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- (54) **Title:** METHOD AND SYSTEM FOR ENTERING CHANGES OF DRIVER ACTIVITY IN TACHOGRAPHS OF VEHICLES

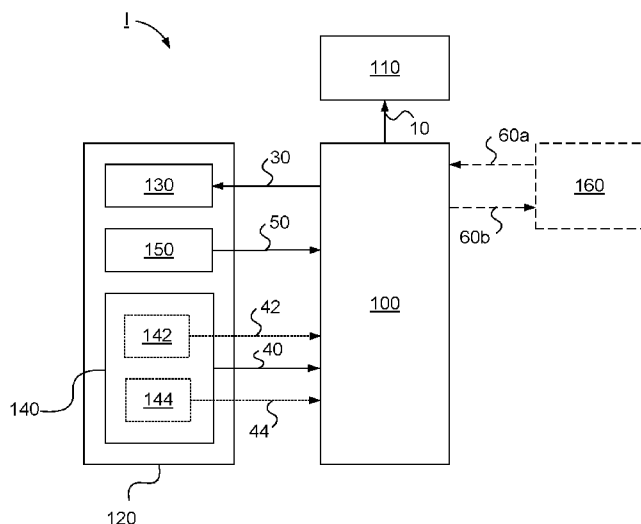


Fig. 2

(57) **Abstract:** The present invention relates to a method for entering changes of driver activity in a vehicle tachograph (110) comprising the step (S2) of responding to each activity change by registering said change in said tachograph (110), comprising the step (S1), at the time of change of driver activity, of using a remote unit (120) to draw the driver's attention to the need for registration of said activity change in the tachograph. The present invention relates also to a system for entering changes of driver activity in vehicle tachographs (110). The present invention relates also to a motor vehicle. The present invention also relates to a computer programme and a computer programme product.

METHOD AND SYSTEM FOR ENTERING CHANGES OF DRIVER ACTIVITY IN TACHOGRAPHS OF VEHICLES

TECHNICAL FIELD

- 5 The invention relates to a method for entering changes of driver activity in vehicle tachographs according to the preamble of claim 1. The invention relates to a system for entering changes of driver activity in vehicle tachographs according to the preamble of claim 5. The invention relates also to a motor vehicle. The invention also relates to a computer programme and
10 a computer programme product.

BACKGROUND

- Trucks used by professional drivers are provided with tachographs which record the driver's various activities such as driving, resting and work distinct from driving. How long the driver may drive continuously, the length of
15 required breaks etc. are governed by legislation. Data on these activities are saved in the tachograph and may be examined during inspections of the vehicle. Infringements attract heavy fines. The fact that the driver therefore needs to remember to register every change of activity represents a stress upon him/her. During driving with frequent stops it may be easy in some
20 situations to forget to register change of activity.

OBJECT OF THE INVENTION

- One object of the present invention is to propose a method for entering changes of driver activity in vehicle tachographs which facilitates the registration of the driver's activity changes.
- 25 One object of the present invention is to propose a system for entering changes of driver activity in vehicle tachographs which facilitates the registration of the driver's activity changes.

SUMMARY OF THE INVENTION

These and other objects indicated by the description set out below are achieved by a method, system, motor vehicle, computer programme and computer programme product of the kinds indicated in the introduction which

5 further present the features indicated in the characterising parts of the attached independent claims 1, 5, 9, 10 and 11. Preferred embodiments of the method and the system are defined in the attached dependent claims 2-4 and 6-8.

The invention achieves the objects with a method for entering changes of

10 driver activity in vehicle tachographs which comprises the step of responding to each activity change by registering said change in said tachograph, comprising the step, at the time of the driver activity change, of a remote unit drawing the driver's attention to the need for registration of said activity change in the tachograph.

15 The risk that the driver might forget to register activity changes is thus reduced, thereby facilitating his/her activity changes. The driver's stress factor is also reduced by being reminded of impending registration of activity changes. The remote unit may be any suitable unit such as a remote unit suited to the vehicle or a mobile telephone, e.g. a so-called smartphone.

20 In one embodiment the method comprises the step of registering said activity changes via said remote unit. Registration of activity changes is thus further facilitated in that the driver can effect their registration at a distance from the vehicle, e.g. when he/she takes a break and goes back to work distinct from driving.

