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(56) Documents Cited:
GB 2376297 A GB 2360588 A
WO 1997/031241 A1 DE 019744419 A1
US 5760742 A US 20070288163 A1
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(54) Title of the Invention: **Force route management**
Abstract Title: **Providing a forced navigation route via a portable navigation device**

(57) A system is provided wherein a portable navigation device (PND) is forced to present a route programmed by a user to ensure that the route displayed by the PND is absolute, and cannot be changed by the PND once programmed. This allows a route to be followed to ensure that the most efficient route based on cost can be used repeatedly. The system also provides a two way messaging service that can be used without the need for mobile phones, or any device other than the PND. The PND can be remotely programmed, and new route information can be downloaded from a remote server. The system allows the full traceability of the journeys followed, including general information of the vehicle speed, distance, and stoppages. The system is particularly suited for use with gridding vehicles, ensuring that an exact route is followed, and that no routes are missed, giving rise to routes that could be potentially unsafe.

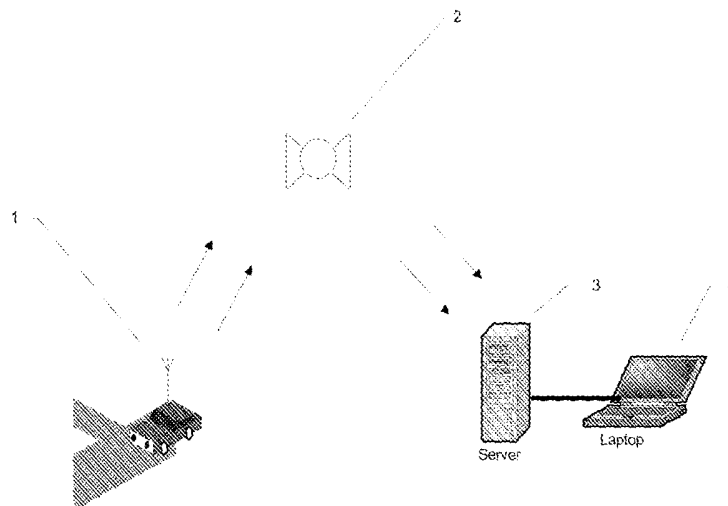


Figure 1 System Setup

GB 2469086 A continuation

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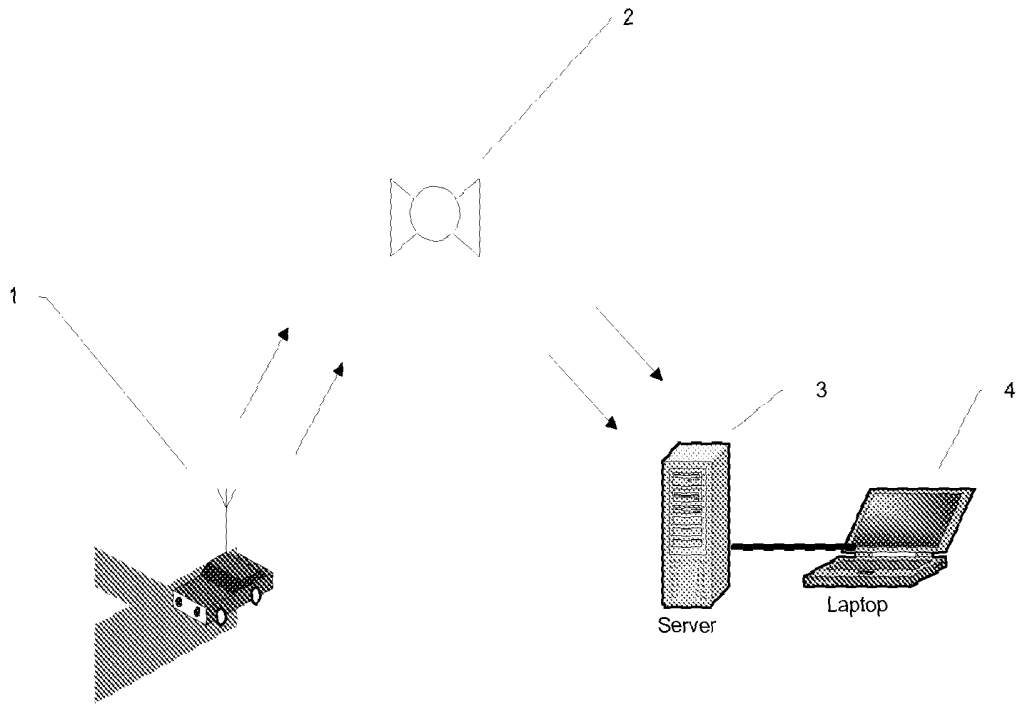


