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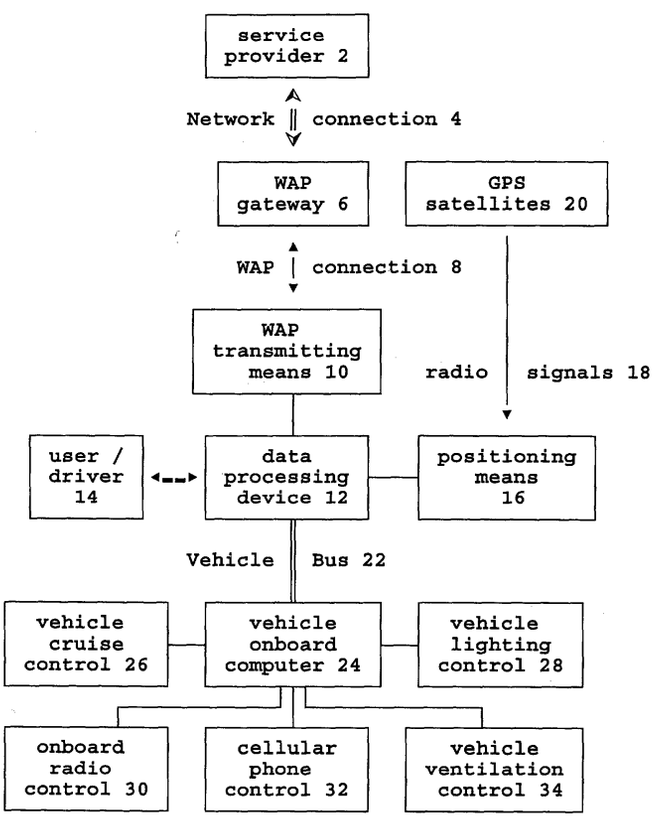
(54) Mobile terminal for use in a vehicle navigation system

(57) Method and apparatus for vehicle navigation for informing a driver about driving conditions ahead of the vehicle, comprising a positioning means (16) to locate the position of the vehicle, and a data processing device (12) adapted to process data and to interact with the driver (14), said data processing device (12) being connected to said positioning means (16), characterised by a wireless application protocol (WAP) transceiving means (10) connected to the data processing device (12) and adapted to exchange route related data with a service provider (2).

Fig. 2



EP 1 241 650 A1

Description

[0001] The present invention relates to mobile terminals for use in vehicle navigation systems. It also relates generally to navigation systems using a data transmission device to receive dynamic information concerning driving conditions ahead of the vehicle for informing the driver. In particular the invention relates to a mobile terminal using a positioning means to localise the vehicle position, which uses a wireless application protocol (WAP) for transmission of route related data to a service provider and receipt of information concerning driving conditions ahead of the vehicle. The invention relates further to a navigation system which is able to control vehicle applications automatically, according to route and topographic information of the navigation system.

[0002] The growing spread of navigation systems in vehicles in recent years indicates an increasing demand to simplify the operation of vehicles and release the driver. The total number of vehicles participating in the traffic has led to higher traffic density and to higher complexity in driving. To enhance the comfort of the driver during a trip, navigation systems have been devised to relieve the driver e.g. from the use of maps. So the driver using a navigation system does not need to stop the vehicle in order to read the maps, but can easily reach his destination without navigational stops.

[0003] Most navigation systems use an onboard computer, digitised maps, and a positioning system to support the driver with navigational problems. Such a system is described in german publication DE 43 00 927 A1. This document describes a navigation system, wherein the driver feeds an onboard computer system with a point of departure data and destination data, to generate a specific road book of the trip. The positioning system is based on a tracking system, using onboard sensors as an odometer. With reduced contact between the tires and the road e.g. under icy or dusty conditions the reliability of the positioning accuracy decreases. The navigation system of DE 43 00 927 A1 cannot locate the position of the vehicle reliably, and therefor can not relate the actual position of the vehicle to the information of the road book reliably. Being unable to locate its own position reliably, the navigation system can not transfer its position data to the service provider. The major advantage of a navigation system over a self written road book is the possibility to contact a service provider via mobile phone to receive dynamic data concerning the actual changes in the state of the whole route, such as traffic jams or the like. In the known system the service provider has no information about the position of the route the vehicle is actually in. Thus it is possible that the service provider transfers route related data about sections the vehicle has already passed. This is at least a waste of network resources.

