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(54) **PORTABLE NAVIGATION DEVICE**

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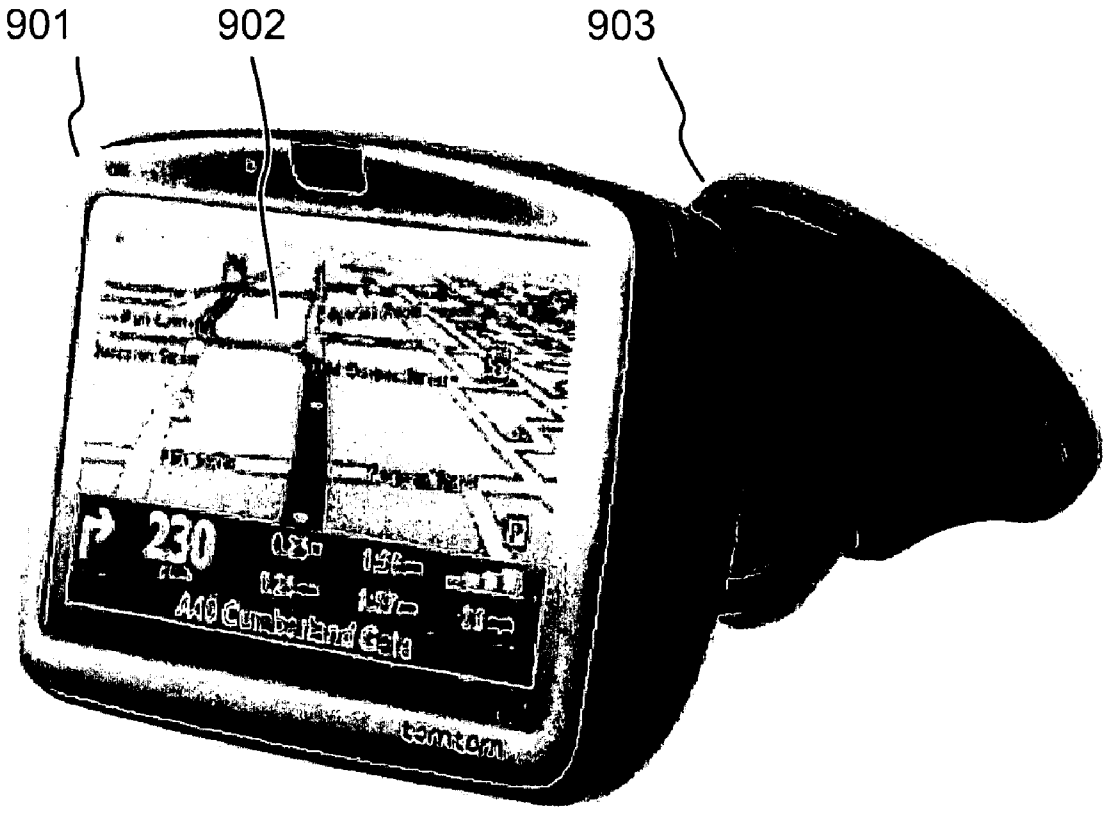
(57) **ABSTRACT**

A method and a navigation device to display a multiple page menu comprising configuration options for activation of a first or a second operational mode depending on various parameters including speed, usage of menu items, and usage of navigation device in either of the first and second operational modes, and means for determining whether the first or second operational mode is activated.



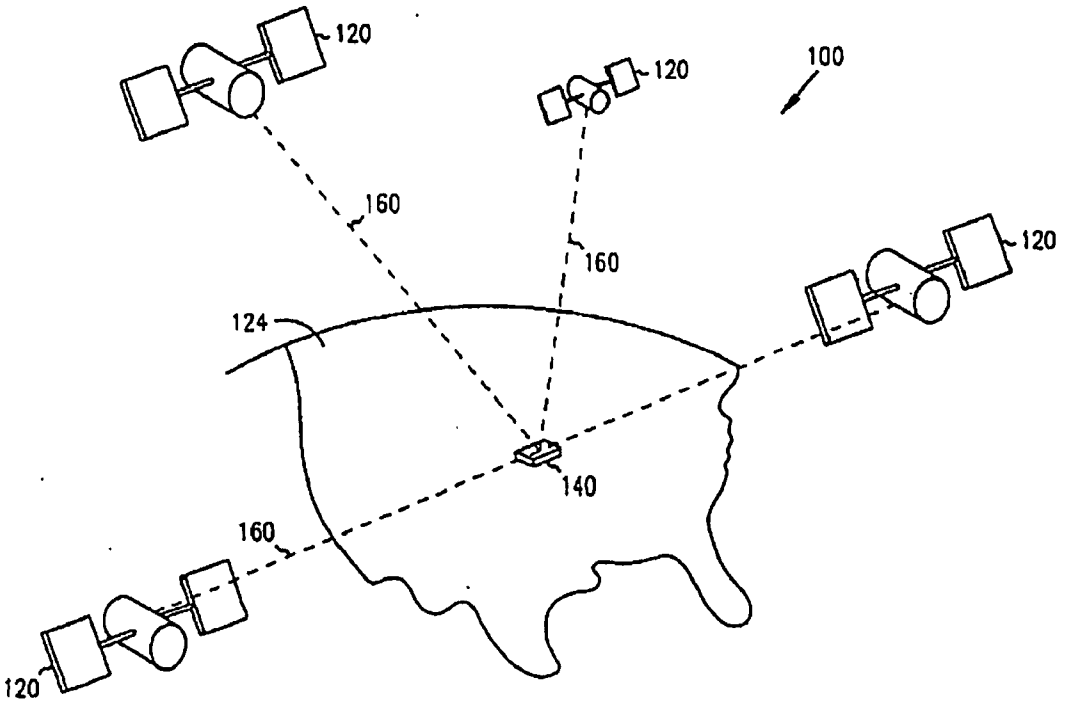


Figure 1

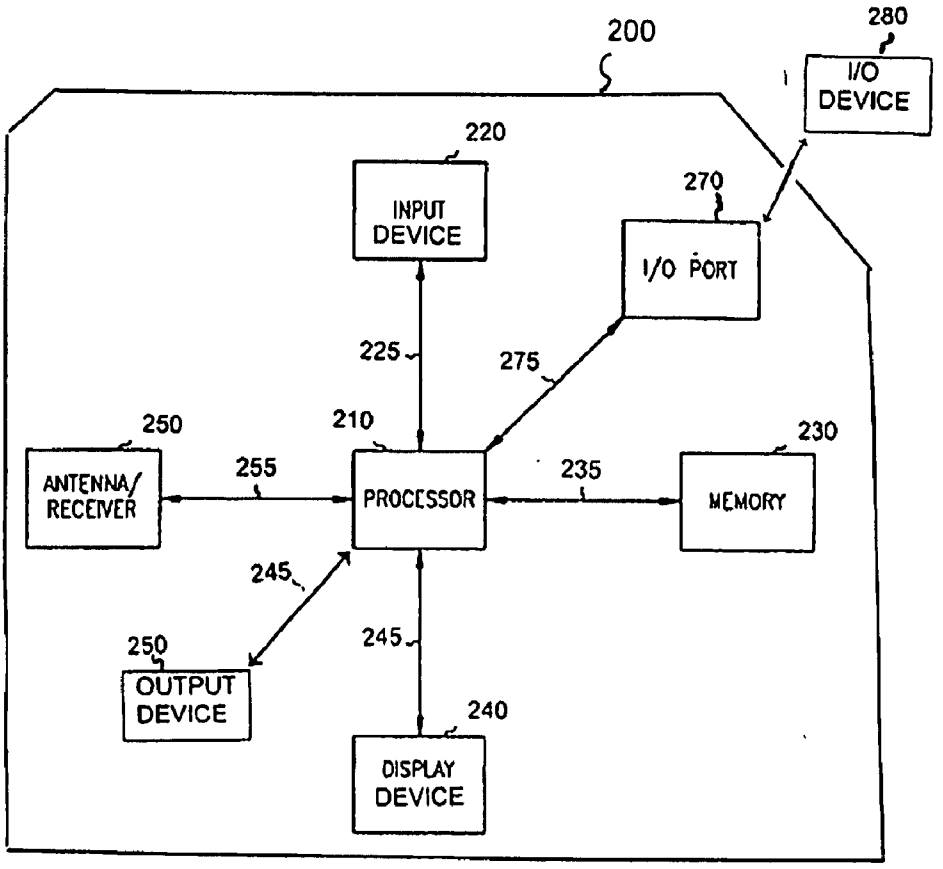

200
280
I/O DEVICE
220
INPUT DEVICE
270
I/O PORT
225
275
250
210
230
ANTENNA/ RECEIVER
255
PROCESSOR
235
MEMORY
245
250
245
OUTPUT DEVICE
240
DISPLAY DEVICE