Figure 1 System Setup

Force Route Management and Text Messaging service system

The invention described herein, is a design that allows any Company to manage its Vehicles driving characteristics using planned routes which are beneficial to the company, as well as maintain constant communication contact with the work force in all driving situations. The system also provides an accurate telemetry of the vehicle position, speed and driving characteristics. A system is presented that allows a Portable Navigation Device (PND) to be forced to present a route programmed by the user to ensure that the route displayed by the PND is absolute and cannot be changed by the PND. The system then allows a route to be followed to ensure that the most efficient route based on cost can be used repeatedly. This system also provides a two way messaging service to be used without the need of mobile phones or any other device other than the PND. The PND can be remotely programmed to allow firmware upgrades as well as new route download from the Server. The system allows the full traceability of the journeys followed including general information of the vehicle speed, distance and stoppages.

BACKGROUND

This invention relates in general to all vehicles that are being used by companies for services or functions that require significant travel and so use significant expenditure on Vehicle maintenance including consumption of fuel for all journeys.

Many companies now utilize navigation systems such as Global Positioning Satellites (GPS) technology to assist drivers with directions while driving to the destinations. In some companies it is essential to follow an exact route such as Gritting vehicles, that need to ensure that the routes each vehicle is required to grit, has been done and not done in an arbitrarily way, that would cause some routes to be missed and so, giving rise to routes that could be potentially unsafe.

These Satellite Navigation systems (SAT NAV's or Portable Navigation Device (PND)) provide a visual map of the route on a Liquid Crystal Display system (LCD). The PND's systems generally do not contain any means of communication back to the company base ie location of company premises. They also require the driver to enter the destination point and then follow the "Best route" given by the PND. "Best Route" is the route that the PND calculates according to the setting parameters the user has programmed the PND with and hence, will be different for every single PND system. They will also be completely dependent on where the user is starting point and again, every system will uses its own algorithm, such that no two SAT NAVs could calculate an identical route.

Each company also faces the problem of defining the most efficient Vehicle routes the employees use to reduce the fuel consumption by taking differing routes each time the same journey is made. The vehicle definition in this description is "any mode of transport that uses fuel and provides an electrical interface to allow a system to be installed".

So at the present moment, there are no means of being able to program a PND or equivalent system with a predefined route to allow the journey route to be mapped for the vehicle driver and so ensuring that ONLY this route is explicitly followed. In addition to this there is no 2 way communication by text
5 that allows the driver or employee to be able to feedback information when requested by the company or office.

Thus in order to try and achieve an optimum route that is efficient in fuel or by a standard route that is identical every time the vehicle is driven, there is a need for a method and a system that provides the user with accurate route
10 displayed, that is sufficient enough to allow the driver to follow the planned route every time the same journey is made. This then overcomes the unpredictable calculation of the PND to give a different route each time.

There are many ways that other systems describe the behavior models of
15 systems to use data models based on global positioning services (GPS).

These systems include input information from users of the system. The input information being an evaluation of routes that the users have traversed and which maybe updated by users. However, these systems cannot be used by companies as they are again unpredictable when they require a point to point
20 journey

SUMMARY OF THE INVENTION

The invention described herein is based on that the system consists of a modem (with optional GPS tracking ability), a Multi User Interface (MUI) communications device and a Portable Navigation Device (PND). The MUI acts as a communication device between a remote server and the PND.