[0004] The document DE 196 19 643 C1 describes an automobile having a navigation system, wherein the navigation system is used to detect if the vehicle is approaching a tunnel or other buildings over a route section, to change the settings of peripheral car applications such as light, ventilation and audio system. The car compares its position with the previously saved route condition data of this route point, to automatically change the setting of peripheral car applications, if it is necessary. This document discloses no possibility to update road data of the navigation system, and discloses no possibilities to contact a service provider to get dynamic data related to the route of the car. This automobile is not able to automatically control its primary applications, such as a cruise control or the like.

[0005] The main disadvantage of both above mentioned known systems is, that they cannot provide a reliable navigation operation. The navigation system of DE 43 00 927 A1 lacks a reliable positioning system, and the automobile of DE 196 19 643 C1 lacks actual road data, which decreases the reliability of the navigation. With an operation time up to ten years, even topographic data age and loose their reliability.

[0006] To increase the reliability of the navigation system and to enhance the comfort of the driver, there is a need for a mobile terminal in a navigation system with the ability of automatically updating its navigational data and the ability of depicting navigational information when the vehicle reaches a route section with changed driving code conditions.

[0007] To further enhance the comfort of the driver, there is a need for a navigation system with the ability of automatically adapting the driving state when the automobile reaches a route section with changed driving conditions, or changed highway code.

[0008] One object underlying the invention is to provide an apparatus and a method to increase the reliability of a mobile terminal.

[0009] A further object is to enhance the comfort of the driver by relieving him from the task to handle the vehicle application settings in accordance with driving conditions, or highway code.

[0010] Another object of the invention is to enhance the safety of the driver, because the driver can fully concentrate on the road and on the other vehicles, without even thinking of secondary vehicle applications.

[0011] This is achieved according to one aspect of the invention by a mobile terminal for informing a driver about driving conditions ahead of the vehicle, comprising a positioning means to locate the position of the vehicle, and a data processing device adapted to process data and to interact with the driver, and/or with the vehicle. The data processing device is connected to said positioning means and a transceiving means, which is adapted to exchange route related data with a service provider. Said transceiving means is preferably a Wireless Application Protocol (WAP) transceiver, a hypertext markup language (HTML) transceiver, a mobile information device profile (MIDP) transceiver or a hypertext transfer protocol (HTTP) transceiver or any other internet connecting protocol depending on the development

of available internet applications.

[0012] By using an internet protocol, e.g. WAP to communicate with the service provider, the navigation system uses an open standard for mobile terminals. This means that no proprietary solution is needed for meeting all requirements for the data exchange. The use of an open standard reduces the production cost of the transceiving means and/or the data processing device. By contacting a service provider via e.g. WAP, the navigation system can access actual data related to route conditions provided by a service provider. This enables the system to warn the driver of unknown and unforeseeable traffic situations ahead of him. These data can comprise topographic information and auxiliary information related to the highway code, the traffic or other conditions of the next route section. The navigation system can access both, the present position of the vehicle and the position of a characteristic route condition, and is therefore able to inform the driver about a change of driving conditions ahead of the vehicle. This may imply, for example the indication of an in-vehicle signpost, showing a speed limit or any other traffic signs, so that the driver can focus all his attention on the traffic. The indication can be optical or acoustical. The positioning means can be a Global Positioning System (GPS) receiver, a Global Navigation System (GloNaS) receiver, or any other conventional positioning device, like a cell phone network based positioning device.

[0013] According to a preferred embodiment of the invention, the data processing device comprises an interface and/or a connection to an onboard controller and/or an onboard computer of a vehicle.

[0014] By providing the data processing device with an interface, it may be applied to a vehicle with an onboard computer. With an interface from the data processing means to an onboard computer, the navigation system is able to change the operational state of vehicle applications, in accordance with data related to the driving conditions ahead of the vehicle. The navigation system is further adapted to execute changes in the driving state in accordance with highway code information, e.g. change the setting of a cruise control related to the speed limit information contained in the route information. Further, the navigation system can automatically control different vehicle applications such as light, radio, windows, ventilation systems. The navigation system can automatically turn the lights on, eg if the navigation system receives a card with a time a tunnel or a parking garage or the national territory of a state of Scandinavia will be entered. It is e.g. possible to receive a smog warning from the service provider for a route section, and automatically close all windows and set the ventilation system on circulation. A further advantage is that the data processing device, when connected to an onboard computer, can execute some kind of a self test by tracking the route data from the positioning system and from the on board computer by comparing the results.

[0015] The use of an interface has the additional advantage, that different onboard computer system of different vehicle manufacturers can be adapted using an adapter unit between the navigation system and the onboard computer.