Figure 2

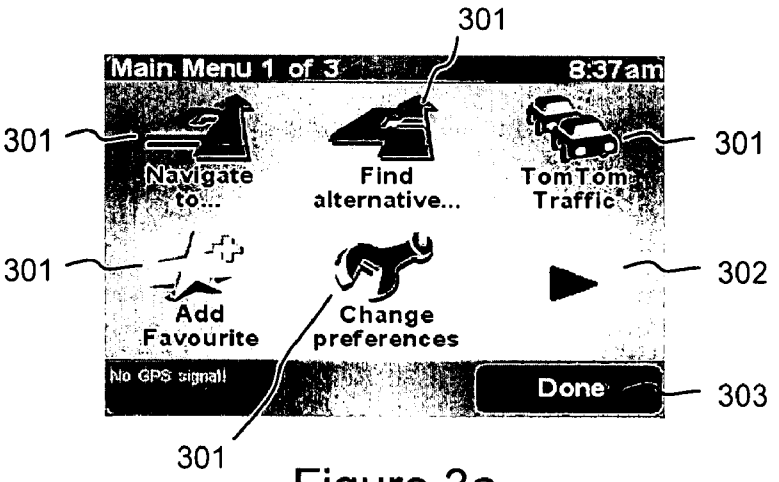


Figure 3a

Figure 3b

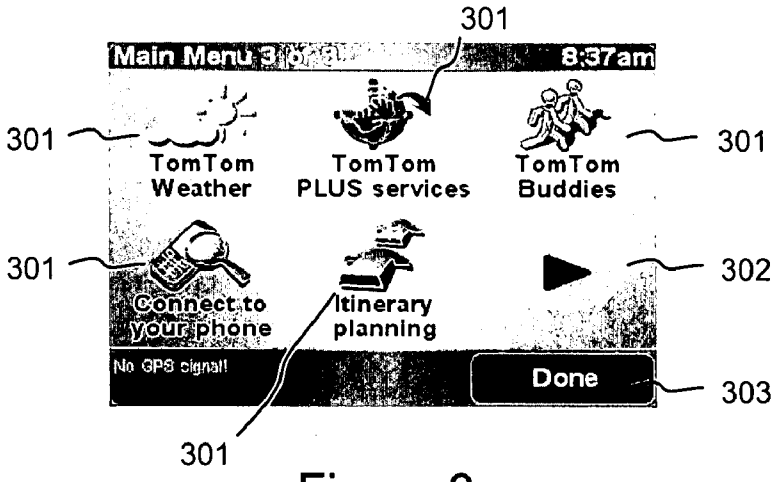


Figure 3c

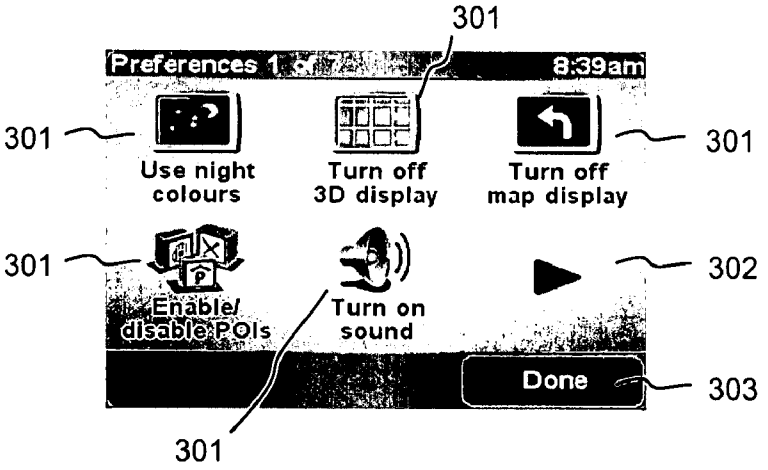


Figure 4a

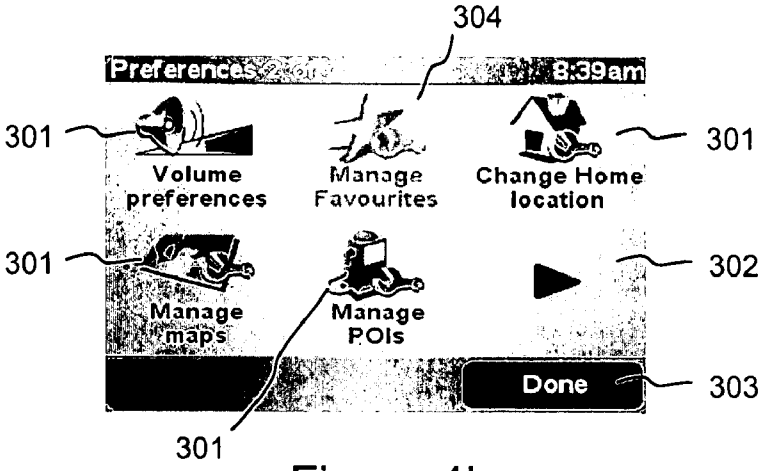


Figure 4b

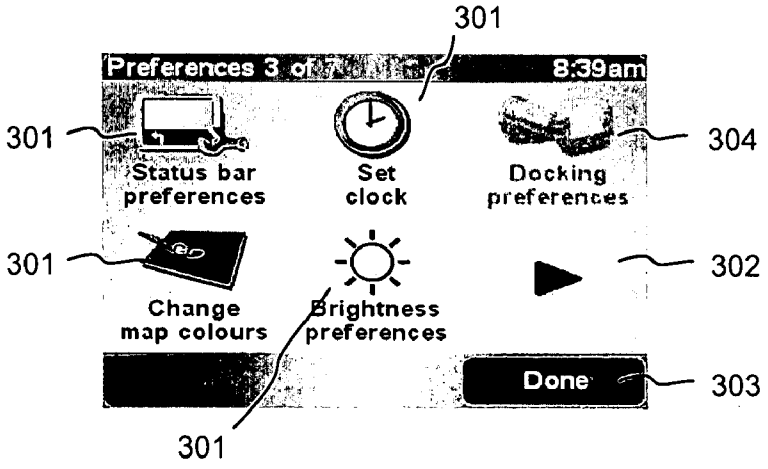


Figure 4c

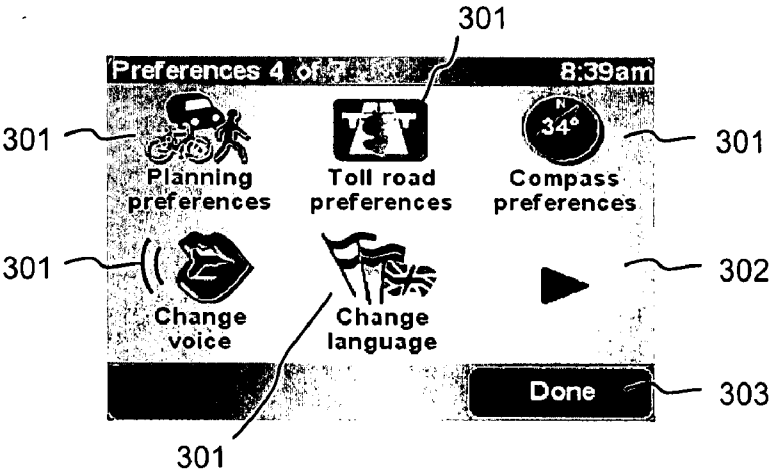


Figure 4d

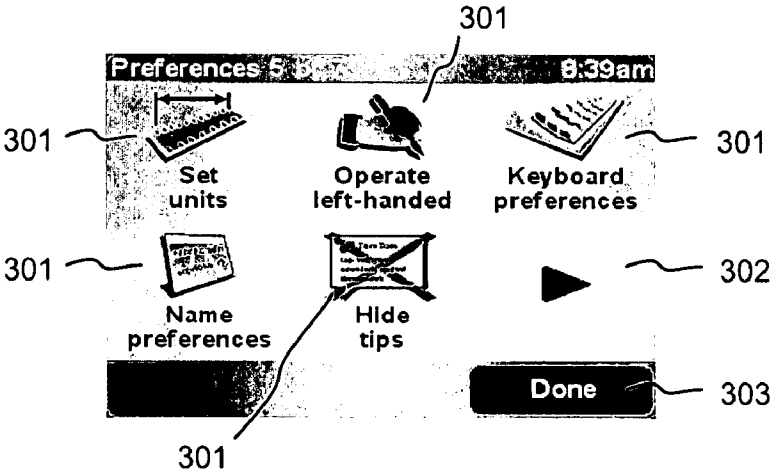


Figure 4e

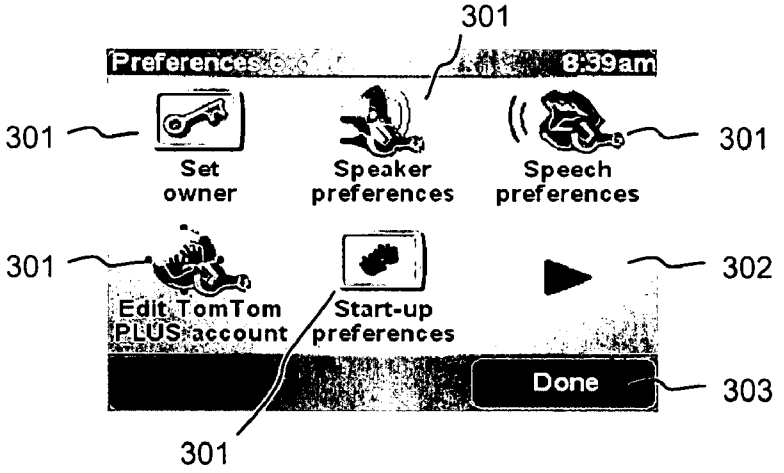


Figure 4f

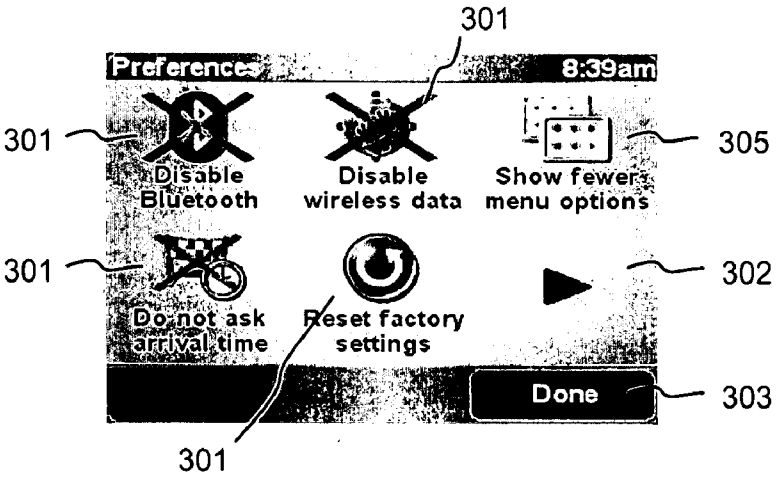


Figure 4g

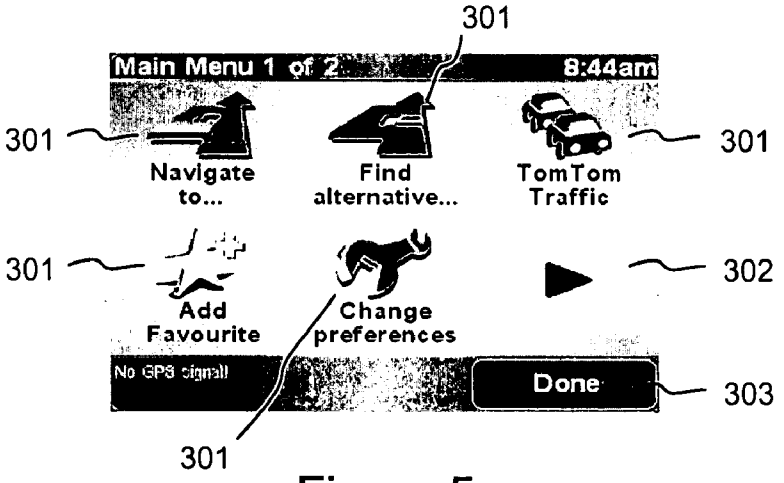


Figure 5a

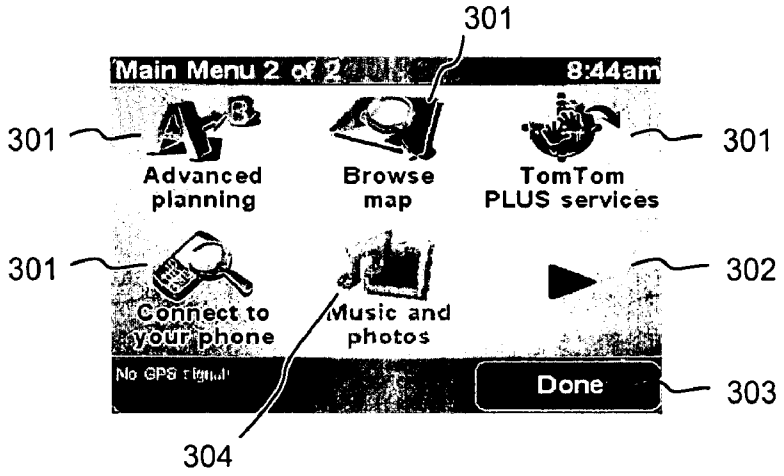


Figure 5b

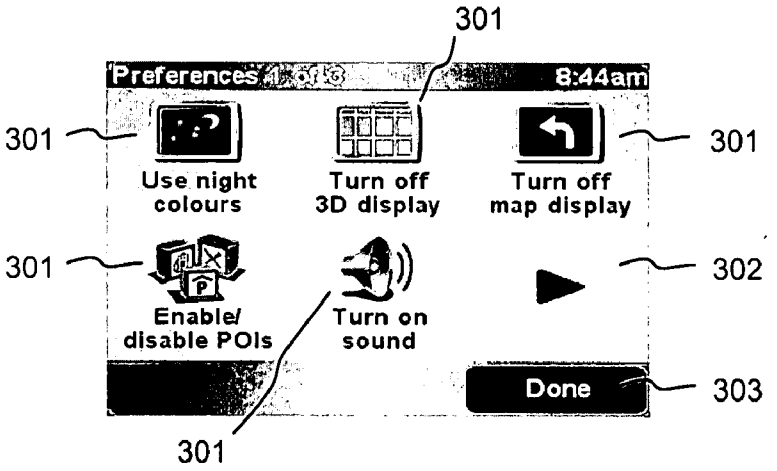


Figure 6a

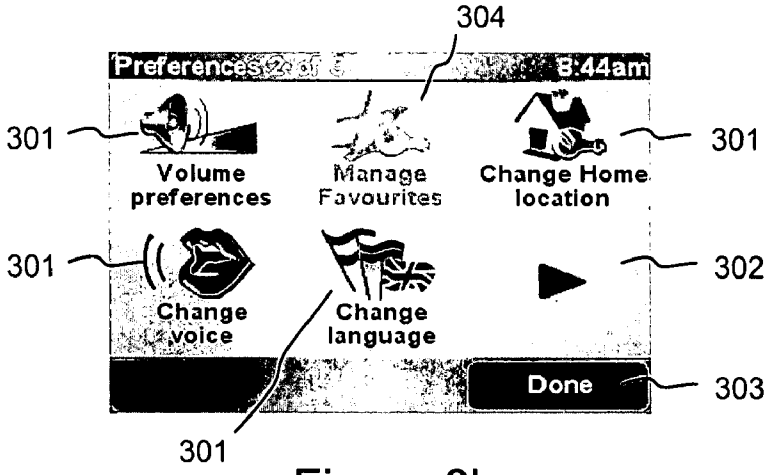


Figure 6b

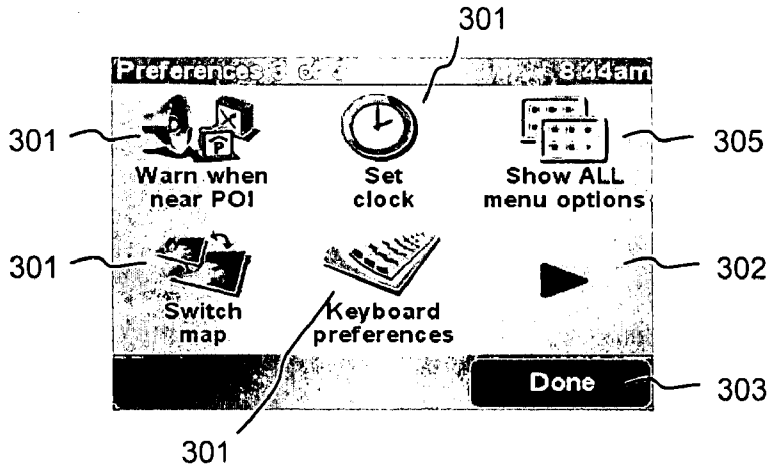


Figure 6c

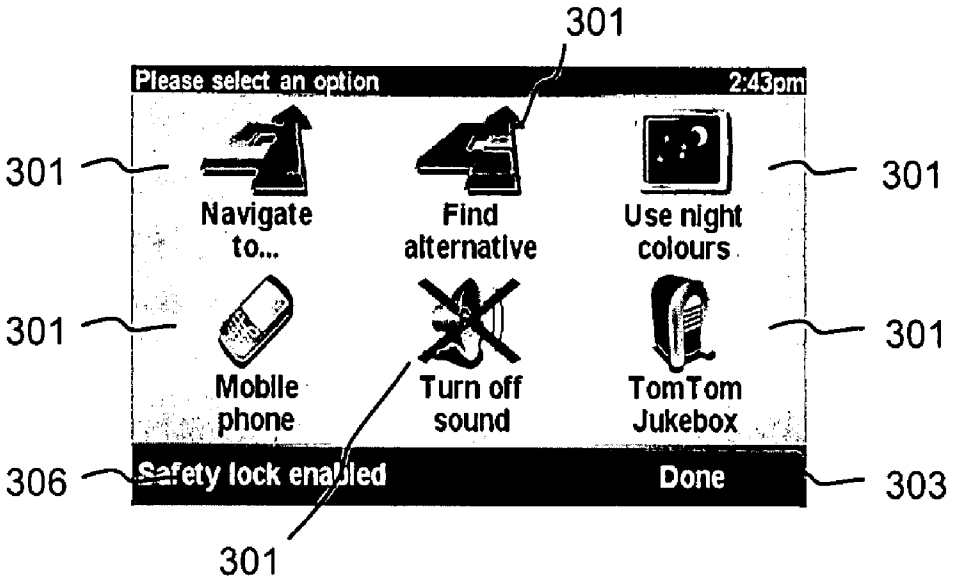


Figure 7a

