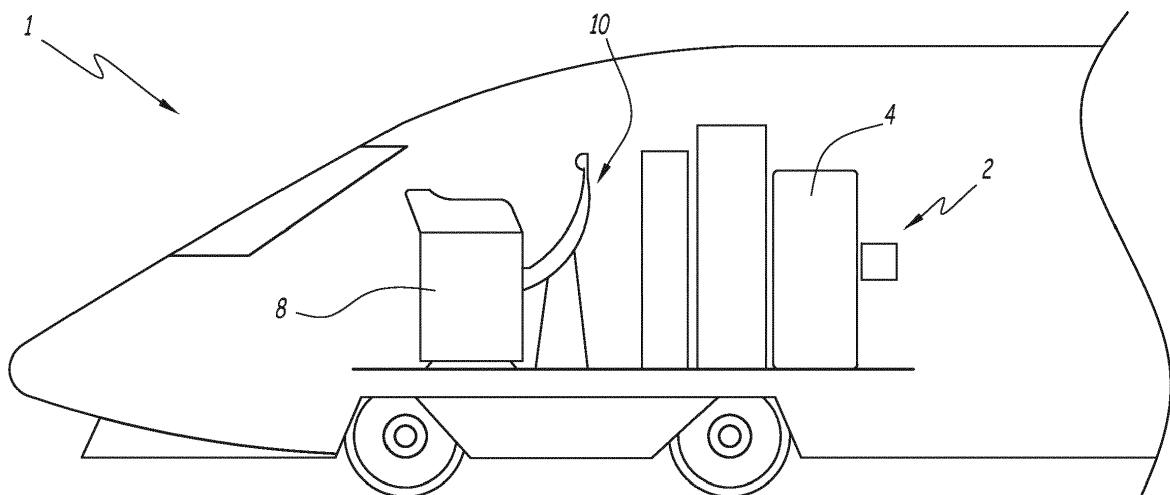


Fig.1

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] 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.

[0010] This and other objects are achieved by a driver identification system for rail vehicles having the characteristics defined in claim 1.

[0011] 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.

[0012] These technologies are nowadays largely employed and are based on very common devices which provide high security level in the data transmission.

[0013] The contactless reading let the driver improve the driving conditions by automating a plurality of operations, these steps being previously manually done.

[0014] 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.

[0015] 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.

[0016] 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.

[0017] 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.

[0018] 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.

[0019] With the system of the present invention additional data can be read, for example the number of train missions.

[0020] 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.

[0021] 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.

[0022] 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.

[0023] 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.

[0024] The identification code is associated, in a manner known per se, with driver data such as, for example, the height and weight of the driver, the used language,

the train mission number, etc.

[0025] 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.

[0026] 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.

[0027] 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.

[0028] 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 position of a chair 10 in the cabin 1, for example as a function of the height of the driver;
- setting of position (height) of a driver activity pedal 9, for example as a function of the height of the driver;
- 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;
- displaying driving parameters, such as for example a route assigned to the driver, on displays 12 of the driver desk 8.

[0029] 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;

[0030] 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.

[0031] 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 the cabin (1), 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.

2. The system of claim 1, wherein the driver data comprise the height of the driver, the weight of the driver, the used language, the train mission.

3. The system of claim 1 or 2, wherein the cabin (1) comprises a driver desk (8) arranged to host the control unit (13).

4. The system of claim 3, wherein the cabin and driving parameters comprise any of the following steps:

- switching on cabin lights and on the corridor to access to the cab;
- 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 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;
- setting the language of the console (8);
- displaying driving parameters on displays (12) of the driver desk (8).

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

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 - 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:

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

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wherein the contactless reading device (2) is further **characterized in that** it is powered by train batteries so as to be used both when the rail vehicle is powered and when the rail vehicle is not supplied.

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2. The system of claim 1, wherein the driver data comprise the height of the driver, the weight of the driver, the used language, the train mission.