25 In one embodiment the method comprises the step of activating said remote unit to draw the driver's attention to the need for registration in response to locking of the vehicle. Drawing the driver's attention to activity change upon locking of the vehicle is an easy way of reducing the risk of his/her forgetting

to register the activity change. The registration of the activity change may with advantage be effected by means of the remote unit.

In one embodiment the method comprises the step of activating said remote unit to draw the driver's attention to the need for registration in response to
5 his/her location relative to the vehicle's driving seat. Drawing the driver's attention to activity change when he/she is away from the driving seat is an easy way of reducing the risk of his/her forgetting to register the activity change. The identification of the driver's location relative to the driving seat may be by using any suitable position determination means such as GPS or
10 RFID (radio frequency identification). Said position determination means is preferably incorporated in the remote unit. In this context it is sufficient that the driver leaves the driving seat, which may entail leaving the vehicle but also the possibility of staying in the vehicle and intending to rest therein, e.g. on a bunk unit in the vehicle's cab. The registration of the activity change
15 may with advantage be effected by means of the remote unit.

The invention achieves the objects with a system for entering changes of driver activity in vehicle tachographs which comprises means for responding to each activity change by registering said change in said tachograph, comprising means for causing a remote unit, at the time of the driver activity
20 change, to draw the driver's attention to the need for registration of said activity change in the tachograph.

The risk that the driver might forget to register activity changes is thus reduced, thereby facilitating his/her activity changes. The driver's stress factor is also reduced by being reminded of impending registration of activity
25 changes. The remote unit may be any suitable unit such as a remote unit suited to the vehicle or a mobile telephone, e.g. a so-called smartphone.

In one embodiment, the system comprises means for registering said activity changes via said remote unit. Registration of activity changes is thus further facilitated in that the driver can effect their registration at a distance from the

vehicle, e.g. when he/she takes a break and goes back to work distinct from driving.

In one embodiment, the system comprises said means for activating said remote unit to draw the driver's attention to the need for registration lock

- 5 means for locking of the vehicle by said lock means. Drawing the driver's attention to activity change upon locking of the vehicle is an easy way of reducing the risk of his/her forgetting to register the activity change. The registration of the activity change may with advantage be effected by means of the remote unit.

- 10 The system comprises said means for activating said remote unit to draw the driver's attention to the need for registration driver position determination means for determining the driver's location relative to the vehicle's driving seat. The identification of the driver's location relative to the driving seat may be by using any suitable position determination means such as GPS or
- 15 RFID (radio frequency identification). Said position determination means is preferably incorporated in the remote unit. In this context it is sufficient that the driver leaves the driving seat, which may entail leaving the vehicle but also the possibility of staying in the vehicle and intending to rest therein, e.g. on a bunk unit in the vehicle's cab. The registration of the activity change
- 20 may with advantage be effected by means of the remote unit.

DESCRIPTION OF DRAWINGS

- The present invention will be better understood by reading the following detailed description in conjunction with the attached drawings, in which the same reference notations are used for similar items throughout the various
- 25 views,

Fig. 1 schematically illustrates a motor vehicle according to an embodiment of the present invention,

Fig. 2 schematically illustrates a system for entering changes of driver activity in vehicle tachographs according to an embodiment of the present invention,

Fig. 3 is a schematic block diagram of a method for entering changes of driver activity in vehicle tachographs according to an embodiment of the present invention, and

Fig. 4 schematically illustrates a computer according to an embodiment of the present invention.

DESCRIPTION OF EMBODIMENTS

The term “link” refers herein to a communication link which may be a physical connection, e.g. an opto-electronic communication line, or a non-physical connection such as a wireless connection, e.g. a radio link or microwave link.

Fig. 1 schematically illustrates a motor vehicle 1 according to an embodiment of the present invention. The vehicle exemplified is a heavy vehicle in the form of a utility vehicle such as a truck. The vehicle is provided with a system I for entering changes of driver activity in vehicle tachographs according to the present invention.

Fig. 2 schematically illustrates a system I for entering changes of driver activity in vehicle tachographs according to an embodiment of the present invention.

The system I comprises an electronic control unit 100 to direct the entering of changes of driver activity in the vehicle's tachograph 110.

The system I further comprises a tachograph 110 to register various activities of the vehicle's driver, e.g. driving, resting and work distinct from driving.