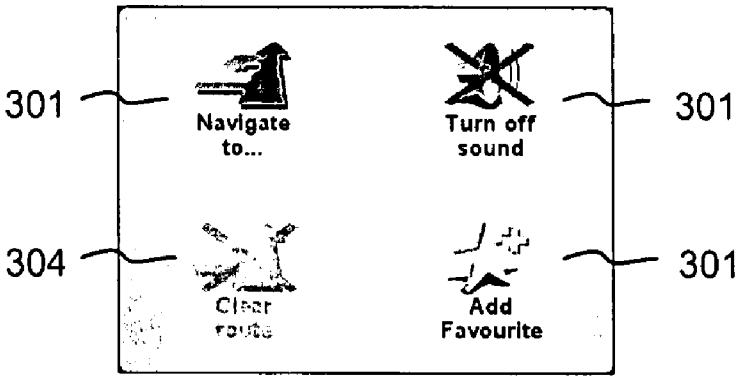


Figure 7b

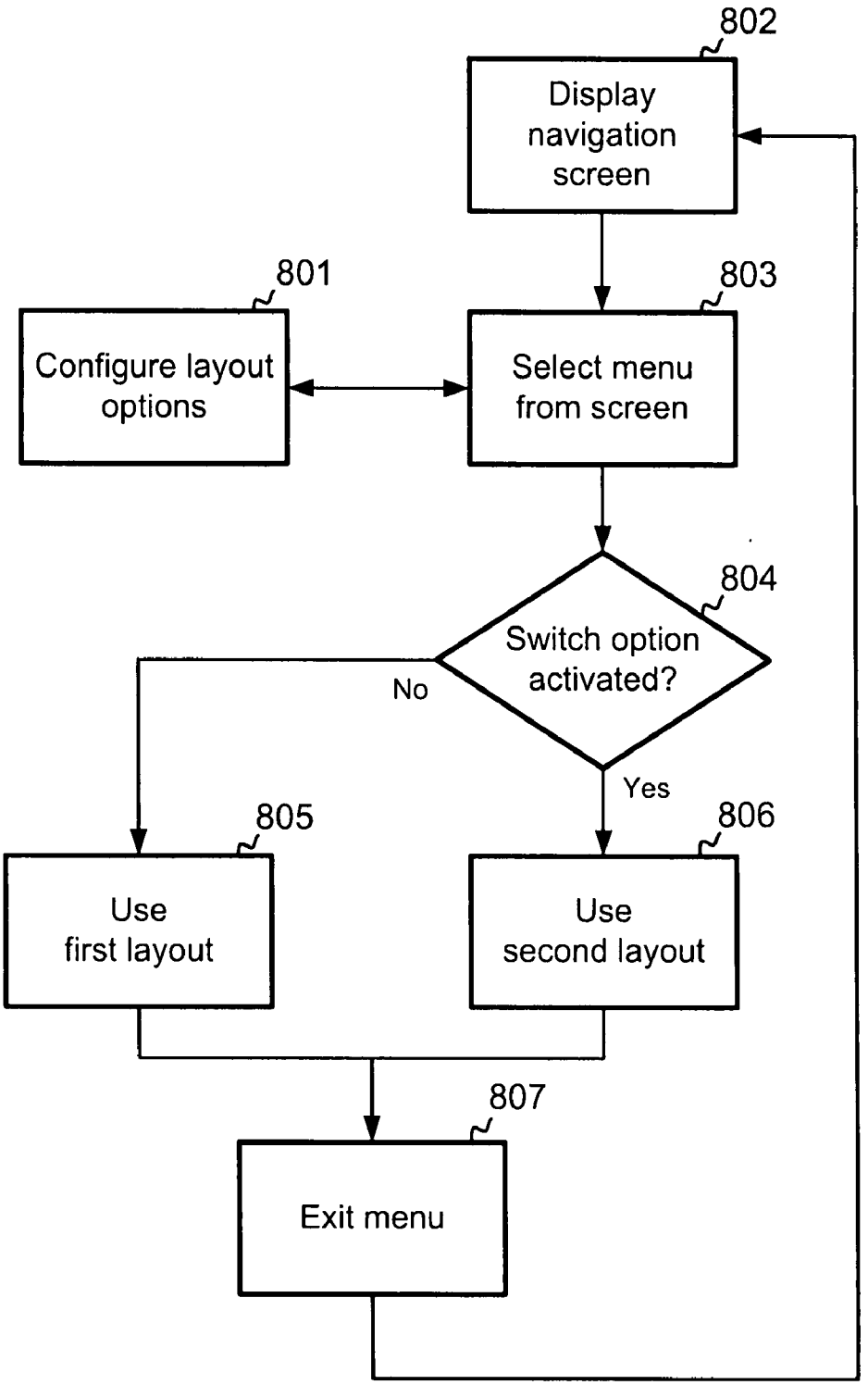

802
Display navigation screen
801
Configure layout options
803
Select menu from screen
804
Switch option activated?
No
Yes
805
Use first layout
806
Use second layout
807
Exit menu

Figure 8

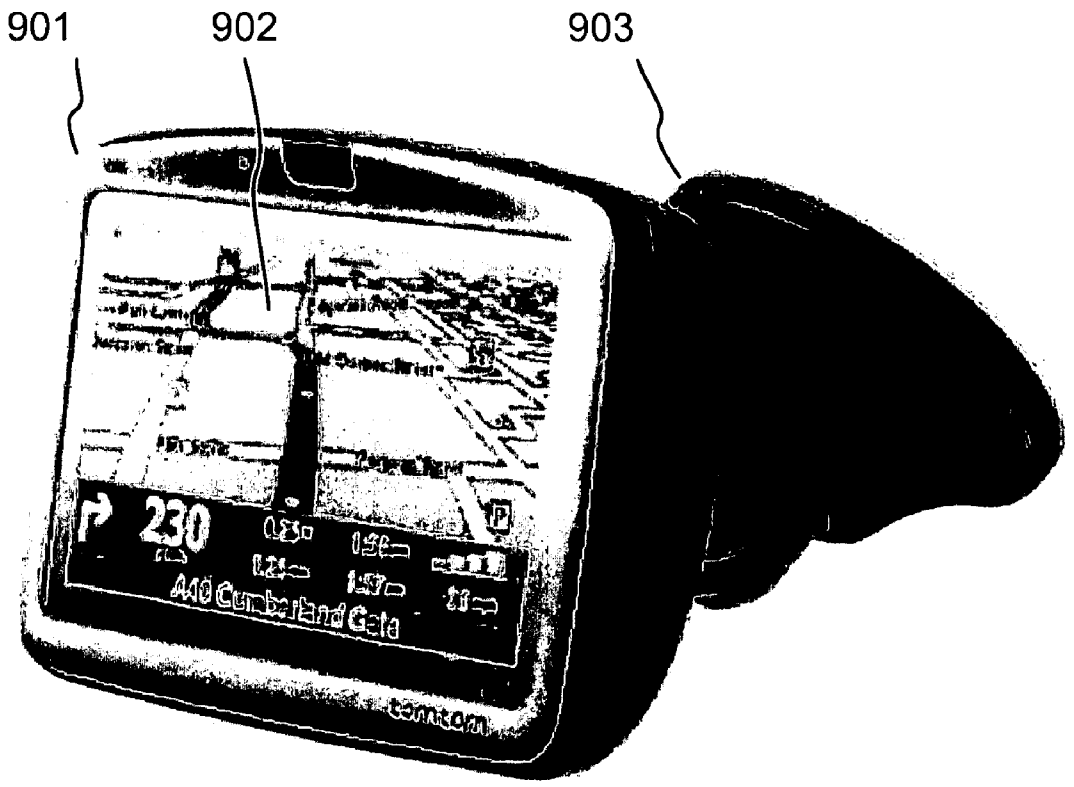


Figure 9

PORTABLE NAVIGATION DEVICE

REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority under 35 U.S.C. §119 on Great Britain Patent Applications 0604709.6, 0604708.8, 0604710.4, 0604704.7, and 0604706.2, each filed Mar. 8, 2006. The aforementioned patent applications are incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to a portable navigation device, including functionality for

[0004] 2. Description of the Prior Art

[0005] Global Positioning System GPS based navigation devices are well known and are widely employed as in-car navigation devices. Reference may be made to devices that integrate a GPS receiver into a computing device programmed with a map database and that can generate navigation instructions on a display, such as the TOMTOM GO device. These portable, integrated devices are often mounted on or in the dashboard of a vehicle using a suction mount or a docking mechanism.

[0006] Reference may also be made to the Navigator series software from the present assignee, TomTom International B.V. This software, when running on a Personal Digital Assistant PDA with GPS receiver (such as a COMPAQ IPAQ) or connected to an external GPS receiver, enables a user to input to the PDA a start and destination address. The software then calculates the best route between the two end-points and displays instructions on how to navigate that route.