5 Preferably, the system function is to allow the following functions to be performed:-

- Receiving over the air software upgrades for itself making it fully re-configurable at anytime in its service life.
- Processing of two way communications (Text messages) between the
10 PND and the remote server. The interpretation of certain outbound text messages from the PND in order to allow the PND to act as a control interface.
- Receiving "Quick setup" text message lists to pass on to the PND to further the user's ability to communicate with the remote server and/or
15 the MUI control centre.
- Receiving route information from the remote server to programmatically control the PND destination.
- Being able to send and display textual information to the user of the PND that relates directly to the state of the MUI or the state of the
20 controlled route.
- Allowing the user to react to information presented to the user while driving by simple key answers.

- Allow the ability to present the routing of signals to the driver by other means such as screen keys which can illuminate individual keys to provide alarm or panic buttons.
 - Provide the means of a multi user interface capable of being
- 5 programmed to provide features that are not readily available on standard equipment which can make the use of PND and Modems and a server to act as a host of providing communications and data base.

Additional features and advantages can be realized through the techniques of the present invention by the features it provides. Other embodiments and

10 aspects of the invention are described in detail herein and are also considered as part of the claimed invention.

Brief Description of the drawings

For further interpretation of the design, references are made to the drawings

15 Figure 1 shows the top level system setup.

Figure 2 shows the system connections.

Detail Description

The MUI [6] ultimately acts as a filter between the remote server and the

20 PND. By doing so, the MUI [6] reduces the over the air cost of maintaining communications with the PND [5], improves reliability and reduces time lag issues (where time is a large factor). The system thus allows text messaging to be achieved without the use of a mobile phone or equivalent device the user may normally have to carry. The MUI [6] is totally configurable and is

able to control the PND to force a route selected by either the user or from the remote server.

The user of the PND[5] is able to select a route that the MUI [6] is to control.

They can stop the route or jump to any point of the route at any time.

5

The detailed description explains the embodiment of the invention, together with advantages and features, by way of operational functions. It is to be understood that variations of the described functions of the invention in its various aspects, as such, would be readily apparent to the skilled person, and
10 may be made without departing from the scope of the invention in any of its aspects.

The process of operation is outlined as follows:

- 15 • On power up the MUI[6] attempts to establish connections with both the remote Server and the PND[5].
- Upon a successful connection, the MUI[6] clears out existing information from the PND[5] and sends its latest "Quick Setup" list. This list typically contains a list of commands the user can use, a
20 simple list of routes the user can start and a few default text messages to allow quick communication with the remote server. However, the list can be updated at any time by the remote server.
- Once the user is ready to select a route (or the remote server has

instructed the MUI[6] to) then the user can use the PND's [5] text message interface (including the "quick setup" messages) to specify a route to start. The user can also specify where in the route they wish to start from (the default is the beginning)

- 5 • Optionally, the MUI [6] will check with the remote server to ensure it has the latest route information. The MUI [6] will then accept the latest route from the remote server.
- The MUI[6] then initiates the route by sending the necessary commands to the PND[5].
- 10 • The MUI[6] constantly monitors all information from the PND [5] to establish which part of the route the PND[5] is currently on (by implication, where the user is in the world). If the PND [5] is deemed to have completed a segment of the route, the MUI [6] will then feed another set of co-ordinates to the PND [5] to continue the journey.
- 15 • The user may wish to stop the route or jump to a route at any point. The MUI [6] will adjust to suit the user's demands and will respond to text messages from the PND [5].
- In the event of a power cycle, the MUI [6] will recover and re-initiate the route in the last known state.
- 20 • The MUI [6] is capable of reporting to the user event data (contained within the route file) as and when the conditions are met. This is in the form of receiving a text message on the PND [5]. It is optional whether the message simply ends up in the inbox or is directly displayed on the screen.

- On completion of the route, the user is informed and the MUI [6] relinquishes control of the PND[5].