[0016] In a preferred embodiment of the invention the WAP transceiving means is capable of receiving data from the positioning means and transmitting them to the service provider.

[0017] By receiving the position data from the positioning system and transferring it to the service provider, the driver only needs to supply the destination data, to enable the service provider to calculate a route. Another implementation of the position data transfer to the service provider is that the driver does not need to enter a destination. When the service provider knows the position and the direction of the vehicle he can transmit all traffic related information that refers to the an area ahead of the vehicle, whereby the navigation system displays only the information concerning the actual driving direction.

[0018] In another preferred embodiment of the invention, the data processing device is capable of executing a Wireless Markup Language (WML) script.

[0019] By using the WML script for the computing algorithm inside the data processing device, the amount of data sent and exchanged between the data processing device and the service provider can be reduced drastically.

[0020] Preferably, the data processing device comprises a user interface.

[0021] By using a user interface, the navigation system can easily be fed with data concerning the destination or preferences of the driver. A user input interface may comprise a touch screen display, an alphanumeric keypad or any other input device. Another possible interface is to transmit destination and preference data via SMS or WAP from a cellular phone. The output interface may be an optical or an acoustic display. In a basic version of the navigation system, any user interfaces may be totally avoided and the system provides just an automatic control of vehicle applications, such as automatic light and automatic speed limitation.

[0022] According to a preferred embodiment of the invention, the data processing device comprises means for reading, storing, and/or recalling navigational data.

[0023] This includes a classic static information onboard navigation system, that can reduce the amount of data to be exchanged. The data processing device can have a destination memory in addition, to store every route or destination that has been driven in the last year/month/week. Thereby the user can easily recall former destinations or routes. A further development of the navigation system can use the former destinations and time data to optimise the navigation and/or to automatically recognise the destination.

[0024] Preferably the WAP transceiving means is adapted to connect a service provider via a e.g. WAP-

gateway and via a network.

[0025] By using a WAP gateway or any other suitable gateway, the navigation system can easily access a service provider connected to a network such as the internet. The only requirement for a service provider is an internet access. The service provider can actively trace single vehicles via the WAP gateways to detect the average speed in special traffic sections, detect traffic jams or other street conditions. In some cases the behaviour of single vehicles may be affected by street conditions, such as traffic density, freezing rain, accidents and so on. Via internet, the service provider can enhance the reliability of the service by permanently updating the information concerning the highway condition. This is especially important for (variable) road works or for variable speed limits, which are dependent on traffic density.

[0026] According to another aspect of the invention, a vehicle is provided which has a navigation system adapted to change the setting of vehicle applications autonomously.

[0027] By connecting the navigation system directly or via an onboard computer or vehicle bus to vehicle applications, the navigation system can change the settings of car applications. The instruction on when, where and how to change the settings, is generated at a service provider, and transferred via WAP to the vehicle.

By using the navigation system to change the settings of a vehicle, the user / driver of the vehicle can be relieved from the task to set most vehicle applications according to the highway code. In the vehicle, the navigation system can directly be connected to vehicle applications. In the vehicle, the navigation system can be connected to the vehicle applications via an onboard computer. The onboard computer and the navigation system can be integrated functionally and spatially.

In the vehicle, the navigation system may comprise additional features, such as an onboard computer, vehicle radio with a foldable display, wherein the releasable vehicle radio touch screen display contains the WAP transceiving means, and combines every possible feature such as remote locking system, ignition switch, storage for individual seating/vehicle radio settings, preferences, destinations, watch, palmtop computer, digitised music player, digital camera and last but not least a UMTS-cellular phone.

[0028] According to yet another aspect of the invention, a method of operating a mobile terminal in a navigation system according to the present invention comprises the steps of obtaining the position data of the vehicle from the positioning means, transmitting the position data via an internet protocol to a service provider and receive route related data from the service provider via said internet protocol and supporting the navigation with the received/exchanged data.

[0029] By obtaining the position data of the vehicle from the positioning means, and transferring it to a service provider, the user (driver) does not need to feed a start position into the data processing device. By transferring the data exchange via e.g. WAP, an open standard transfer Protocol is used to transfer the data. However, other internet protocols may be used.

A WAP specific implementation is currently preferred, but similar solutions are envisaged using HTML (Internet protocol). Even the immediate communication of a mobile terminal with the Internet by hypertext transfer protocol (HTTP) is considered.

There are other solutions which involve the use of virtual machines operating with the mobile terminal using MIDP (Mobile Information Device Profile) or KJAVA available from SUN Microsystems.

