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(54) **A digital tachograph and a method therefore**

(57) The present invention relates to a digital tachograph comprising means for identifying a driver, and a user interface comprising processing means, input means for manual entry of driver activity data, and output means. The processing means are configured to enable

editing and saving driver activity data on a driver specific activity data storage means. Driver activity data saved regards activities of a driver identified by the driver identification means during a period of time being part of a non-driving time period.

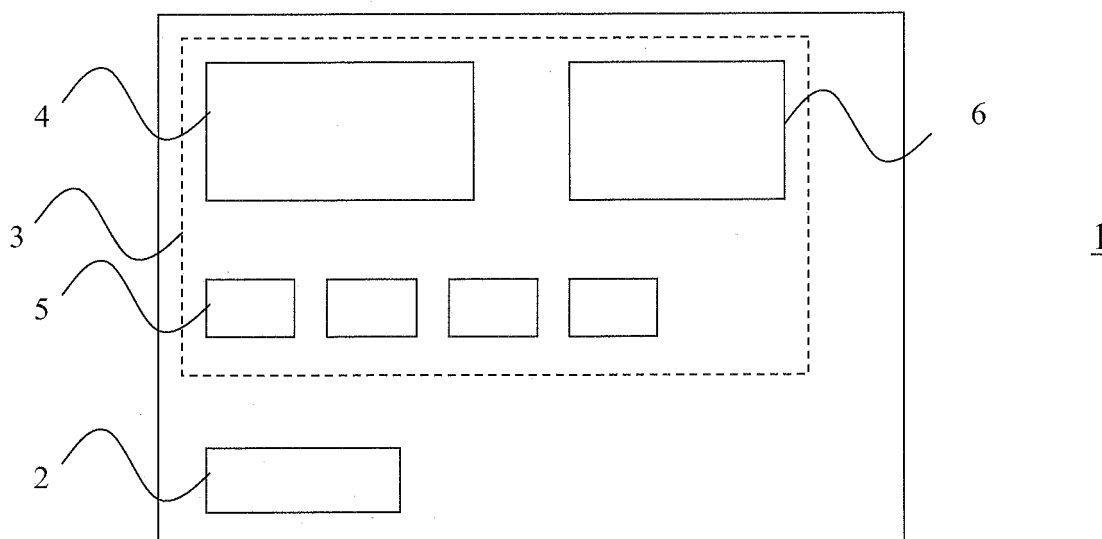


FIG. 1

Description

FIELD OF INVENTION

[0001] The present invention relates generally to digital tachographs, and particularly to a digital tachograph comprising a driver identifying means, and a user interface comprising processing means configured to enable manual entry of driver activity data.

BACKGROUND

[0002] Digital tachographs are like analogue tachographs used for gathering information relating to the usage of a vehicle, and to collection of driver activities, such as driving hours, distance traveled, start time, finish time, rest time, driver name, starting location and finishing location.

[0003] A digital tachograph greatly facilitates for a driver to register active usage of a vehicle, but non-driving time is still cumbersome to register for a driver. The non-driving time is in a digital tachograph equivalent to the time the driver has not been driving. In a tachograph using a smart card reader together with a smart card to identify a driver, non-driving time is the time when a driver's smart card has not been connected to a smart card reader of a digital tachograph, or a time period when the card has been connected to the smart card reader while the vehicle has been standing still. Thus, in such a tachograph a time period between respective moments in time when an identification card identifying a driver is taken out and inserted in an identifying means of a digital tachograph is one example of a non-driving time period.

[0004] Registrations of activities during non-driving time periods is manually entered via the user interface of a digital tachograph and thereafter confirmed and saved.

[0005] If a manual registration by mistake is done incorrectly, the driver is forced to either correct the error by simply handwriting on a paper log, or, if the mistake is observed prior to confirmation of manually entered driver activity data, to repeat the whole procedure of manual registration for the full non-driving time period.

SUMMARY OF THE INVENTION

[0006] An object of the present invention is to provide a tachograph and a method facilitating the procedure for registration and editing of driver activity data entered manually for a non-driving time period.

[0007] This object, among others, is according to the present invention attained by a digital tachograph and a method, respectively, as defined by the appended claims.

[0008] According to the present invention, a digital tachograph comprising driver identifying means, and a user interface with processing means, input means for manual entry of driver activity data and output means is

provided. The processing means are configured to enable editing and saving driver activity data on a driver specific driver activity data storage means. Data saved regards activities of a driver identified by the driver identification means during a period of time being a part of a non-driving time period. By enabling editing of a part of a non-driving time period, the time-consuming process of manually re-entering driver activity data for a full non-driving time period is avoided. Facilitating the process for manual entry and editing of driver activity data makes it easier for the driver to fully and completely present activities performed during a non-driving period.