The system I comprises a remote unit 120 for drawing the driver's attention, at the time of each activity change, to the need for its registration in the tachograph.

The system I comprises activity change indication means 130 for drawing the driver's attention to the need for registration of activity changes in the tachograph 110. Said activity change indication means forms part of said remote unit 120. It may take the form of any suitable indicating means for
5 drawing the driver's attention to the need for registration of activity changes in the tachograph. In one embodiment said activity change indication means comprises a display unit for visually drawing the driver's attention by text/symbol message, flashing or the like and/or an alarm unit for drawing the driver's attention acoustically and/or a vibration unit for thus drawing his/her
10 attention.

The system I comprises activity change activation means 140 for activating said remote unit 120 to draw the driver's attention to the need for registration of activity changes in the tachograph 110. In one embodiment said remote unit comprises said activity change activation means 140.

15 Said activity change activation means 140 comprise in one variant a vehicle lock means 142 adapted to responding to locking of the vehicle by activating said remote unit 120 to draw the driver's attention to the need for registration of activity change in the tachograph. In one embodiment said remote unit comprises said vehicle lock means 142.

20 Said activity change activation means 140 comprises in one variant a driver position determination means 144 for determining the driver's location relative to the vehicle's driving seat and responding to occasions when his/her location differs from the driving seat by activating said remote unit 120 to draw the driver's attention to the need for registration of activity change in
25 the tachograph. The identification of the driver's location relative to the driving seat may be by using any suitable position determination means such as GPS or RFID (radio frequency identification). Said position determination means is preferably incorporated in the remote unit. In this context it is sufficient that the driver leaves the driving seat, which may entail leaving the
30 vehicle but also the possibility of staying in the vehicle and intending to rest

therein, e.g. on a bunk unit in the vehicle's cab. In one embodiment said remote unit comprises said driver position determination means 144.

The system I comprises activity change registration means 150 to register activity changes in the tachograph 110. Said remote unit 120 comprises said
5 activity change registration means, making it possible for registration of activity changes to be effected via said remote unit.

The electronic control unit 100 is signal-connected to said remote unit 120.

The electronic control unit 100 is signal-connected to said activity change indication means 130 via a link 30 which enables it to send to said activity
10 change indication means a signal which represents activity change indication data for drawing the driver's attention to the need for registration of activity change.

The electronic control unit 100 is signal-connected to said activity change activation means 140 via a link 40 which enables it to receive from said
15 activity change activation means a signal which represents activity change activation data for activating the remote unit 120 to draw the driver's attention to the need for registration of activity change.

The electronic control unit 100 is signal-connected to said lock means 142 via a link 42 which enables it to receive from said lock means a signal which
20 represents locking data for locking of the vehicle in order to activate the remote unit 120 to draw the driver's attention to the need for registration of activity change.

The electronic control unit 100 is signal-connected to said driver position determination means 144 via a link 44 which enables it to receive from said
25 driver position determination means a signal which represents driver position data on the driver's location relative to the vehicle's driving location in order to activate the remote unit 120 to draw the driver's attention to the need for registration of activity change.

The electronic control unit 100 is signal-connected to said activity change registration means 150 via a link 50 which enables it to receive from said activity change registration means a signal which represents activity change activation data for registering said activity change.

- 5 The electronic control unit 100 is signal-connected to said tachograph 110 via link 10 which enables it to send to said tachograph a signal which represents registration data for registering said activity change.

- 10 The electronic control unit 100 is adapted to processing said activity change activation data from the activity change indication means 130 and using them as a basis for sending activity change indication data to the activity change indication means of the remote unit 120 so that the driver's attention is drawn to imminent activity change.

- 15 The electronic control unit 100 is adapted in one variant to processing said locking data from said lock means 142 and using them as a basis for sending activity change indication data to the activity change indication means 130 of the remote unit 120 so that the driver's attention is drawn to imminent activity change.

- 20 In one variant, as previously mentioned, the lock means 142 forms part of the remote unit 120, making it possible for the driver to lock the vehicle by means of the remote unit, which thus has a vehicle key function. The locking via the activity change indication means 130 reminds the driver about activity change. In one variant said lock means is situated in a unit separate from the remote unit, e.g. a separate vehicle key.