[0030] Preferably the route related data are transferred as at least one wireless markup language (WML) deck of virtual cards generated from said service provider, wherein each card comprises the description of a relevant route point and its position.

[0031] By transferring a deck of cards with the description of relevant points, the data processing device is enabled to display the information contained in one card, if the data processing device detects the actual vehicle position is the same as indicated on the card. The position indicated on the card can be indicated in front of the position of the relevant point as seen from the driving direction, to enable the driver to react upon the changed conditions. The distance of the indicated position to the relevant point may be dependent on the route section, or of other parameters. The indicated position should at least be related to speed limits. The indicated position on the card could also be the actual position of the change in driving conditions, and the data processing device calculates the position of alert in dependence on the actual speed. The next relevant point can be displayed together with its actual distance.

[0032] Preferably the step of supporting the navigation comprises automatically downloading a script from the service provider and executing it automatically. The script is preferably a WML script

[0033] By using WML scripts as software to execute all needed commands in the navigation system, software updates can easily be made by downloading the data from the service provider. This for example allows for simultaneously using both, the forward and the on-point notation of the position of the relevant point.

[0034] Preferably supporting the navigation comprises the steps of retrieving the position and/or the driving direction of the vehicle, comparing the actual position with the position in the actual card, and executing a required change in the driving state automatically, when the actual position is the same as the position of the relevant point.

[0035] By waiting till the vehicle reaches a determined point ahead of the relevant point of the route, the drivers attention is drawn to the route point only once and only when its needed.

[0036] Advantageously the method further comprises the steps of, choosing an operation mode, defining the

preferences and/or the destination of the user, and transferring the user preferences and/or destination to the service provider via a WAP-gateway.

[0037] By choosing an operation mode, the driver can fully or partially activate the navigation system. The driver can choose between different operation modes e.g. a mode without an explicit input of the destination. In this mode, the navigation system requests the all relevant points contained in a predetermined area around the vehicle. This area can be dependent on the actual driving direction, driving area, and driving speed. By tracking the last route points, the system may recognise the actual driving state, such as searching for a parking place and can assist the driver by indicating the nearest parking space.

[0038] The possibility to enter the preferences of the driver allows the service provider to calculate e.g. the fastest, the shortest, the lowest energy consuming, or the lowest duty (toll) route. It also enables the service provider to calculate a route with a predetermined clearance in height.

The preferences may be determined automatically, by tracing the driving conditions of previous trips, to recognise frequently driven up destinations, to enable the system to automatically improve the navigation by automatically requesting the relevant points of the routes to the 5 most probable destinations. This can even be coupled with a date and time recognition, so that the data processing device or the service provider can detect structures in the behaviour of the driver. Another preference can be the information which automobile is used, because for different vehicles, different highway codes are valid, and why transfer all codes, and limitations, if only a small part of it is valid for the actual vehicle.

[0039] Preferably the method comprises the steps of clearing all stored information that refers to passed positions and downloading the next WML deck of cards with the description of the points of the next route segment.

[0040] By clearing all data of passed route points, the memory requirement of the navigation system is kept low, so that the system is cheap to manufacture and to maintain. Especially for the operation mode without specified destination, the navigation system can store more area points if the system can delete the not required points of its internal map.

[0041] Preferably the method further comprises the step of getting access to vehicle applications over an onboard controller and/or an onboard computer of a vehicle, via a vehicle bus.

[0042] The main advantage of this access to vehicle applications is that the navigation system can access relevant information referring to the driving state. Primary the data processing device can access the actual range according to the actual, average, or maximum fuel consumption. With this information the system may post a refuel request, including the navigation to a petrol station according to the preferences of the driver. Further the data processing device can transfer information about the actual speed, temperature or other environmental conditions to the service provider to enhance the quality of the cards. If e.g. a vehicle on a highway cruises at very low speed, this may indicate a traffic jam, and enabling the service provider to propose alternative routes to other service users. Further the information from the onboard computer concerning the activity of windshield wipers can indicate the weather situation, enabling the service provider to detect the weather situation on the street, and to inform the drivers of convertibles, with open tops to stop at the next parking place, to close their tops, before the rainy section of the route is reached.

[0043] Further information from the onboard computer can cause the system to post an emergency call, for the case, that the onboard computer detects an airbag inflation, or other danger indicating processes. If the system has sufficient impact resistence, this would definitively increase the safety of the driver and his passengers. In a second step the system may be integrated in ambulances, to automatically navigate the ambulance to the vehicle involved in an accident.

[0044] Advantageously the method further comprises the step of changing the settings of vehicle applications in accordance with the stored or received data.