[0009] According to an embodiment of the present invention, the processing means are further configured to display a chronologic time-line showing driver activity data including data entered manually for a non-driving period. The driver can thus check manually entered driver activity data, and any mistakes done in the registration can easily be identified and corrected.

[0010] According to an embodiment of the present invention, the processing means are further configured to display in said time-line type, start time and end time of a driver activity entered manually for each part of a non-driving time period. With such a configuration, an easy readable overview showing the non-driving period is achieved.

[0011] According to an embodiment of the present invention, the processing means are further configured to enable selection from said time-line of a time period being a part of a non-driving time period with manually entered driver activity data, for which part of period driver activity data is to be edited before confirmation.

[0012] For increased facilitation of the process for editing driver activity data, the output means are arranged to provide a read out to enable review before confirming entered driver activity data.

[0013] The output means is preferably any one of the following: a printer for printing of read out, a display for showing the read out, or a transmitter for transmitting the read out to an external device. Exemplary ways of transmitting the read out can be by wire connection, by radio communication or by infrared communication.

[0014] By preferably providing identifying means as a smart card reader or similar, easy identification of a driver is achieved by the use of a smart card. In a preferred embodiment, driver activity data concerning a specific driver is stored on a smart card. Thus, a smart card may be used both for identifying a driver and for achieving automatic driver information.

[0015] According to another aspect of the present invention, a method for manually editing and saving driver activity data regarding activities of a driver for a time period being a part of a non-driving time period is provided. The method comprises the steps of: identifying a driver, selecting a time period being a part of a non-driving time period for which part of period driver activity data is to be edited, receiving edited driver activity data by manual entry, providing a read out of said edited driver activity

data, reviewing, confirming and saving said edited driver activity data.

[0016] According to an embodiment of the present invention, the read out is provided on a display.

[0017] According to an embodiment of the present invention, the read out is transmitted to an external device.

[0018] According to an embodiment of the present invention, the read out is provided on a printer.

[0019] Further features and advantages of the present invention will be evident from the following detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] The present invention will become more fully understood from the detailed description of embodiments given below and the accompanying figures, which are given by way of illustration only, and thus, are not limitative of the present invention, wherein:

Fig. 1 schematically illustrates a digital tachograph according to the present invention.

Fig. 2 is a flow chart illustrating the process for manually entering and editing driver activity data.

Fig. 3a and 3b illustrates examples of a chronologic time-line showing type, start time and end time of driver activities entered manually for a non-driving time period.

DETAILED DESCRIPTION OF EMBODIMENTS

[0021] In the following description, for purpose of explanation and not limitation, specific details are set forth, such as particular techniques and applications in order to provide a thorough understanding of the present invention. However, it will be apparent for a person skilled in the art that the present invention may be practiced in other embodiments that depart from these specific details. In other instances, detailed description of well-known methods and apparatuses are omitted so as not to obscure the description of the present invention with unnecessary details.

[0022] An embodiment of a digital tachograph according to the present invention will now be described with reference to Figs. 1-3.

[0023] The digital tachograph 1 comprises means 2 for identifying a driver and a user interface 3 with processing means 4, input means 5 for manual entry of driver activity data and output means 6. The processing means 4 enables manual editing of driver activity data for non-driving periods. Means for identifying a driver can for example be a smart card reader used together with a smart card identifying a driver, but any other means enabling identification may be used, such as a SIM card in use for a mobile phone. Means for storing driver specific activity data can also be a smart card, and the same smart card

may be used for both purposes.

[0024] When a smart card is inserted into a smart card reader, the digital tachograph 1 requests registration of activities made by the driver since last connected to a digital tachograph by means of the smart card. Information regarding moment in time when last connected to a digital tachograph is retrieved from the smart card.

[0025] Manual entries that for instance may be required in addition to activities performed are information regarding country and region in which the driver has spent time since latest the smart card was connected to a digital tachograph, as well as the country and region in which the driver currently is. However, end country and region is preferably retrieved from the smart card, and start country and region is preferably retrieved from navigational equipment or similar.

[0026] When manual entry is ended a request is preferably given whether a read out of the manually entered driver activity data is wanted. If affirmative, a read out is preferably printed by an output means of the digital tachograph, such as a printer used for tachographic driver activity data of the digital tachograph or by display or other communication interface. Such read out may for example show start time and end time, or start time and duration, and type of activity of a driver activity entered manually for each part of a non-driving time period. There after, confirmation of entered driver activity data can be selected, or editing of the manually entered driver activity data can be selected.