- 25 In one variant the electronic control unit 100 is signal-connected to said lock mechanism 160 of the vehicle, i.e. the lock mechanism associated with vehicle doors, via a link 60a which enables it to receive from said lock mechanism a signal which represents locking data.

In one variant the electronic control unit 100 is signal-connected to said lock mechanism 160 of the vehicle via a link 60b which enables it to send to said lock mechanism a signal which represents locking data for locking of the vehicle.

- 5 In an undepicted variant, said lock mechanism is signal-connected directly to said lock means 142.

In one variant the electronic control unit is adapted to processing said driver position data from said driver position determination means 144 and using them as a basis for sending activity change activation data to the activity
10 change indication means 130 of the remote unit so that the driver's attention is drawn to imminent activity change.

The electronic control unit 100 is adapted to processing activity change activation data from the activity change registration means, i.e. instructions from the driver via the remote unit 120 to register activity change, whereupon
15 the electronic control unit is adapted to sending registration data to the tachograph 110 to register said activity change.

Fig. 3 is a schematic block diagram of a method for entering changes of driver activity in vehicle tachographs according to an embodiment of the present invention.

- 20 In one embodiment the method for entering changes of driver activity in vehicle tachographs comprises a first step S1 whereby at the time of change of activity by the driver a remote unit draws his/her attention to the need for registration of said activity change in the tachograph.

In one embodiment the method for entering changes of driver activity in
25 vehicle tachographs comprises a second step S2 whereby at the time of activity change said change is registered in said tachograph.

Figure 4 is a diagram of a version of a device 500. The control unit 100
[PAGE 10 LINE 23 ERRONEOUS "200"] described with reference to Figure

2 may in one version comprise the device 500. The device 500 comprises a non-volatile memory 520, a data processing unit 510 and a read/write memory 550. The non-volatile memory 520 has a first memory element 530 in which a computer programme, e.g. an operating system, is stored for
5 controlling the function of the device 500. The device 500 further comprises a bus controller, a serial communication port, I/O means, an A/D converter, a time and date input and transfer unit, an event counter and an interruption controller (not depicted). The non-volatile memory 520 has also a second memory element 540.

10 A proposed computer programme P comprises routines for entering changes of driver activity in vehicle tachograph according to the innovative method. The programme comprises routines for responding to changes in driver activity by causing a remote unit to draw the driver's attention to the need to register said activity change in the tachograph. The programme comprises
15 routines for registering said activity change in said tachograph at the time of said change. The programme may be stored in an executable form or in compressed form in a memory 560 and/or in a read/write memory 550.

Where the data processing unit 510 is described as performing a certain function, it means that it conducts a certain part of the programme stored in
20 the memory 560 or a certain part of the memory stored in the read/write memory 550.

The data processing device 510 can communicate with a data port 599 via a data bus 515. The non-volatile memory 520 is intended for communication with the data processing unit 510 via a data bus 512. The separate memory
25 560 is intended to communicate with the data processing unit via a data bus 511. The read/write memory 550 is arranged to communicate with the data processing unit via a data bus 514. The links for example associated with the control unit 100 may be connected to the data port 599.

- When data are received on the data port 599, they are stored temporarily in the second memory element 540. When input data received have been temporarily stored, the data processing unit 510 will be prepared to conduct code execution as described above. The signals received on the data port
- 5 may be used by the device 500 to cause a remote unit, at the time of change of driver activity, to draw the driver's attention to the need for registration of said activity change in the tachograph. The signals received on the data port may be used by the device 500 to respond to activity change by registering said change in said tachograph.
- 10 Parts of the methods herein described may be conducted by the device 500 by means of the data processing unit 510 which runs the programme stored in the memory 560 or the read/write memory 550. When the device 500 runs the programme, methods herein described are executed.
- 15 The above description of the preferred embodiments of the present invention is provided for illustrative and descriptive purposes. It is not intended to be exhaustive, nor to limit the invention to the variants described. Many modifications and variations will obviously suggest themselves to one skilled in the art. The embodiments have been chosen and described in order best
- 20 to explain the principles of the invention and their practical applications and thereby make it possible for one skilled in the art to understand the invention for different embodiments and with the various modifications appropriate to the intended use.