[0045] This enables the system to autonomously change the settings of primary and secondary vehicle applications. Secondary vehicle applications such as the ventilation, windows, audio sources or the light system can be changed without primarily endangering the safety of the vehicle, the driver, or the passengers. The secondary vehicle applications are controlled by a central onboard computer or onboard control. The secondary functions can easily be controlled by the navigation system according to the received information in the cards via a vehicle bus to the onboard computer. The access to the board computer can include the access to primary, or safety relevant components such as the cruise control. By accessing the cruise control the driver can definitively prevent the violation of the highway code and consequently their effects. Additionally the driver may be warned from the navigation system to violate other highway code such as entering a one way street in the wrong direction and so on.

[0046] Preferably the method is characterised by repeating at least one of the steps periodically.

[0047] By periodically retrieving its position, the data processing device can track the route to exactly determine the point on which the data processing device should interact with the driver or the vehicle.

By periodically transferring data from the vehicle to the service provider, the service provider may track the vehicle, enabling the service provider to measure the average speed of the vehicle along the passed route section. This enables the service provider to determine the traffic density and the average speeds of road sections, enabling the service provider to enhance the calculation

of estimated times of arrivals. This enables the service provider to utilise every service using vehicle as an on-street sensor.

[0048] In the following, the invention will be described in detail by referring to the enclosed drawings in which

Figure 1 shows a message sequence chart depicting how the invention can be realised

Figure 2 shows a block diagram illustrating the structure of the navigation system.

[0049] Figure 1 illustrates the interactions between the user (driver), the navigation system, the WAP gateway, and the service provider.

In a first step (1) the user has the possibility to enter the "driving option" service.

In the following four steps (2-5) the selection of the driving option service is transferred to a service provider and a request for the preferences and destination is returned to the navigation system to be displayed to the user.

In the next step (6), the user enters (chooses) his preferences and the destination of the journey as soon as the service is selected. After this the user can start driving. It is to emphasise that the user will not be disturbed while driving.

Next (7-8), the preferences and destination of the user are sent to the service center.

Next (9-10), the service center generates a Wireless Markup Language (WML) deck with the description of the relevant points, and sends it back to the navigation system. Each point is described within one card, which contains a variable for describing this point (position, maximal speed, light etc...).

The next steps (11-14) download automatically (without any user interaction) a WML script from the service center for retrieving the position of the vehicle, for calculating the needed algorithm and for getting access to the vehicle application, such as cruise control via the vehicle bus.

After step 14, the navigation system will retrieve the position of the vehicle periodically, e.g. each second. The actual position is then compared with the position given in the actual card. As soon as the actual position is the same as the dictated position from the service center, the navigation system will execute the change required, such as reducing (or increasing) the cruise control value for vehicle velocity. If the information about the relevant points of the trip could not be inserted in one WML deck, the navigation system has to download the description of the point(s) for the next route segment automatically.

[0050] Figure 2 shows a block diagram illustrating the structure of the navigation system according to the present invention. It shows a service provider 2 connected via an internet connection 4 to a WAP gateway 6. The WAP gateway 6 transfers the Hypertext Markup Language (HTML) of the internet to a Wireless Markup Language (WML) of a cellular phone network, and vice versa. The WAP gateway 6 is connected via a WAP connection 8 of a cellular phone network to a WAP transceiving means 10 in a vehicle (not shown). The WAP transceiving means 10 is connected to a data processing device 12. The data processing device 12 is connected via a user interface (not shown) to the user / driver 14. The user interface is required for the input of the destination and the preferences of the user / driver 14, and for the output of the navigational instructions. The data processing device 12 is connected to a positioning means 16, for receiving radio signals 18 from global positioning satellites 20, to locate the position of the vehicle. The data processing device 12 is also connected via a vehicle bus 22 to a vehicle onboard computer 24. The onboard computer 24 is connected do different vehicle applications such as vehicle cruise control 26, vehicle lighting control 28, onboard radio control 30, cellular phone control 32, and vehicle ventilation control 34.

During operation, the user 14 feeds the data processing device 12 with information about the destination and preferences of the intended trip.

Meanwhile the data processing device 12 requests the actual vehicle position from the positioning means 16. The data processing device 12 transmits the actual vehicle position, the destination and the preferences to the service provider 2. The service provider calculates the route according to the present position of the vehicle and the destination and the preferences of the user 14. Thereafter the service provider 2 generates a number of cards with relevant information of the route. Each card contains a position information and information according to route conditions such as speed limits, tunnels or other information, of different road points. These cards are transmitted as a deck to the data processing device 12. The data processing device 12 requests in predetermined intervals the actual vehicle position from the positioning means 16. The intervals may be constant time intervals, or can be depending on the actual speed or other parameters. These actual vehicle positions are compared with the position information in the cards.