[0027] If any error is found during review of the driver activity data registrations thus entered for a time period being a part of a non-driving time period, editing of driver activity data for such period of time is enabled by the processing means. When the driver needs to enter and edit manually entered driver activity data, the procedure is as follows.

[0028] As shown in Fig. 2, the driver identifies him/herself to a tachograph, for example by entering a smart card into a smart card reader in the tachograph. Activities performed during the last non-driving time period, in this example case the time period since the last time the driver was identified by a tachograph, are entered manually by the driver via the user interface.

[0029] When the driver has entered driver activity data for activities performed during the full non-driving period, entered driver activity data are reviewed. Review can be performed for example by printing a read out showing the period, or by review directly on a display on the tachograph. As shown in Fig. 3a and b, manually entered driver activity data can be shown graphically in a chronologic time-line, showing start time and end time of a driver activity entered manually for each part of a non-driving time period. Fig. 3a shows an example of a print-out of a full non-driving period, and Fig. 3b shows an example of a review view shown on a display. Each part of the non-driving time period, with a specific driver activity, can be selected for editing of manually entered driver activity data.

[0030] If the driver notes any deficiencies in the manually entered driver activity data during review, he may, by manual entry via the processing means, select a full non-driving time period, or a time period being a part of a non-driving time period, for which period manually entered driver activity data is to be edited, otherwise data can be confirmed and saved.

[0031] New driver activity data is thereafter received by manual entry via the input means. Thereafter, a read out of the manually edited driver activity data for the non-driving time period, or part of such period, can be done again for reviewing driver activity data before confirmation of the thus edited driver activity data. After confirmation driver activity data regarding the specific driver is saved and may, for legal reasons, not be changed.

[0032] The user interface preferably comprises a small display, due to space limitations in the vehicle the driver is using and also legislation requirements. Without such restrictions the user interface could e.g. include an external device, such as a large display, a mobile phone, a PDA or similar device.

[0033] The identifying means is preferably a smart card reader or similar, among other things due to legislation requirements. Without such restrictions the driver could e.g. be identified remotely through a mobile phone, a PDA, RFID, a Bluetooth connection, or similarly.

[0034] A further facilitation for manual entry of non-driving driver activity data is to give the user of the digital tachograph the possibility to enter whether local time or UTC (Coordinated Universal Time) should be used. By selecting local time the digital tachograph converts the time in the units of UTC. UTC can therefore be registered in the digital tachograph despite the user entering local times. In this way the user need not convert local times of activity to UTC, instead the digital tachograph will do it for the driver. Such an automatic conversion will also reduce the risk of faulty conversions.

[0035] It will be obvious that the present invention may be varied in a plurality of ways. Such variations are not to be regarded as departure from the scope of the present invention as defined by the appended claims. All such variations as would be obvious for a person skilled in the art are intended to be included within the scope of the present invention as defined by the appended claims.

Claims

1. A digital tachograph (1) comprising means for identifying a driver (2), and a user interface (3) comprising processing means (4), input means (5) for manual entry of driver activity data, and output means (6), **characterized in that** said processing means are configured to enable editing and saving, on a driver specific activity data storage means, driver activity data for a driver identified by the driver identification means during a period of time being part of a non-driving time period.

2. The digital tachograph according to claim 1, wherein said processing means (4) are further configured to display a chronologic time-line showing driver activity data including driver activity data entered manually for a non-driving period.

3. The digital tachograph according to claim 2, wherein said processing means are further configured to display in said time-line type, start time and end time of a driver activity entered manually for each part of a non-driving time period.

4. The digital tachograph according to claim 2 or 3, wherein said processing means (4) are further configured to enable selecting from said time-line a time period being a part of a non-driving time period with manually entered driver activity data, for which part of period driver activity data is to be edited before confirmation.

5. The digital tachograph according to any of claims 1-4, wherein said output means (6) are arranged to provide a read out to enable review before confirming entered driver activity data.

6. The digital tachograph according to claim 5, wherein said output means (6) is a display.

7. The digital tachograph according to claim 5, wherein said output means (6) is a transmitter for transmitting the read out to an external device.

8. The digital tachograph according to claim 5, wherein said output means (6) is a printer.

9. The digital tachograph according to any of claims 1-8, wherein said means for identifying a driver is a smart card reader into which a driver identifies him/herself by inserting a smart card.