CLAIMS

1. A method for entering changes of driver activity in a vehicle tachograph (110) comprising the step (S2) of responding to activity change by registering said change in said tachograph (110), **characterised** by the step (S1), at the
5 time of change of driver activity, of using a remote unit (120) to draw the driver's attention to the need for registration of said activity change in the tachograph.
2. A method according to claim 1, comprising the step of registering said activity change via said remote unit (120).
- 10 3. A method according to claim 1 or 2, comprising the step of activating said remote unit (120) to draw the driver's attention to the need for registration in response to locking of the vehicle.
4. A method according to claim 1 or 2, comprising the step of activating said remote unit (120) to draw the driver's attention to the need for registration in
15 response to the driver's location relative to the vehicle's driving seat.
5. A system (I) for entering changes of driver activity in a vehicle tachograph (110) comprising means (150) for responding to activity change by registering said change in said tachograph (110), **characterised** by means (100, 130, 140) for using a remote unit (120) at the time of change of driver
20 activity to draw the driver's attention to the need for registration of said activity change in the tachograph (110).
6. A system according to claim 5, comprising means (100, 150) for registering said activity change via said remote unit (120).
7. A system according to claim 5 or 6, in which said means for activating
25 said remote unit (120) to draw the driver's attention to the need for registration comprise lock means (142) for locking of the vehicle.

8. A system according to claim 5 or 6, in which said means for activating said remote unit (120) to draw the driver's attention to the need for registration comprise driver position determination means (144) for determining the driver's location relative to the vehicle's driving seat.

5 9. A vehicle (1) provided with a system (I) according to any one of claims 5-8.

10. A computer programme (P) for entering changes of driver activity in a tachograph (110) of a vehicle (1), which programme comprises programme code which, when run by an electronic control unit (100) or another computer
10 (500) connected to the electronic control unit (100), enables the electronic control unit (100) to perform steps according to claims 1-4.

11. A computer programme product comprising a digital storage medium which stores the computer programme according to claim 10.

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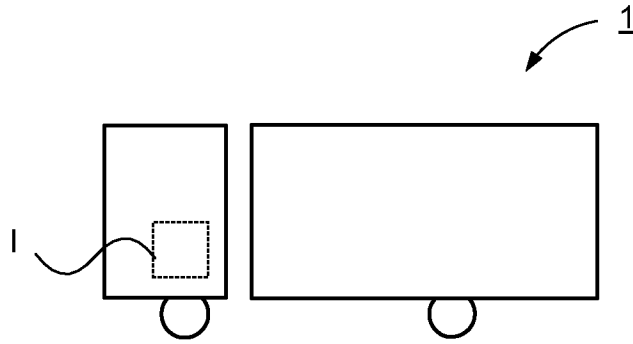