Because both, the position on the cards and of the positioning means 16 have discrete values, the data processing device 12 needs an algorithm to indicate or execute the card information if and when the vehicle approaches the indicated position. When the data processing device 12 recognises the actual position the same as indicated in the card, the data processing device 12 displays an instruction to the driver, or issues a command to the vehicle onboard computer 24 via the vehicle bus 22. The vehicle onboard computer subsequently changes the setting of at least on vehicle application. This can result in an autonomous activation of lights, ventilation, audio system, cruise control, warning flasher, or other special features. So the navigation system can meet all the requirements dictated from the Highway code, so that the user / driver only has to handle the steering wheel and the direction indicators and follow the instructions of the navigation system.

[0051] This application presents the implementation and embodiments of the present invention with the help of examples. It will be appreciated by a person skilled in the art that the present invention is not restricted to details of the embodiments presented above, and that the invention can also be implemented in other form without deviating from the characteristics of the invention. The embodiments presented above should be considered illustrative, but not restricting. Thus the possibilities of implementing and using the invention are only restricted by the enclosed claims. Consequently the various options of implementing the invention as determined by the claims, including the equivalent implementations, also belong to the scope of the invention.

Claims

1. Mobile terminal for receiving information about driving conditions ahead of a vehicle, comprising a positioning means (16) to locate the position of the vehicle, and a data processing device (12) adapted to process data and to interact with the driver, said data processing device (12) being connected to said positioning means (16), **characterised by** a transceiving means (10) connected to said data processing device (12) and adapted to exchange route related data with a service provider (2).

2. Mobile terminal according to claim 1, wherein said transceiving means is a wireless application protocol (WAP) transceiver or a hypertext markup language (HTML) transceiver.

3. Mobile terminal of claim 1, **characterised in that** said data processing device (12) comprises an interface and/or a connection to an onboard controller and/or an onboard computer (24) of a vehicle.

4. Mobile terminal according to one of the preceding claims, wherein said transceiving means (10) is capable of receiving data from said positioning means (16) and transmitting them to said service provider (2).

5. Mobile terminal according to any of claims 1 to 4, wherein said data processing device (12) is capable of executing a wireless markup language (WML) script.

6. Mobile terminal according to any of claims 1 to 5, **characterised in that** said data processing device (12) comprises a user interface.

7. Mobile terminal according to any of claims 1 to 5, **characterised in that** said data processing device (12) comprises means for reading, storing, and/or recalling navigational data.

8. Mobile terminal according to any of claims 1 to 7, **characterised in that** said transceiving means (10) is adapted to connect said service provider (12) via a gateway (6) and via a network (4).

9. Vehicle adapted to automatically change the settings of vehicle applications, **characterised by** a mobile terminal as claimed in one of claims 1 to 8, connected to said vehicle applications to change the setting of said vehicle applications automatically.

10. Method of operation of a mobile terminal for executing a navigation operation as claimed in any one of claims 1 to 8, **characterised by** the steps of:

    - Obtain position data from a positioning means (16);
    - Transmit said position data to a service provider (2) via an internet protocol,
    - Receive route related data from said service provider (2) via said internet protocol;
    - Support the navigation application with the received/exchanged data.

11. Method of claim 10, wherein said internet protocol is a wireless application protocol (WAP) and said route related data are transferred as a wireless markup language (WML) deck of virtual cards generated from said service provider (2), wherein each card comprises a description of a relevant route point.

12. Method of claim 10, wherein said internet protocol is a hypertext transfer protocol (HTTP) or a mobile information device profile (MIDP) protocol

13. Method of any of claims 11 or 12, further comprising the steps of:

    - Download a script automatically from said service provider (2);
    - Execute said script.

14. Method of claim 11, further comprising the steps of:

    - Retrieve the position and/or the driving direction of the vehicle;
    - Compare the actual position with a position data in the actual card;
    - Execute a required change in the driving state automatically, when the actual position is the same as the position of the relevant route point.

15. Method according to any of claims 10 to 14, further comprising the steps of:

    - Choose an operation mode;

- Define preferences and/or destination of a user (14);
- Transfer said user preferences and/or destination to said service provider (2) via a gateway (6).