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

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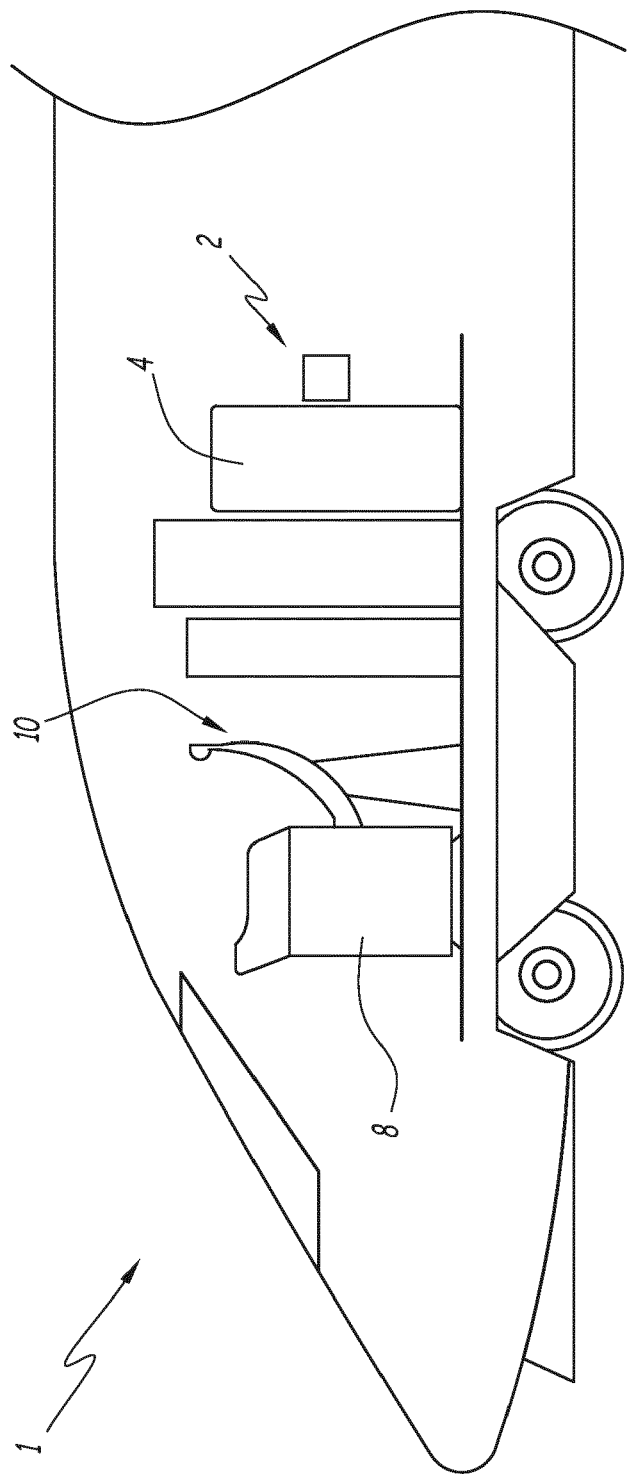