[0007] The term 'navigation device' refers to a device that enables a user to navigate to a pre-defined destination. The device may have an internal system for receiving location data, such as a GPS receiver, or may merely be connectable to a receiver that can receive location data. The device may compute a route itself, or communicate with a remote server that computes the route and provides navigation information to the device, or a hybrid device in which the device itself and a remote server both play a role in the route computation process. Portable GPS navigation devices are not permanently integrated into a vehicle but instead are devices that can readily be mounted in or docked or otherwise used inside a vehicle. Generally (but not necessarily), they are fully self-contained—i.e. include an internal GPS antenna, navigation software and maps and can hence plot and display a route to be taken.

[0008] By using the positional information derived from the integrated or external GPS receiver, the software can determine at regular intervals the position of the navigation device or PDA (typically mounted on the dashboard of a vehicle) and can display the current position of the vehicle on a map and display (and speak) appropriate navigation instructions (e.g. 'turn left in 100 m') on the screen.

[0009] Formerly, the sole functions of a navigation device have been mapping and routing related, which have been supplemented by various communication, entertainment, information retrieval services and functionalities.

[0010] For example, a navigation device can be connected to a large number external devices such as mobile telephones, loudspeakers, wireless headphones, audio devices, storage devices, docking stations, personal computers, traffic information systems, external aerials to name a few. It is also possible to install applications and data files on the device itself to create many additional features on the navigation device. Therefore, besides internally implemented features, the navigation device may access an almost unlimited number of external services and functionalities as long as it is supported by the hardware and software components of the navigation device.

[0011] The ever increasing number of features implemented on a typical navigation device inevitably resulted in more and more complex graphical user interfaces and menu layouts. It is common that a typical user interface of a navigation device uses several menu panes (pages/tabs/etc) and various sub-menus to allow access to all functionalities and services of the navigation device.

[0012] On the other hand, navigation devices are typically used when driving or walking from one place to another. The user may need to access the features of the navigation device while driving, which requires a great effort and causes distraction.

[0013] Some users, e.g. new owners of a navigation device, may find it confusing to find a large number of services and functionalities on the navigation device while they are mainly interested in basic navigation functionalities. They may wish to rapidly access the basic services and functionalities while at a later time, they may wish to try the rest of the services and functionalities supported by the navigation device.

[0014] Thus there is a need to provide a simple yet effective user interface for a navigation device supporting complex features and a high number of functions.

SUMMARY OF THE INVENTION

[0015] The invention is a navigation device comprising a . . . The invention is also a method of . . .

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The present invention will be described with reference to the accompanying drawings, in which

[0017] FIG. **1** illustrates an example view of a global positioning system.

[0018] FIG. **2** illustrates an example block diagram of electronic components of a navigation device of an embodiment of the present application;

[0019] FIG. **3***a* is a screenshot of the first page of the main menu of a navigation device implementing the invention.

[0020] FIG. **3***b* is a screenshot of the second page of the main menu of a navigation device implementing the invention.

[0021] FIG. **3***c* is a screenshot of the third page of the main menu of a navigation device implementing the invention.

[0022] FIG. **4***a* is a screenshot of the first page of the preferences menu of a navigation device implementing the invention.

[0023] FIG. **4***b* is a screenshot of the second page of the preferences menu of a navigation device implementing the invention.

[0024] FIG. **4***c* is a screenshot of the third page of the preferences menu of a navigation device implementing the invention.

[0025] FIG. **4***d* is a screenshot of the fourth page of the preferences menu of a navigation device implementing the invention.

[0026] FIG. **4***e* is a screenshot of the fifth page of the preferences menu of a navigation device implementing the invention.

[0027] FIG. **4***f* is a screenshot of the sixth page of the preferences menu of a navigation device implementing the invention.

[0028] FIG. **4***g* is a screenshot of the seventh page of the preferences menu of a navigation device implementing the invention.

[0029] FIG. **5***a* is a screenshot of the first page of a simplified main menu of a navigation device implementing the invention.

[0030] FIG. **5***b* is a screenshot of the second page of a simplified main menu of a navigation device implementing the invention.

[0031] FIG. **6***a* is a screenshot of the first page of a simplified preferences menu of a navigation device implementing the invention.

[0032] FIG. **6***b* is a screenshot of the second page of a simplified preferences menu of a navigation device implementing the invention.

[0033] FIG. **6***c* is a screenshot of the third page of a simplified preferences menu of a navigation device implementing the invention.

[0034] FIG. **7***a* is a screenshot of a simplified menu (consisting of a single page) of a navigation device implementing the invention.

[0035] FIG. **7***b* is another screenshot of a simplified menu (consisting of a single page) of a navigation device implementing the invention.

[0036] FIG. **8** is a flowchart illustrating an embodiment of the invention.

[0037] FIG. **9** is a three-dimensional view of a navigation device attached to its docking station.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0038] Embodiments of the present invention will be described below in detail with reference to the accompanying drawings.

[0039] The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of the present invention. As used herein, the singular forms "a", an", and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms "includes" and/or "including", when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

[0040] In describing example embodiments illustrated in the drawings, specific terminology is employed for the sake of clarity. However, the disclosure of this patent specification is not intended to be limited to the specific terminology so selected and it is to be understood that each specific element includes all technical equivalents that operate in a similar manner.

[0041] Referencing the drawings, wherein like reference numerals designate identical or corresponding parts throughout the several views, example embodiments of the present patent application are hereafter described. Like numbers refer to like elements throughout. As used herein, the term "and/or" includes any and all combinations of one or more of the associated listed items.

[0042] FIG. **1** illustrates an example view of Global Positioning System (GPS), usable by navigation devices, including the navigation device of embodiments of the present application. Such systems are known and are used for a variety of purposes. In general, GPS is a satellite-radio based navigation system capable of determining continuous position, velocity, time, and in some instances direction information for an unlimited number of users.

[0043] Formerly known as NAVSTAR, the GPS incorporates a plurality of satellites which work with the earth in extremely precise orbits. Based on these precise orbits, GPS satellites can relay their location to any number of receiving units.

[0044] The GPS system is implemented when a device, specially equipped to receive GPS data, begins scanning radio frequencies for GPS satellite signals. Upon receiving a radio signal from a GPS satellite, the device determines the precise location of that satellite via one of a plurality of different conventional methods. The device will continue scanning, in most instances, for signals until it has acquired at least three different satellite signals (noting that position is not normally, but can be determined, with only two signals using other triangulation techniques). Implementing geometric triangulation, the receiver utilizes the three known positions to determine its own two-dimensional position relative to the satellites. This can be done in a known manner. Additionally, acquiring a fourth satellite signal will allow the receiving device to calculate its three dimensional position by the same geometrical calculation in a known manner. The position and velocity data can be updated in real time on a continuous basis by an unlimited number of users.

[0045] As shown in FIG. **1**, the GPS system is denoted generally by reference numeral **100**. A plurality of satellites **120** are in orbit about the earth **124**. The orbit of each satellite **120** is not necessarily synchronous with the orbits of other satellites **120** and, in fact, is likely asynchronous. A GPS receiver **140**, usable in embodiments of navigation devices of the present application, is shown receiving spread spectrum GPS satellite signals **160** from the various satellites **120**.

[0046] The spread spectrum signals **160**, continuously transmitted from each satellite **120**, utilize a highly accurate

frequency standard accomplished with an extremely accurate atomic clock. Each satellite **120**, as part of its data signal transmission **160**, transmits a data stream indicative of that particular satellite **120**. It is appreciated by those skilled in the relevant art that the GPS receiver device **140** generally acquires spread spectrum GPS satellite signals **160** from at least three satellites **120** for the GPS receiver device **140** to calculate its two-dimensional position by triangulation. Acquisition of an additional signal, resulting in signals **160** from a total of four satellites **120**, permits the GPS receiver device **140** to calculate its three-dimensional position in a known manner.

[**0047**] FIG. **2** illustrates an example block diagram of electronic components of a navigation device **200** of an embodiment of the present application, in block component format. It should be noted that the block diagram of the navigation device **200** is not inclusive of all components of the navigation device, but is only representative of many example components.

[**0048**] The navigation device **200** is located within a housing (not shown). The housing includes a processor **210** connected to an input device **220** and a display screen **240**. The input device **220** can include a keyboard device, voice input device, and/or any other known input device utilized to input information; and the display screen **240** can include any type of display screen such as an LCD display, for example. In at least one embodiment of the present application, the input device **220** and display screen **240** are integrated into an integrated input and display device, including a touchpad or touchscreen input wherein a user need only touch a portion of the display screen **240** to select one of a plurality of display choices or to activate one of a plurality of virtual buttons.

[**0049**] In addition, other types of output devices **250** can also include, including but not limited to, an audible output device. As output device **250** can produce audible information to a user of the navigation device **200**, it is equally understood that input device **240** can also include a microphone and software for receiving input voice commands as well.

[**0050**] In the navigation device **200**, processor **210** is operatively connected to and set to receive input information from input device **240** via a connection **225**, and operatively connected to at least one of display screen **240** and output device **250**, via output connections **245**, to output information thereto. Further, the processor **210** is operatively connected to memory **230** via connection **235** and is further adapted to receive/send information from/to input/output (I/O) ports **270** via connection **275**, wherein the I/O port **270** is connectible to an I/O device **280** external to the navigation device **200**. The external I/O device **270** may include, but is not limited to an external listening device such as an earpiece for example. The connection to I/O device **280** can further be a wired or wireless connection to any other external device such as a car stereo unit for hands-free operation and/or for voice activated operation for example, for connection to an ear piece or head phones, and/or for connection to a mobile phone for example, wherein the mobile phone connection may be used to establish a data connection between the navigation device **200** and the internet or any other network for example, and/or to establish a connection to a server via the internet or some other network for example.