16. Method according to any of claims 10 to 15, further comprising the steps of:

- Clear stored information referring to passed positions;
- Download the next WML deck containing a description of relevant route points of the next route segment.

17. Method according to any of claims 10 to 16, further comprising the step of:

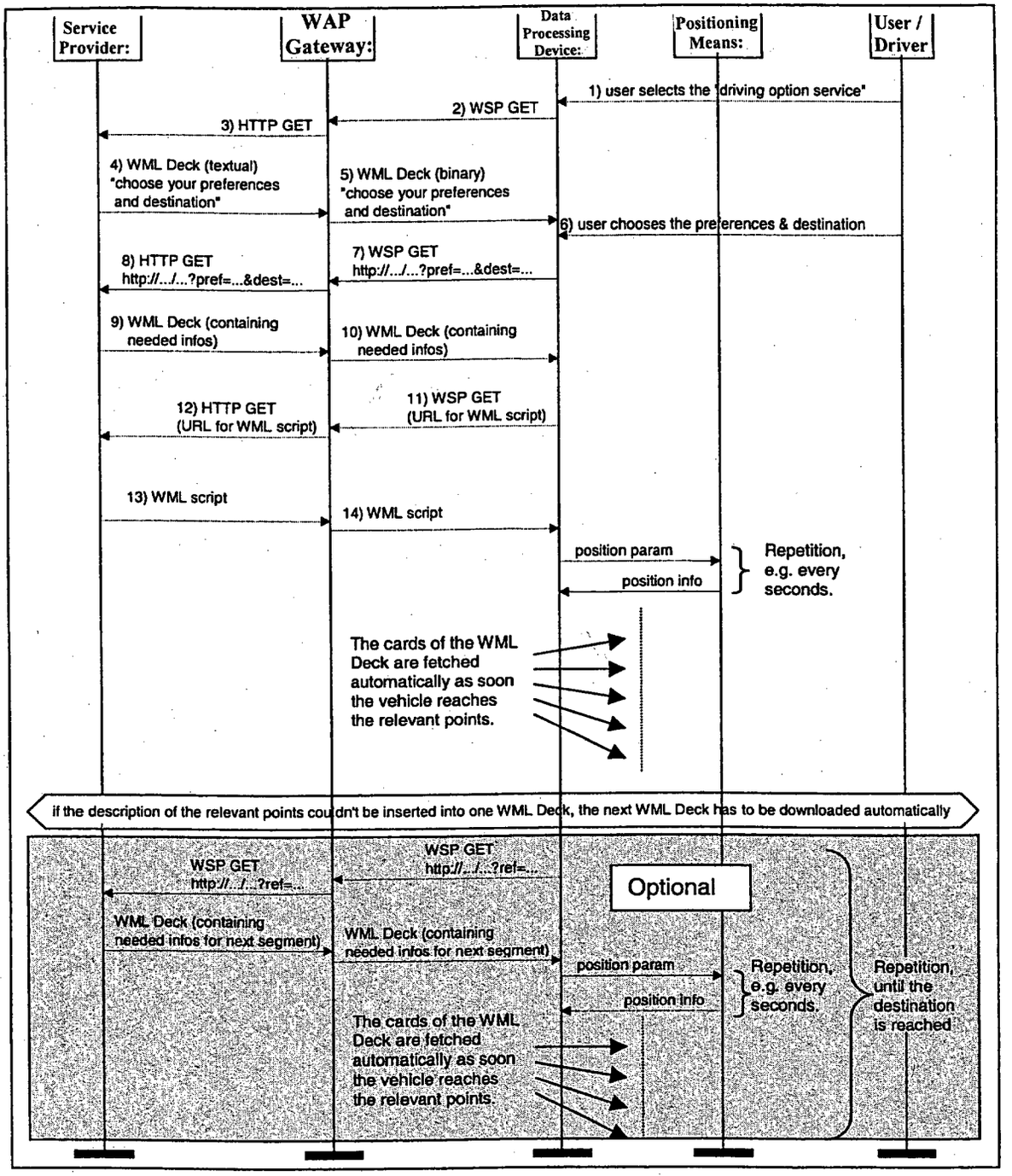
- Get access to car applications over an onboard control and/or an onboard computer (24) of a vehicle, via a vehicle bus (22).

18. Method according to any of claims 10 to 17, further comprising the step of:

- Change the settings of vehicle applications in accordance with the stored or received data.