Fig. 1

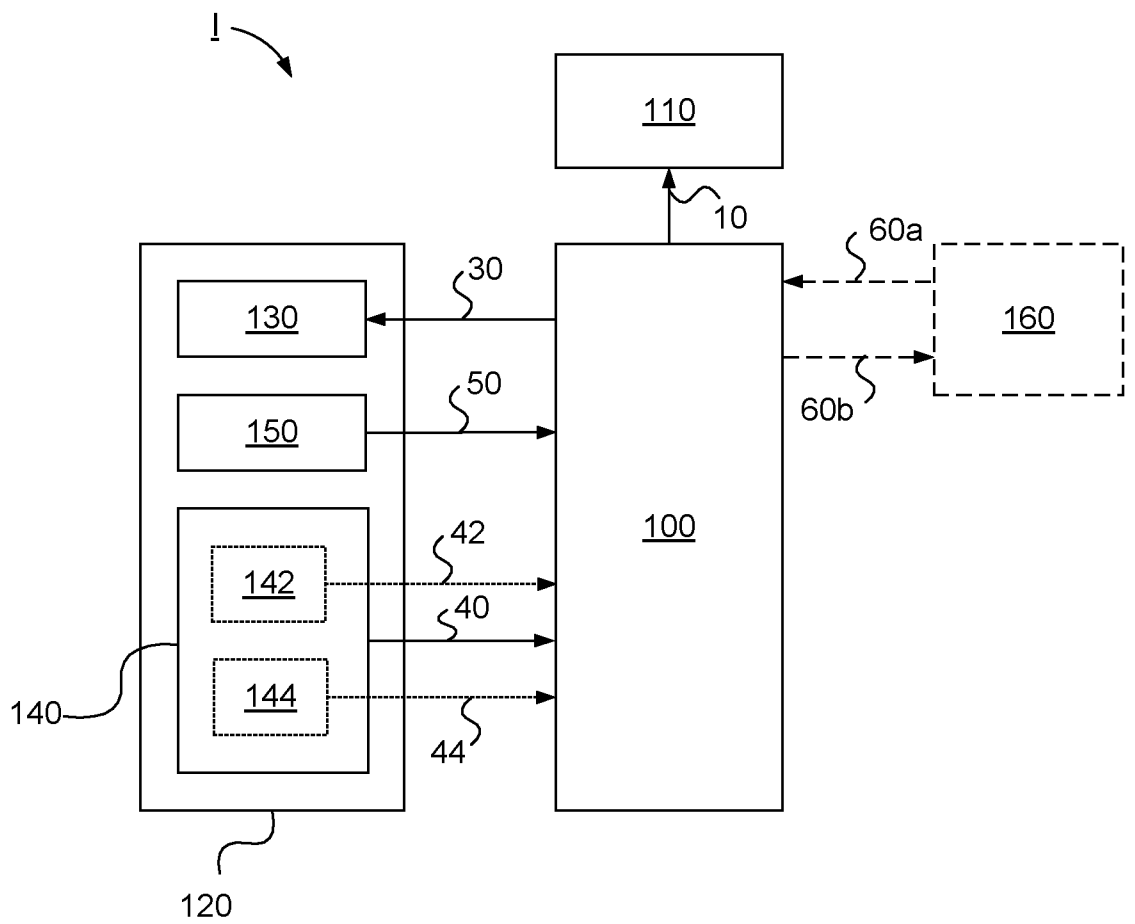


Fig. 2

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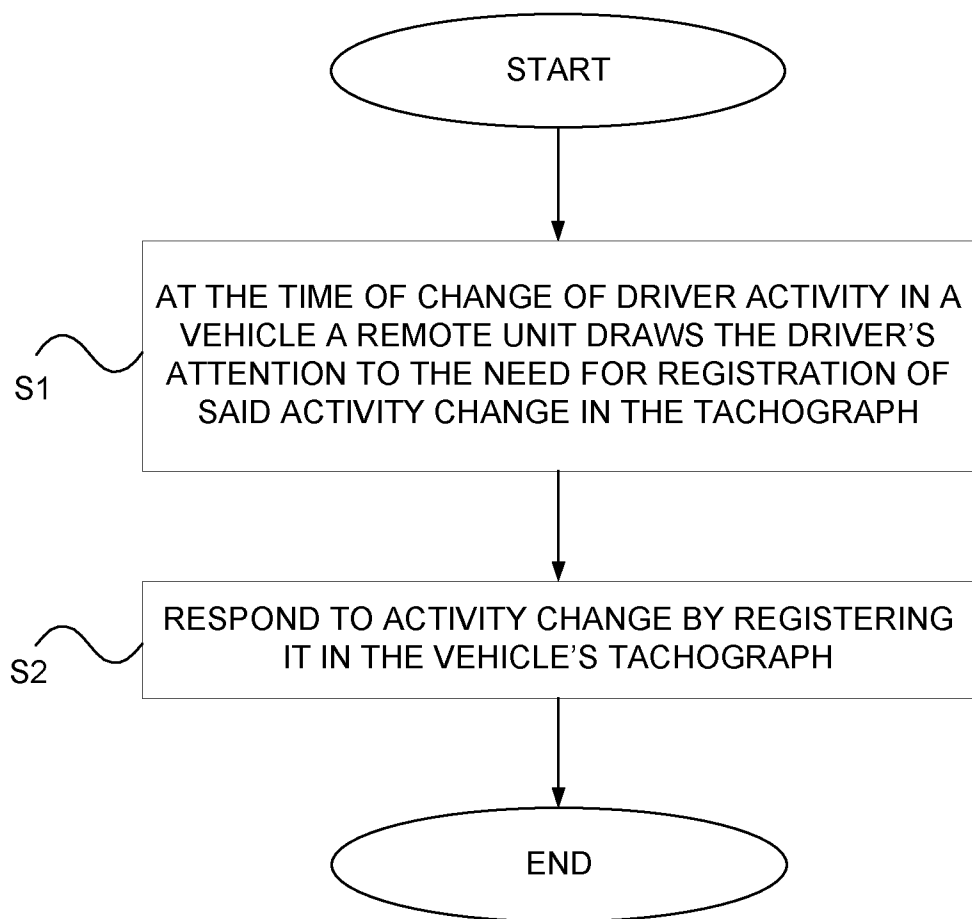