[**0051**] The navigation device **200**, in at least one embodiment, may establish a "mobile" network connection with the server **302** via a mobile device **400** (such as a mobile phone, PDA, and/or any device with mobile phone technology) establishing a digital connection (such as a digital connection via known Bluetooth technology for example). Thereafter, through its network service provider, the mobile device **400** can establish a network connection (through the internet for example) with a server **302**. As such, a "mobile" network connection is established between the navigation device **200** (which can be, and often times is mobile as it travels alone and/or in a vehicle) and the server **302** to provide a "real-time" or at least very "up to date" gateway for information.

[**0052**] The establishing of the network connection between the mobile device **400** (via a service provider) and another device such as the server **302**, using the internet **410** for example, can be done in a known manner. This can include use of TCP/IP layered protocol for example. The mobile device **400** can utilize any number of communication standards such as CDMA, GSM, WAN, etc.

[**0053**] As such, an internet connection may be utilized which is achieved via data connection, via a mobile phone or mobile phone technology within the navigation device **200** for example. For this connection, an internet connection between the server **302** and the navigation device **200** is established. This can be done, for example, through a mobile phone or other mobile device and a GPRS (General Packet Radio Service)-connection (GPRS connection is a high-speed data connection for mobile devices provided by telecom operators; a method to connect to the internet).

[**0054**] The navigation device **200** can further complete a data connection with the mobile device **400**, and eventually with the internet **410** and server **302**, via existing Bluetooth technology for example, in a known manner, wherein the data protocol can utilize any number of standards, such as the GPRS, the Data Protocol Standard for the GSM standard, for example.

[**0055**] The navigation device **200** may include its own mobile phone technology within the navigation device **200** itself (including an antenna for example, wherein the internal antenna of the navigation device **200** can further alternatively be used). The mobile phone technology within the navigation device **200** can include internal components as specified above, and/or can include an insertable card, complete with necessary mobile phone technology and/or an antenna for example. As such, mobile phone technology within the navigation device **200** can similarly establish a network connection between the navigation device **200** and the server **302**, via the internet **410** for example, in a manner similar to that of any mobile device **400**.

[**0056**] For GPRS phone settings, the Bluetooth enabled device may be used to correctly work with the ever changing spectrum of mobile phone models, manufacturers, etc., model/manufacturer specific settings may be stored on the navigation device **200** for example. The data stored for this information can be updated in a manner discussed in any of the embodiments, previous and subsequent.

[**0057**] FIG. **2** further illustrates an operative connection between the processor **210** and an antenna/receiver **250** via connection **255**, wherein the antenna/receiver **250** can be a

GPS antenna/receiver for example. It will be understood that the antenna and receiver designated by reference numeral **250** are combined schematically for illustration, but that the antenna and receiver may be separately located components, and that the antenna may be a GPS patch antenna or helical antenna for example.

[**0058**] Further, it will be understood by one of ordinary skill in the art that the electronic components shown in FIG. **2** are powered by power sources (not shown) in a conventional manner. As will be understood by one of ordinary skill in the art, different configurations of the components shown in FIG. **2** are considered within the scope of the present application. For example, in one embodiment, the components shown in FIG. **2** may be in communication with one another via wired and/or wireless connections and the like. Thus, the scope of the navigation device **200** of the present application includes a portable or handheld navigation device **200**.

[**0059**] In addition, the portable or handheld navigation device **200** of FIG. **2** can be connected or "docked" in a known manner to a motorized vehicle such as a car or boat for example. Such a navigation device **200** is then removable from the docked location for portable or handheld navigation use.

[**0060**] As indicated above in FIG. **2** of the application, a navigation device **200** of an embodiment of the present application includes a processor **210**, an input device **220**, and a display screen **240**. In at least one embodiment, the input device **220** and display screen **240** are integrated into an integrated input and display device to enable both input of information (via direct input, menu selection, etc.) and display of information through a touch panel screen, for example. Such a screen may be a touch input LCD screen, for example, as is well known to those of ordinary skill in the art.

[**0061**] FIGS. **3***a*, **3***b*, and **3***c* are screenshots from the main menu of a navigation device **200** according to the invention. Various menu items **301** are presented using text labels and/or icons that provide access to various functions or further sub-menus of the navigation device **200**.

[**0062**] By pressing next button **302**, it is possible to advance between the multiple pages of the main menu of the navigation device **200** (shown in FIGS. **3***a*, **3***b*, and **3***c* respectively). Next button **302** might be labeled as "next", "forward" or similar, or it might be replaced with appropriate icons, such as an arrow in FIGS. **3***a*, **3***b*, and **3***c*. It is also possible that an additional back button is provided (not shown) to move around in the menu in reverse order. Done button **303** can be selected for exiting the main menu. Done button **303** may also be labeled as "cancel", "exit", "finished" or similar, it might be indicated with text or icon or a combination thereof. An exit function may be invoked automatically after a certain time of inactivity, in which case, done button **303** may be omitted.

[**0063**] Some features of the navigation device might be indicated using different colors such as semi-transparent or grey-scale colors, or using an alternate icon/text type such as a disabled function **304** shown in FIG. **3***b*. A disabled function **304** might indicate a feature that the navigation device **200** is capable of but which has been turned of for some reason. A disabled function **304** may depend on files present on the navigation device, which might include multimedia files, registration data, driver files, encryption keys, saved files and the like. A disabled function **304** might also require an active subscription to services or a connection to external devices in order to become a functioning menu item **301**.

[**0064**] FIG. **4***a* illustrates a preferences menu of the navigation device **200** according to the invention. Menu items **301**, next button **302**, done button **303** are shown according to the previous examples in FIGS. **3***a*, **3***b*, and **3***c*. In other implementations, some of the buttons **301**-**303** may be omitted, menus might be arranged differently, for example, the preferences menu might be either an independent menu or a sub-menu. FIG. **4***a* is actually a screenshot of the first page of a preferences menu consisting of multiple pages. In other implementations, a preferences menu might be called setup, configuration menu, or similar.

[**0065**] FIGS. **4***b* to **4***g* illustrate further pages of the preferences menu, with menu items **301**, next buttons **302**, done buttons **303**, and disabled functions **304**. Apparently, the exemplary features of a navigation device **200** require a large number of icons and shortcuts spread across multiple menus or menu pages. Even though there are a large number of functions and services implemented in a navigation device **200**, only a limited number of items can be shown on one menu page to ensure a relatively safe operation while driving.

[**0066**] On the last page of the preferences menu, a switch button **305** is provided for changing to a different menu layout according to the invention. In this embodiment, the graphical user interface of the navigation device **200** can be operated in one of two modes:

[**0067**] ADVANCED mode, which offers access to all buttons and features and concepts as presented in FIGS. **3***a*-**3***c* and **4***a*-**4***g*. Alternatively, advanced mode may be referred to as full mode.

[**0068**] NORMAL mode, which is actually a vastly simplified mode that hides a lot of features from the user as illustrated in FIGS. **5***a*, **5***b*, and **6***a*, **6***b*, **6***c*. It is sometimes referred to as "simplified mode" or "non-advanced mode".

[**0069**] In NORMAL mode, the number of menu options is reduced to 10 instead of 15 and thus the menu is reduced to two pages instead of three. In other embodiments, different menu structures and different number of menu items can be implemented. A new owner of a navigation device **200** or even the average user might not be interested in all the advanced features therefore such a vastly simplified menu system would enhance their overall user experience and ease of use, thereby also increasing safety on the road.

[**0070**] Using switch button **305**, the user may switch to a simplified menu layout, wherein the user have access to much fewer functions, services and configuration options. It is also possible that the number of functions, services and configuration options remains the same as long as the features associated with the advanced mode are located on higher page numbers and features associated with normal mode are prioritized (shown first). In an alternative embodiment, advanced options are moved backwards in the menu pages, presenting basic functions and services and configu-

ration options on lower page numbers, such as page 1 and 2 for example, and advanced features on later pages.

[0071] When combining menu panes to fit fewer pages, the location of menu items within the menu is similar in the NORMAL and the ADVANCED layouts as well. So, for instance, users can expect the "Add Favourite" option to be in the bottom left corner of a menu regardless of the mode used.

[0072] Therefore, layout of the menu items on the first menu page might be identical in both NORMAL and ADVANCED modes. This is illustrated in FIG. **3***a* containing the same menu items **301** as FIG. **5***a;* and also FIG. **4***a* containing the same menu items **301** as FIG. **6***a*. Such "fixed position" menu items **301** are considered the most basic functions of the navigation device **200** and hence the user should find them on the same place regardless of which menu mode is used.

[0073] In NORMAL mode, the behavior of certain features can be simplified as well by showing fewer buttons, fewer options, and fewer submenus, wherever possible, making it less confusing for a new user to use the various functions of the navigation device **200** and also reducing the risk of unintended configuration changes.