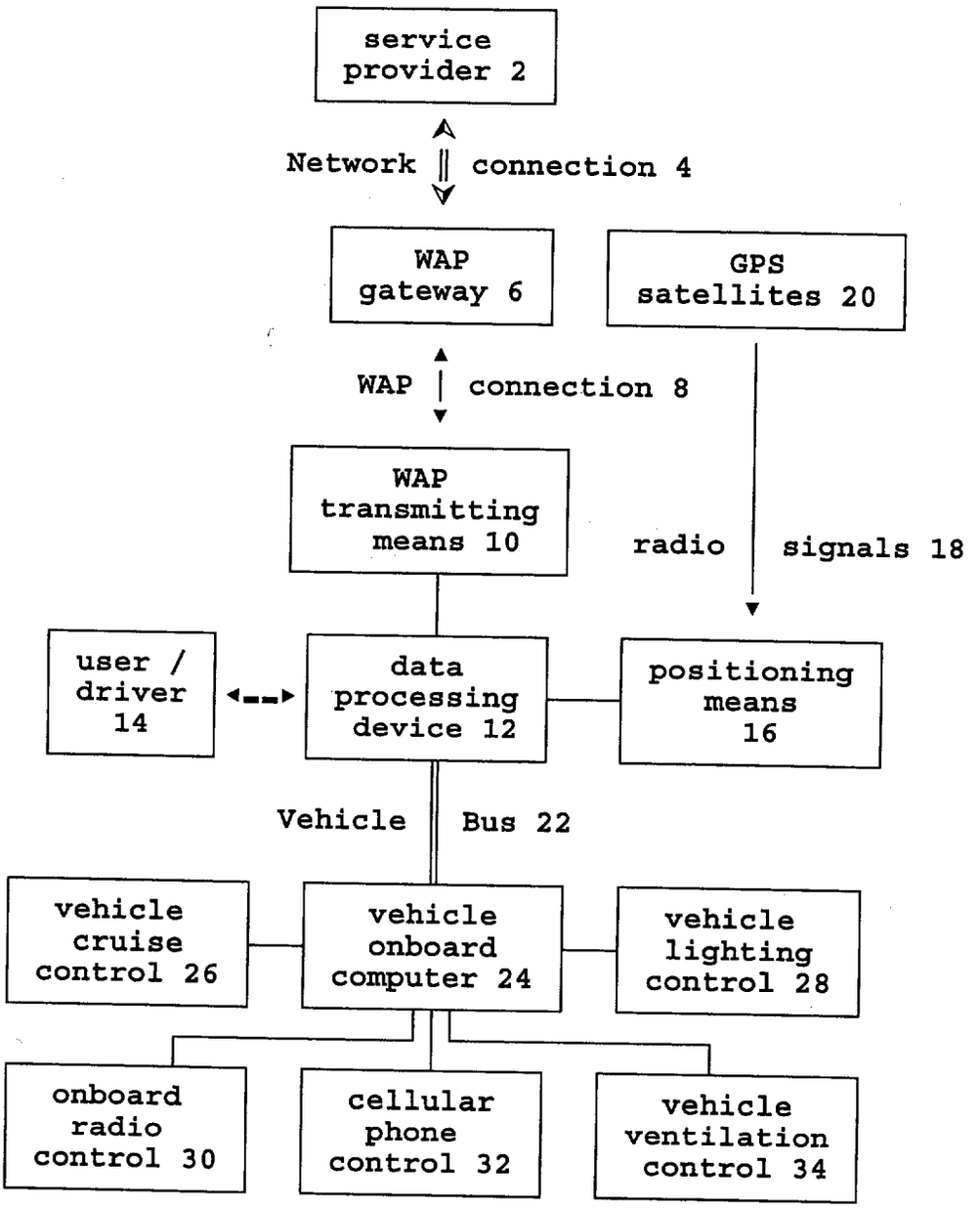
19. Method according to any one of claims 10 to 18, **characterised by** repeating at least one of the steps periodically.

Fig. 1



Message Sequence Chart for the implementation of the invention.

Fig. 2


service provider 2
Network connection 4
WAP gateway 6
GPS satellites 20
WAP connection 8
WAP transmitting means 10
radio signals 18
user / driver 14
data processing device 12
positioning means 16
Vehicle Bus 22
vehicle cruise control 26
vehicle onboard computer 24
vehicle lighting control 28
onboard radio control 30
cellular phone control 32
vehicle ventilation control 34

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 10 6581

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	EP 1 079 354 A (NOKIA MOBILE PHONES LTD) 28 February 2001 (2001-02-28) * abstract; figures 2,3 * * page 4, line 6 - page 8, line 39 *	1-13,15, 19	G08G1/0968 G08G1/127
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