10. The digital tachograph according to any of claims 1-9, wherein said driver specific activity data storage means is a smart card.

11. A method for use in a digital tachograph for manually entering, editing and saving driver activity data regarding activities of a driver for a time period being a non-driving time period, comprising the steps of:

identifying a driver;
receiving driver activity data by manual entry;
providing a read-out of such manually entered driver activity data,
reviewing said manually entered driver activity data;
selecting a time period being a part of a non-driving time period for which part manually entered driver activity data is to be edited;

receiving new driver activity data by manual entry;
providing a read out of edited driver activity data;
reviewing edited driver activity data;
confirming edited driver activity data, and
saving edited driver activity data on a driver specific activity data storage means.

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- 12.** The method according to claim 11, wherein said read out is provided on a display.

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- 13.** The method according to claim 11, wherein said read out is transmitted to an external device.

- 14.** The method according to claim 11, wherein said read out is provided on a printer.

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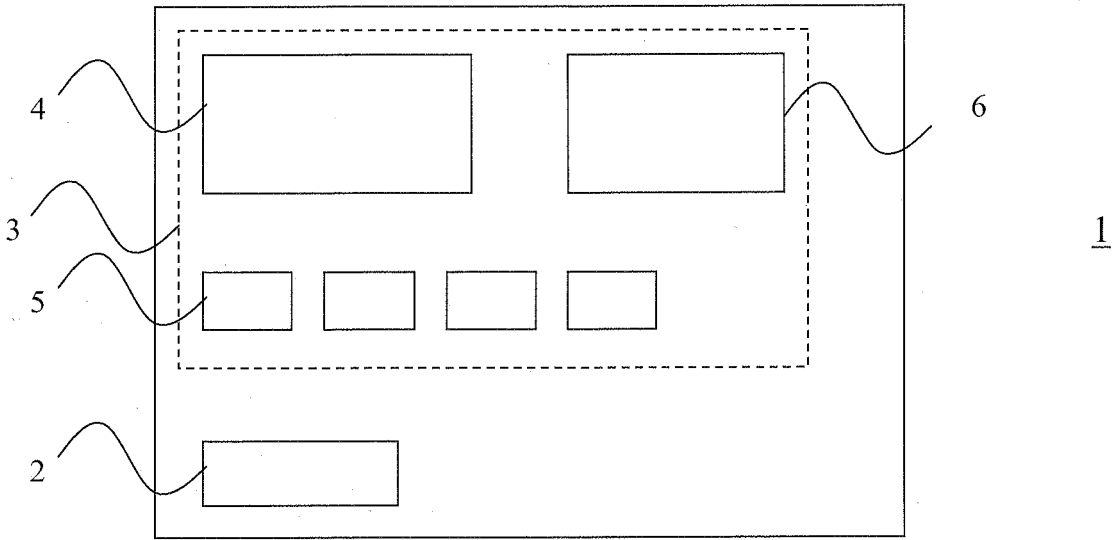