Fig. 1

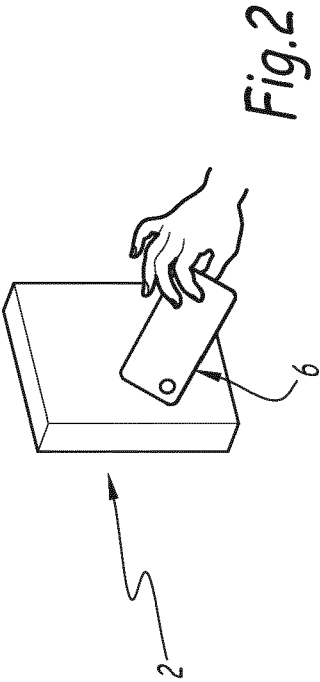
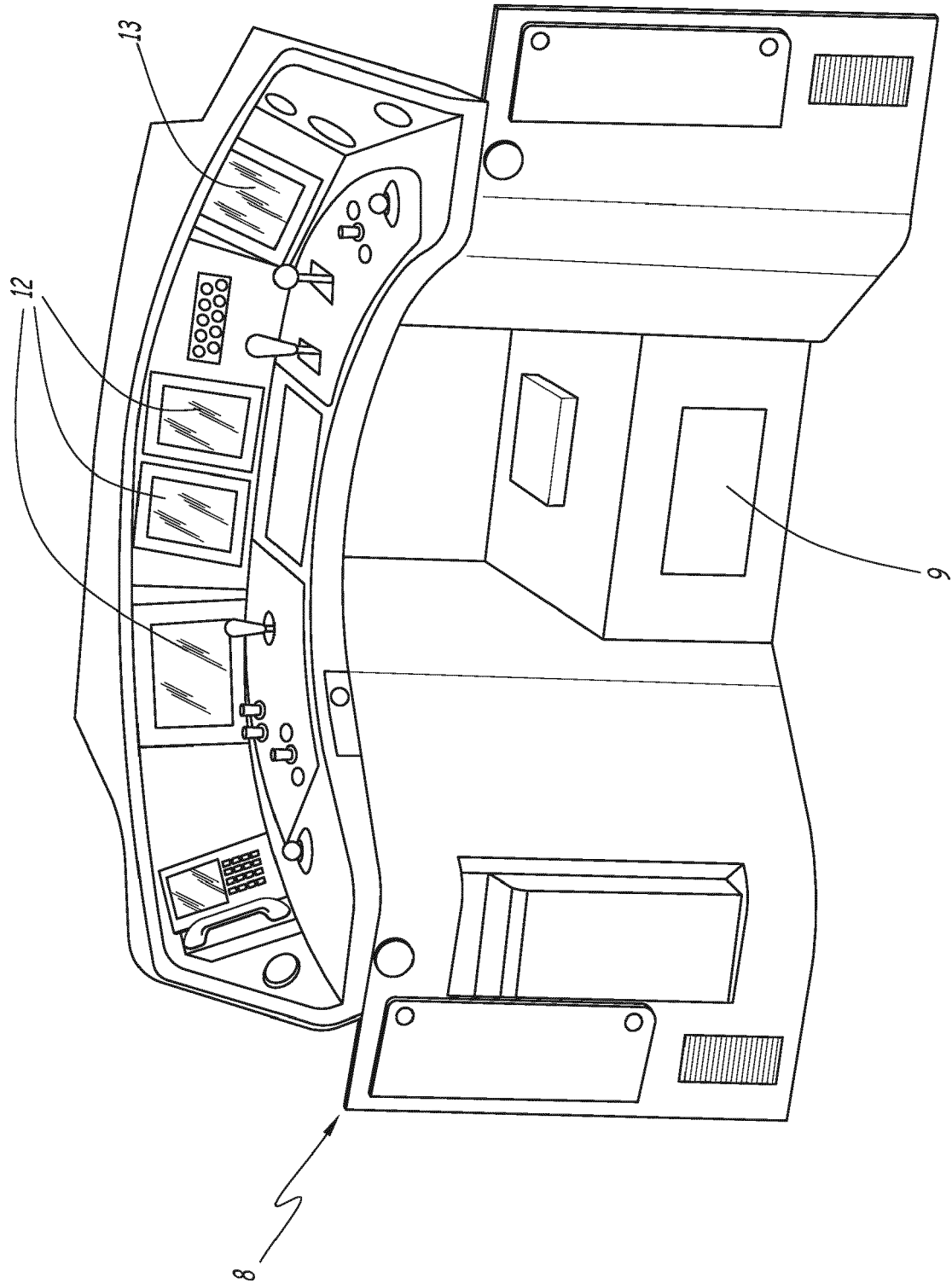


Fig. 2

Fig.3





EUROPEAN SEARCH REPORT

Application Number
EP 17 30 5311

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EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
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X	US 2014/309868 A1 (RICCI CHRISTOPHER P [US]) 16 October 2014 (2014-10-16) * abstract * * * paragraphs [0052], [0053] * * paragraph [0101] * * paragraph [0161] - paragraph [0251] * * paragraph [0415] - paragraph [0440] * * figures 1-30 *	1-5	INV. G07C9/00
X	US 8 626 357 B1 (LICKFELT BRIAN K [US]) 7 January 2014 (2014-01-07) * abstract * * * figures 1-3 * * column 2, line 54 - column 7, line 17 *	1-5	
X	US 6 505 780 B1 (YASSIN AMR F [US] ET AL) 14 January 2003 (2003-01-14) * abstract * * * column 2, line 61 - column 6, line 9 * * figures 1-5b *	1-5	
X	US 6 198 996 B1 (BERSTIS VIKTORS [US]) 6 March 2001 (2001-03-06) * abstract * * * column 1, line 45 - line 64 * * column 4, line 48 - column 6, line 42 * * claims 1-34 *	1-5	TECHNICAL FIELDS SEARCHED (IPC) G07C B60R G06F
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 21 September 2017	Examiner Pañeda Fernández, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 17 30 5311

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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