FIG. 1 shows one example of a system hardware setup. Figure 2 shows the
5 system block function installed internal to the vehicle

In Figure 1, the PND [5] fitted to vehicle [1] allows the vehicle to obtain its position by using its GPS from the satellite [2]. At the same time it also transmits its position to the system Server [3]. This basic communication allows the basis of the hardware function to be setup. . The power to the
10 devices is routed from the vehicle fuse[10] via the power bus [9]. The PND [5] is a standard Portable Navigation Device which has an external communication link [8] to the MUI [6] the communication link is achieved by standard communication protocols such as RS232 and not limited to any other Serial/parallel communication busses. The MUI [6] is connected to the
15 Modem [7] by a similar communication bus. Power routing is harnessed between each system from the vehicle and is fitted by utilizing the vehicle fuse system. The Modem allows the data interface between the MUI[6] to provide a path for information flow between the Server (over the air). The MUI [6] controls the flow of information and the routes assigned to the PND[5]. When
20 Text is to be transmitted from the PND[5] it is filtered via the MUI[6] and transmitted by the Modem[7] unit to the server. This can then be viewed by the user by any standard devices that allow internet connections.

Preferably the Modem is also a standalone device which incorporates its own GPS and GSM capability. This device transmits real-time information of the vehicle tracking to the server data by the GPS system.

The functional described in this patent can be tweaked for every system and
5 so it is expected that anyone in the field of tracking could make minor changes to comply with their system, however it cannot change from the main fact that the system provides a pre-programmed route for a PND.

CLAIMS

1. A system for a providing a predetermined route to be followed based
5 on User interactive global positioning services (GPS), comprising;
a Portable Navigation Device (PND),
a Multi User Interface unit (MUI),
a Modem unit linked to a remote Server or network,
means to provide a display interface to allow the user to follow a
10 defined route,
and a means of a display with an interactive menu to provide a
messaging service information,
to allow the system to provide a means of guidance for pre-determined routes
to be displayed.
- 15
2. The system of claim 1, allowing the firmware inside the MUI to be
upgraded over the air waves.
3. The system of claim 1, wherein the PND is utilized to establish the
20 location of the user and the streaming data is filtered to allow the PND output
information presented to it from the external interfaces.

4. The system of claim 1, wherein the PND is utilized to present data from
5 the Server.

5. The system of claim 3, wherein the input information is utilized to
determine the physical location traversed by the user of the route and force
the User to follow the exact route programmed regardless of deviation.

10

6. The system of claim 5, wherein the information is further configured to
allow text messaging transmitted by the Server to be display on the PND.

7. The system of claim 6, wherein the information is further configured to
15 render a response to the Server based upon the user response entered on
the PND.

8. The system of claim 1, wherein the information is further configured to
render a map with preference attributes such that the map shall be the
20 instructional tool followed by the user.

9. The system of claim 1, being further configured to stored pre-
programmed routes accessible at anytime.

10. The system of claim 1, being further configured to stored routes sent by the Server over the air waves accessible at anytime.

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11. The system of claim 1, wherein the information input includes at least one of, (i) a keypad or (ii)a touch Screen for manually entering input information

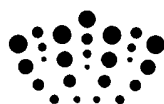
10 12. The system of claim 1, wherein the data collected via the modem unit is collected in real time and stored on the server or network.

13. The system of claim 1, wherein the MUI provides an interface to control other electronic accessories such as panic buttons or alarms.

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14. The system of claim 1, wherein the MUI, modem and Server provide multi user communication interface being controlled by the Server.

15. The system of claim 1, wherein the modem and Server provide multi
20 user data base for the MUI.



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Examiner: Richard Kerslake

Claims searched: 1-15

Date of search: 9 July 2009

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1,3,4,8 & 10-13 at least	GB2376297 A (KATOH) See whole document
X	1,3,4,8 & 10-13 at least	GB2360588 A (AGNEW) See whole document
X	1,3,4,8 & 11-13 at least	US2007/0288163 A1 (MEYER et al.) See whole document
X	1,3,4,8 & 11-13 at least	US5760742 A (BRANCH et al.) See whole document
X	1,3,4 & 10-13 at least	US2002/006506 A1 (KAWAI et al.) See whole document
X	1,3,4,8 & 10-12 at least	WO97/31241 A1 (SIEMENS) See whole document
A	-	DE19744419 A1 (KIESER et al.) See EPO abstract

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

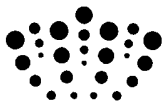
Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X:

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Worldwide search of patent documents classified in the following areas of the IPC

G01C; G08G

The following online and other databases have been used in the preparation of this search report



EPODOC,WPI

International Classification:

Subclass	Subgroup	Valid From
G01C	0021/34	01/01/2006