FIG. 1

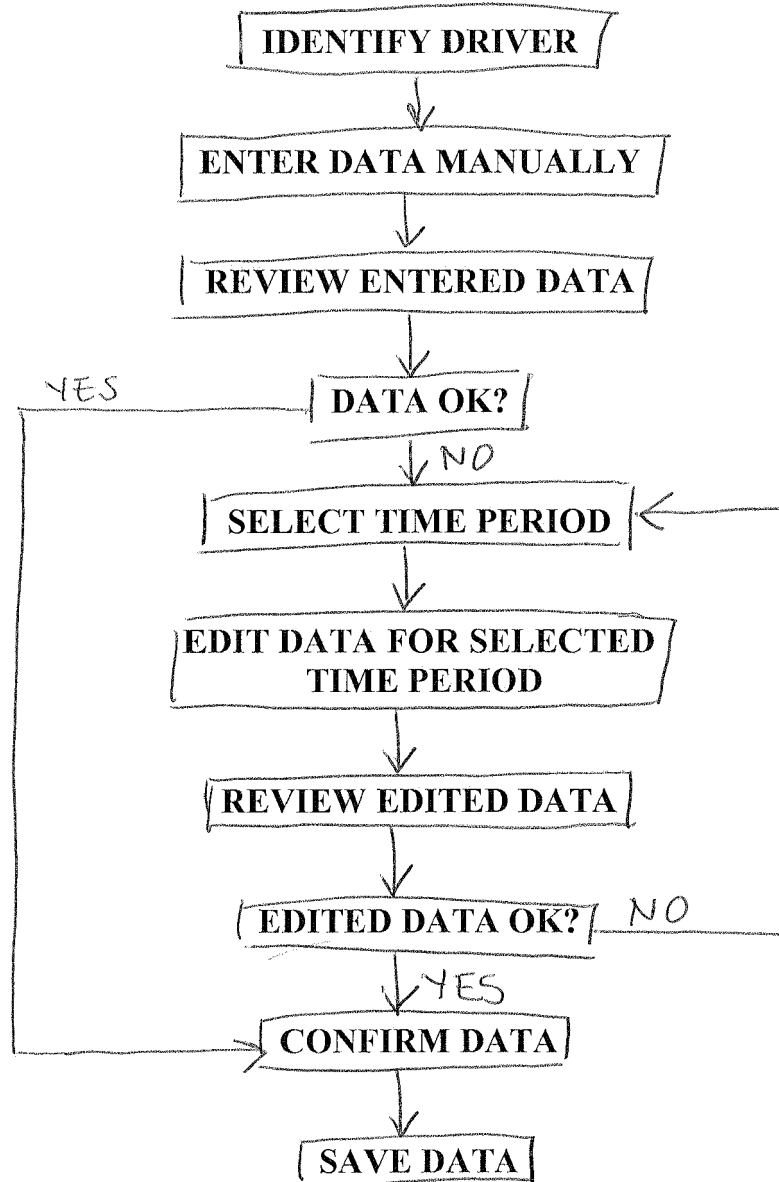


Fig. 2

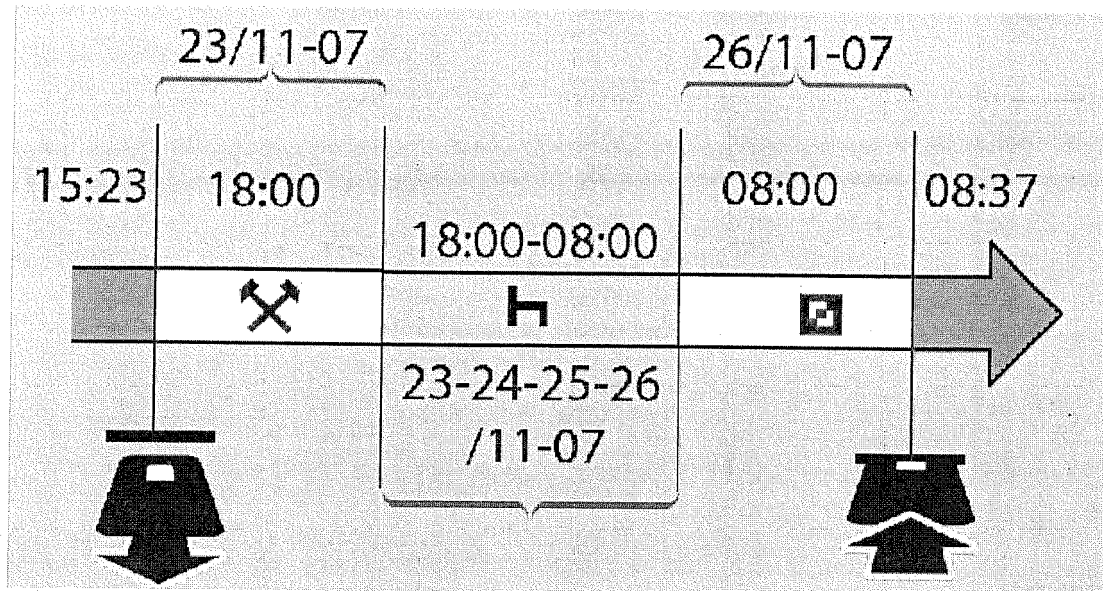
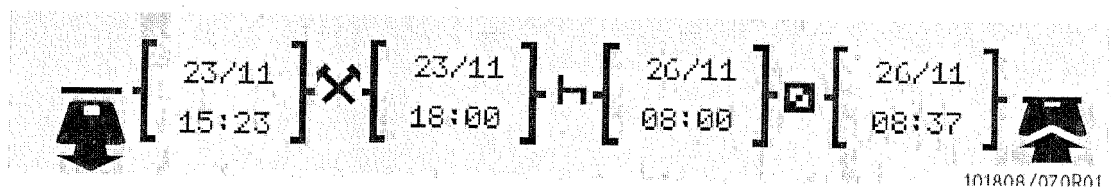


FIG. 3a



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FIG. 3b



EUROPEAN SEARCH REPORT

Application Number
EP 08 16 4824

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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