Fig. 3

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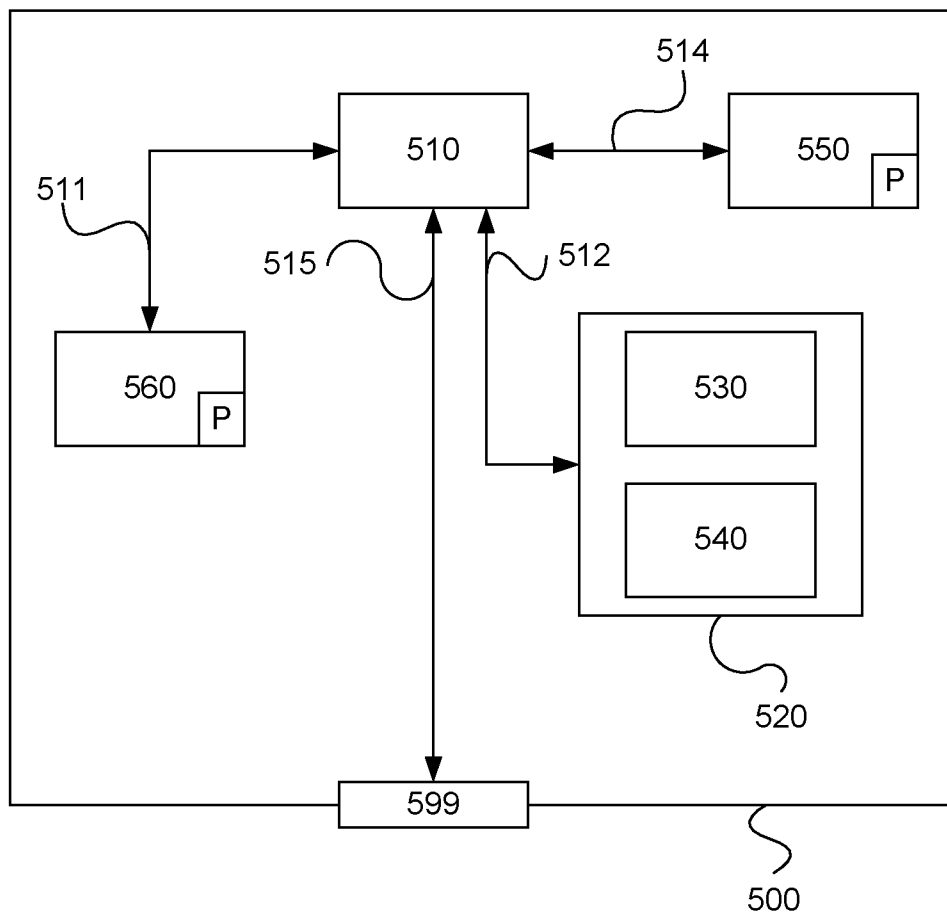


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE2013/051079

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

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)

IPC: G07C

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

SE, DK, FI, NO classes as above

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

EPO-Internal, PAJ, 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	DE 4129148 A1 (PEETZ PETER ET AL), 4 March 1993 (1993-03-04); abstract; figure 1 --	1-2, 5-6, 9-11
A	US 20120233081 A1 (HISHIKI HIROKAZU ET AL), 13 September 2012 (2012-09-13); abstract --	1-11
P, A	EP 2509049 A1 (SCANIA CV AB), 10 October 2012 (2012-10-10); abstract --	1-11
A	US 4805722 A1 (KEATING WILLIAM ET AL), 21 February 1989 (1989-02-21); abstract -- -----	1-11



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

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“O” document referring to an oral disclosure, use, exhibition or other means

“P” document published prior to the international filing date but later than the priority date claimed

“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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Continuation of: second sheet

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/SE2013/051079

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