[0074] The preference setting (switch button **305**) can be used to turn advanced features on or off. The icon can be located at the end of the preference menu as shown in FIGS. **4***g* and **6***c*.

[0075] The navigation device **200** is configured to suggest switching to normal, i.e. non-advanced mode when certain conditions are met. The very first time the navigation device **200** is switched on (or after a reset or software upgrade), when the start-up procedure is completed and then again on the fifth on/off event, if advanced menu is still switched on, the user gets a suggestion to turn the advanced features off. A tip or dialog may be displayed advising the user that the menu contains many advanced features and seldom-used options. The navigation device **200** may offer a selection screen to change the menu layout immediately or it may indicate how the user can change the menu layout manually.

Currently, your menu is full of
"advanced" features and seldom-used options.
Would you like to turn off all those features?
(You can always turn them back on when needed).

[0076] In another embodiment, the menu layout is changed automatically, when the navigation device **200** has determined that some of the menu items **301** (and which ones) are not used frequently or haven't been used at all. Another screen tip may advise the user how to turn on all features and options that are currently hidden or disabled.

[0077] If the user of the navigation device **200** manually switches to non-advanced mode, an additional warning is given to make sure the user understand what kind of changes are made to the user interface and how to revert to full mode. Switching between normal and advanced mode is preferably an option in the preferences or setup menu of the navigation device **200**. In one embodiment, this option is located on the last page of the preferences menu.

[0078] Besides menu changes, there might be further effects when switching to non-advanced mode. The setting mostly affects the menus by removing (i.e. disabling and hiding) a lot of icons.

[0079] The other effects of changing to non-advanced mode might include the following:

[0080] Some buttons, options, and submenus might be removed in the non-advanced mode. For example, "delete" button might be removed from various functions such as the voice selector and map selector.

[0081] The ROUTE/POSITION button might be removed from all Points Of Interest (POI) lists, allowing any POI result list to be sorted by distance to the current route. An explicit "POI along route" option might be available besides this feature to allow some of the more advanced tasks in the non-advanced mode as well.

[0082] Furthermore, in the non-advanced mode, certain HELP icons might be hidden.

[0083] It is also possible to dim SWITCH MAP if there's only one map

[0084] The navigation device **200** might also hide all voices except those in the current language and those that were plugged in (and the current voice if it is in another language).

[0085] The Main Menu

[0086] Preferably, in non-advanced mode, a whole page of main menu options is left out thereby reducing the total required menu space for accessing the functions and options of the navigation device **200**. The total number of menu pages is thus decreased by at least one page. In one implementation, the non-advanced (i.e. normal) mode uses two menu pages compared to three pages in the advanced mode.

[0087] Further options that are disabled in the non-advanced mode might include:

[0088] VIEW ROUTE, which is offering access to route instructions, route images, the route demo etc. Optionally, this feature might be available from the route summary or other locations instead of the main menu;

[0089] TOMTOM WEATHER, which might be removed (disabled) completely or moved to a different location, for example the "PLUS services" submenu;

[0090] ITINERARY PLANNING, which might be removed from the non-advanced mode;

[0091] CLEAR ROUTE might be also removed because the user can always overwrite the current route by planning a new route. This is a minor sacrifice to save a menu page;

[0092] GUIDED TOUR might be completely removed from the non-advanced mode, or alternatively, it might present information about the functionalities available in the current mode.

[0093] The following menu options are preferably kept in both normal and advanced mode:

[0094] ADVANCED PLANNING to plan from A to B (instead of from current location to B). This option also

allows planning a route according to various preferences that might not be available in the normal mode. These preferences might include planning one of a fastest, shortest, less congested, most cost efficient, or most fuel efficient route;

[0095] BROWSE MAP, which is considered a core feature of the navigation device **200**;

[0096] PLUS SERVICES to access various services like weather, speed cameras, traffic information, messaging, etc;

[0097] ADD FAVOURITE to make it easier for the user to enter frequently visited destinations by saving them as a favourite;

[0098] MULTIMEDIA PLAYER to allow convenient playback of audio, image and video files.

[0099] In other embodiments, different or additional menu options might be common in the menu layout of the normal an advanced operation mode.

[0100] If the navigation device **200** supports hands-free call capabilities, the option might be available in both normal and advanced modes; or alternatively, the normal mode might display hands-free related options only when a mobile telephone is connected to the navigation device **200**.

[0101] On a navigation device **200** that does not support making of hands-free calls, but supports Bluetooth wireless connectivity, it is possible display a CONNECT TO YOUR PHONE option instead of the PHONE menu, and also to swap ADD FAVOURITE and CONNECT TO YOUR PHONE.

[0102] On a navigation device **200** that does not support hands-free calls nor Bluetooth wireless connectivity, functions requiring sending and/or receiving data from external device might be disabled (disabled items **304**) or hidden. Such functions might include TRAFFIC, PHONE and PLUS SERVICES, among others.

[0103] The Preferences Menu

[0104] In non-advanced mode, also many preference options can be left out. It is important to note that care has been taken to keep the location within the menu similar to the advanced lay-out. So, for instance, users expect the voice selector in the bottom left corner of a menu thus the placement of this option is identical in both advanced and normal modes as illustrated in FIGS. **4***d* and **6***b*, respectively.

[0105] In this embodiment, the first preference page remains unchanged, displaying the nightview, 2D view, saftey view, visible POI, sound on/off options as shown in FIGS. **4***a* and **6***a*. The user of the navigation device **200** thus always finds these frequently used functions at the same location. The other six preference pages (FIGS. **4***b* to **4***g*) are reduced to two preference pages (FIGS. **6***b* and **6***c*) in a way that most menu items **301** maintain their location.

[0106] The following menu items can be changed or removed from the normal mode. MANAGE MAPS can be replaced with SWITCH MAP (also removing the DELETE MAP option);

[0107] MANAGE POI, which provides access to all self-made POI features, is replaced with just the POI WARNER option;

[0108] Further ADVANCED FEATURES can be removed, e.g. for changing the day/night brightness, screen rotation, map colors, and fields that are displayed.

[0109] Note that "Plan A-to-B" will offer planning types (shortest, bicycle etc.). SET UNITS and LEFT-/RIGHT-HANDED options might be removed as they are demanded in the startup wizard.

[0110] The following is a brief description of menu items that might be kept in the simplified preferences menu in one embodiment of the invention.

[0111] It is important that the user can setup and edit his or her service account even in simplified mode. Service accounts define what services and contents the user has subscribed for and related connection preferences.

[0112] Another menu option is for setting volume and audio preferences, which might be accessible from the navigation screen as well, but this is considered to be a very important setup option.

[0113] Maintaining favourites is possible in both normal and advanced modes. Creating, editing, deleting or renaming favourites is important, since favourites are the locations most frequently visited by the user of the navigation device. The user is also able to set or change a home location, which might be implemented as a separate menu item.

[0114] The user can select a preferred voice for spoken navigation instructions in the preferences menu. This, and selection of language are very important options and hence they are available in advanced and simplified modes as well.

[0115] In simplified mode, the user may still use the POI-warner functionality, which is required for example for reminding the driver about legal speed limits and POIs on the route. The options to create self-made POI might be removed, but at least the capability to enable or disable downloaded speed camera warnings is preferable available in the simplified mode.

[0116] The user of the navigation device may change a number of other options that might e.g. date and time, selection of a map, login to online services, and most importantly to switch between normal and advanced modes.

[0117] In different embodiments, an additional number of features are possible in the simplified mode of the navigation device, the features might include:

[0118] selection of left/right handed operation, in case a right-handed person shares the navigation device with a left-handed person, and they need to switch back and forth frequently,

[0119] brightness setting,

[0120] changing map colors, which might be needed when sharing the navigation device with someone who has different personal preferences (or is colorblind),

[0121] switching Bluetooth on/off, which might be needed e.g. on an airplane,

[0122] showing information about the software and installed maps.

[0123] Simplified Menu

[0124] When first switched on, the navigation device **200** displays the simplified menu structure by default. In this mode, all advanced options are hidden from the user, both in the main menu and preferences menu as illustrated in FIGS. **5***a*, **5***b*, **6***a*, **6***b*, **6***c*, respectively.

[0125] If the user selects the "Show ALL menu options" switch button **305** (FIG. **6***c*), the menu is switched from simplified mode to full mode. The navigation device returns to the navigation screen and may display a flash message (e.g. in the top right corner of the screen) stating "More options and features are now available".

[0126] In one embodiment, if the user opens the third page of the preferences menu (FIG. **6***c*) for the fifth time, and has not yet selected the "Show ALL menu options" switch button **305**, a tip may be displayed, explaining that there is an advanced menu layout that offers access to all features and functions of the navigation device **200**. The same tip might be displayed again if the user opens the third page of the preferences menu (FIG. **6***c*) for the twenty-fifth time, and again on the seventy-fifth time (but preferably only if the user has never selected the "Show ALL menu options" switch button **305**.

[0127] Full Menu

[0128] Once the user has enabled the full menu (ADVANCED mode), more menu options are made available in both the main menu and the preferences menu, as indicated on FIGS. **3***a*-**3***c* and **4***a*-**4***g*.

[0129] If the user selects switch button **305**"Show fewer menu options" (FIG. **4***g*), the menu is switched from "Advanced mode" to "Normal mode". The navigation device returns to the navigation screen and may display a flash message (e.g. in the top right corner of the screen) stating "Many options and features are now hidden".

[0130] It is to be noted that the label and location of switch button **305** can be different from the above examples. A skilled person can make several changes to the above embodiment within the scope of the appended claims.

[0131] It is possible for example that several people use the same navigation device **200**, who may set their preferred menu layout individually. It is possible that the navigation device **200** stores these individual user preferences and retrieves them at startup or during operation of the navigation device. Users of the navigation device may select their name and give their individual pin code to retrieve their preferred menu layout. It is also possible that only the owner of the navigation device is able to access the advanced mode containing all features and services of the navigation device and other users may access only the basic, non-advanced mode with a vastly reduced functionality. The advanced mode may require entering a pin code, while the basic mode may be accessible anytime.

[0132] Safety Lock

[0133] FIG. **7***a* is a screenshot from a navigation device implementing another embodiment of the invention. In this case, the non-advanced mode is implemented as a special safety lock feature, e.g. a simplified user interface design for navigation devices while the vehicle is moving. The safety lock view is intended to show a single page that offers the six most useful option (menu items **301**) that are needed while actually driving, in as safe a way as possible.

[0134] Preferably, the main menu might comprises up to six menu items **301**, that are in this example "Navigate To", "Alternative route", "Nightview", "Mobile Phone", "Sound on/off", and "Jukebox".

[0135] The navigation device **200** may display a notification (status indicator **306**) when the safety lock is enabled. It is also possible that next button **302** is replaced by an additional menu item **301**.

[0136] FIG. **7***b* shows a screenshot of a further alternative of the above embodiment. When simplified mode is on, both the status and title bars might be removed from the bottom and top of the screen (including done button **303** and status indicator **306**), so that the resulting one page (safety) menu comprises four (or six) menu items **301**. An example with four menu items (**301**, **304**) is illustrated on FIG. **7***b*, although any different number of basic functions can be used.

[0137] Menu item **301** labeled "Turn off map display" (FIGS. **4***a* and **6***a*), which is actually seen as a safety feature, might be replaced with a "Safety Lock" icon (not shown). The "Safety Lock" icon might be a separate icon in the setup or preferences menu. When selecting the "Safety Lock" icon, the user can enable/disable the safety lock. The user may specify a speed, above which safety lock is activated or whether the safety lock, i.e. non-advanced mode is enabled or disabled permanently.

[0138] In another embodiment, the safety lock is activated when several conditions are met, for example, when the device is docked and there is a GPS fix (i.e. valid GPS signal) and the current measured GPS speed is above 8 km/h (which might be a factory preset value).

[0139] FIG. **8** is a flowchart illustrating an embodiment of the invention. The user of the navigation device **200** can select between NORMAL and ADVANCED modes and may configure various layout options in step **801**. This step might be part of the initial setup when the navigation device **200** is taken into use at the first time, it might be a factory preset, or it might be an option in the configuration or setup or preferences menu of the navigation device. It might be a simple switch between layout modes or it might allow setting up further conditions for any supported menu modes or layouts.

[0140] The navigation device **200** is normally operated in a navigation view represented by box **802**. By pressing an appropriate button on the navigation device **200** (e.g. a dedicated area on a touch screen), the user can select the menu screen at step **803** for displaying various features and services of the navigation device **200**. As mentioned before, layout options can be changed or configured (**801**) by the user, and this is usually done through a menu screen, as an option among many supported features and services.

[0141] Once the user has selected the menu screen at step **803**, the processor **210** will determine whether the layout switch option is activated at step **804**. If the processor determines that the user has not selected a simplified mode, a first layout is used (step **805**) and menu items will be presented according to the first layout.

[0142] In case the processor determines at step **804** that a switch option has been activated, it will proceed to step **806** by displaying a second menu layout, which might comprise a simplified menu structure and reduced functionalities. Such a simplified mode might be selected manually at configuration options (step **801**) or might be a factory preset, or might include other parameters, such as at least one of a specific speed, an availability of a GPS signal, and connection of the navigation device to a vehicle docking unit, which options might be configured in step **801**.

[0143] Either using a first or a second menu layout (**805**, **806**), the user can access to the configuration option (**801**) from the main menu or one of its sub-menus or from a separate menu. By setting changing or configuring layout options, the user may directly switch between the first and second layouts (**805**, **806**). At step **807**, the navigation device exits to the navigation screen and hence returns to step **802**.

[0144] FIG. **9** is a three-dimensional view of a navigation device **901** attached to its docking station **903**. The navigation device **901** has a touch sensitive screen **902** showing navigation related information (in this example), which is usually the default view while driving. When the user selects the menu button, which might be either a hard button or a software button (not shown, in this example, it is actually a hidden button in the center of the touch sensitive screen **902**), the touch sensitive screen **902** displays the menus according to various embodiments of the invention (shown in FIGS. **3***a*-**7***b*).

[0145] The invention has been described with reference to certain preferred embodiments. It will be understood, however, that modifications and variations are possible within the scope of the appended claims.

1. A method for displaying menu items on a navigation device, the method comprising the steps of:

presenting a navigation screen showing a map display and information elements related to an area surrounding the navigation device,

accessing a menu comprising multiple pages via touching a touch sensitive screen at a pre-defined area,

storing an arrangement of menu items in at least a first and a second layouts,

displaying a menu option in at least one of said at least first and second layouts, the menu option allowing the device to switch between said first and second layouts,

determining whether said menu option is in an activated state, and

displaying said menu using said first layout if said menu option is in a de-activated state, and displaying said menu using said second layout when said menu option is in an activated state.

2. A method according to claim 1, wherein said second layout comprises fewer menu items than said first layout.

3. A method according to claim 1, wherein said menu option enables monitoring usage of the navigation device in at least one of said first and second layouts.

4. A method according to claim 3, wherein said monitoring of usage comprises calculating at least one of an elapsed time since the navigation device was first used, an elapsed time since the navigation device was last used, a total number of times the navigation device was used, a total number of on/off cycles of the navigation device, an elapsed time since at least menu item was last used, a total number of times at least one menu item was used, and a current speed of the navigation device.

5. A method according to claim 4, further comprising the step of displaying a dialog to the user to change and/or advising the user to change between said at least first and second layouts when at least one of said counted navigation device parameters reaches a threshold.

6. A method according to claim 1, wherein said menu option allows manual selection between said first and second layouts.

7. A method according to claim 1, wherein said second layout is formed as a sub-set of said first layout by removing and/or disabling and/or replacing and/or moving at least one menu item of said first layout.

8. A method according to claim 1, wherein said second layout is formed by increasing the number of said menu items per page.

9. A method according to claim 1, wherein said second layout comprises simplified menu items and/or simplified functionalities.

10. A method according to claim 1, wherein said activated state is a function of speed.

11. A method according to claim 1, wherein said at least first and second layouts are defined as a factory preset.

12. A method according to claim 1, wherein said at least first and second layouts are defined by the user of the navigation device.

13. A method according to claim 1, wherein said at least first layout is called advanced or full mode and said second layout is called normal or minimized or safety mode.

14. A navigation device comprising,

a display for presenting a navigation screen with a map and information elements related to an area surrounding the navigation device,

means for accessing a menu comprising multiple pages via touching a touch sensitive screen at a pre-defined area,

means for storing an arrangement of menu items in at least a first and a second layouts,

means for displaying a menu option in at least one of said at least first and second layouts, the menu option allowing the device to switch between said first and second layouts,

means for determining whether said menu option is in an activated state, and

means for displaying said menu using said first layout if said menu option is in a de-activated state, and displaying said menu using said second layout when said menu option is in an activated state.

15. A navigation device according to claim 14, wherein said second layout comprises fewer menu items than said first layout.

16. A navigation device according to claim 14, wherein said menu option enables monitoring usage of the navigation device in at least one of said first and second layouts.

17. A navigation device according to claim 16, wherein said monitoring of usage comprises calculating at least one of an elapsed time since the navigation device was first used, an elapsed time since the navigation device was last used, a total number of times the navigation device was used, a total number of on/off cycles of the navigation device, an elapsed time since at least menu item was last used, a total number of times at least one menu item was used, and a current speed of the navigation device.

18. A navigation device according to claim 17, further comprising means for displaying a dialog to the user to change and/or advising the user to change between said at least first and second layouts when at least one of said counted navigation device parameters reaches a threshold.

19. A navigation device according to claim 14, wherein said menu option allows manual selection between said first and second layouts.

20. A navigation device according to claim 14, wherein said second layout is formed as a sub-set of said first layout by removing and/or disabling and/or replacing and/or moving at least one menu item of said first layout.

21. A navigation device according to claim 14, wherein said second layout is formed by increasing the number of said menu items per page.

22. A navigation device according to claim 14, wherein said second layout comprises simplified menu items and/or simplified functionalities.

23. A navigation device according to claim 14, wherein said activated state is a function of speed.

24. A navigation device according to claim 14, wherein said at least first and second layouts are defined as a factory preset.

25. A navigation device according to claim 14, wherein said at least first and second layouts are defined by the user of the navigation device.

26. A navigation device according to claim 14, wherein said at least first layout is called advanced or full mode and said second layout is called normal or minimized or safety mode.

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