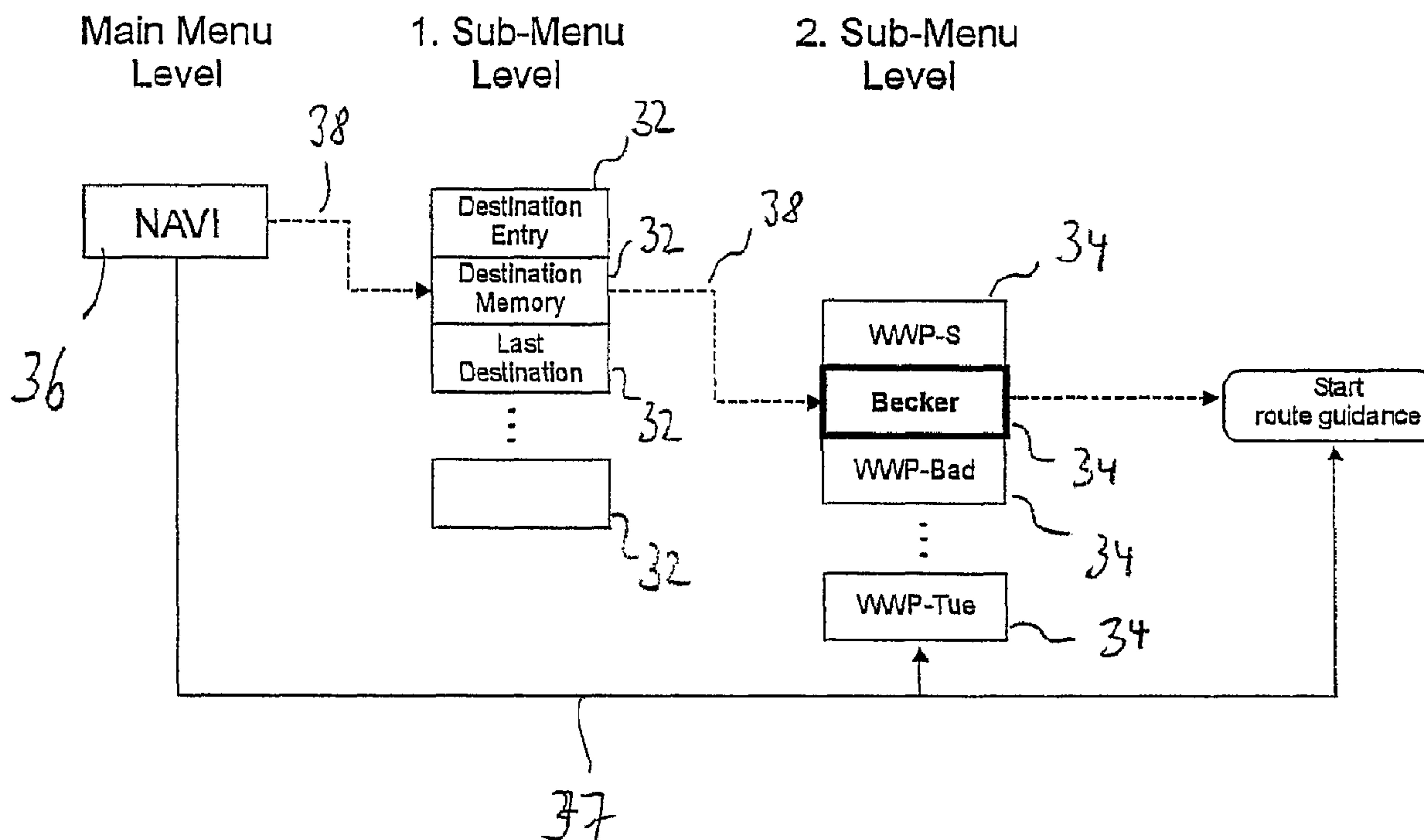




(86) Date de dépôt PCT/PCT Filing Date: 2005/04/29
(87) Date publication PCT/PCT Publication Date: 2005/11/10
(45) Date de délivrance/Issue Date: 2010/07/13
(85) Entrée phase nationale/National Entry: 2006/09/15
(86) N° demande PCT/PCT Application No.: EP 2005/004632
(87) N° publication PCT/PCT Publication No.: 2005/106394
(30) Priorité/Priority: 2004/04/30 (EP04010243.6)

(51) Cl.Int./Int.Cl. *G01C 21/36* (2006.01)
(72) Inventeurs/Inventors:
PREISSNER, OLAF, DE;
GEIGER, ERICH, DE;
ROSSGER, PETER, DE
(73) Propriétaire/Owner:
HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH,
DE
(74) Agent: OYEN WIGGS GREEN & MUTALA LLP

(54) Titre : SYSTEME MULTIMEDIA DE VEHICULE ET PROCEDE PERMETTANT D'ACTIVER UNE FONCTION D'UN SYSTEME MULTIMEDIA DE VEHICULE
(54) Title: CAR MULTIMEDIA SYSTEM AND METHOD FOR ACTIVATING A FUNCTION OF A CAR MULTIMEDIA SYSTEM



(57) Abrégé/Abstract:

The present invention relates to a car multimedia system comprising an audio unit, a navigation unit for route guidance, a controller device for controlling said units, a display for displaying selection menus with hierarchically structured menu items and end-menu items, said end-menu items allowing to start a specific function, and a selection key unit comprising at least a push button switch, preferably a hard key, a two way switch, preferably a rotary knob, for selecting and a push button switch for activating menu items and end menu items. It further comprises a discriminating device (80) adapted to select an end-menu item (34) in response to an actuation of said push button switch (18), preferably said hard key, said end-menu item (34) being selected by said discriminating device (80) on the basis of a predetermined criterion.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
10 November 2005 (10.11.2005)

PCT

(10) International Publication Number
WO 2005/106394 A1

(51) International Patent Classification⁷: **G01C 21/36**

(21) International Application Number:

PCT/EP2005/004632

(22) International Filing Date: 29 April 2005 (29.04.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

04010243.6 30 April 2004 (30.04.2004) EP

(71) Applicant (for all designated States except US): **HARMAN/BECKER AUTOMOTIVE SYSTEMS GMBH** [DE/DE]; Becker-Goering-Str. 16, 76307 Karlsbad (DE).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **PREISSNER, Olaf** [DE/DE]; Hohentwielstrasse 33, 70199 Stuttgart (DE). **GEIGER, Erich** [DE/DE]; Altenbergweg 11, 75236 Kaempfelbach (DE). **RÖSSGER, Peter** [DE/DE]; Bertha-von-Suttner-Strasse 21, 72631 Aichtal (DE).

(74) Agents: **LINDNER, Michael** et al.; Witte, Weller & Partner, Postfach 105462, 70047 Stuttgart (DE).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

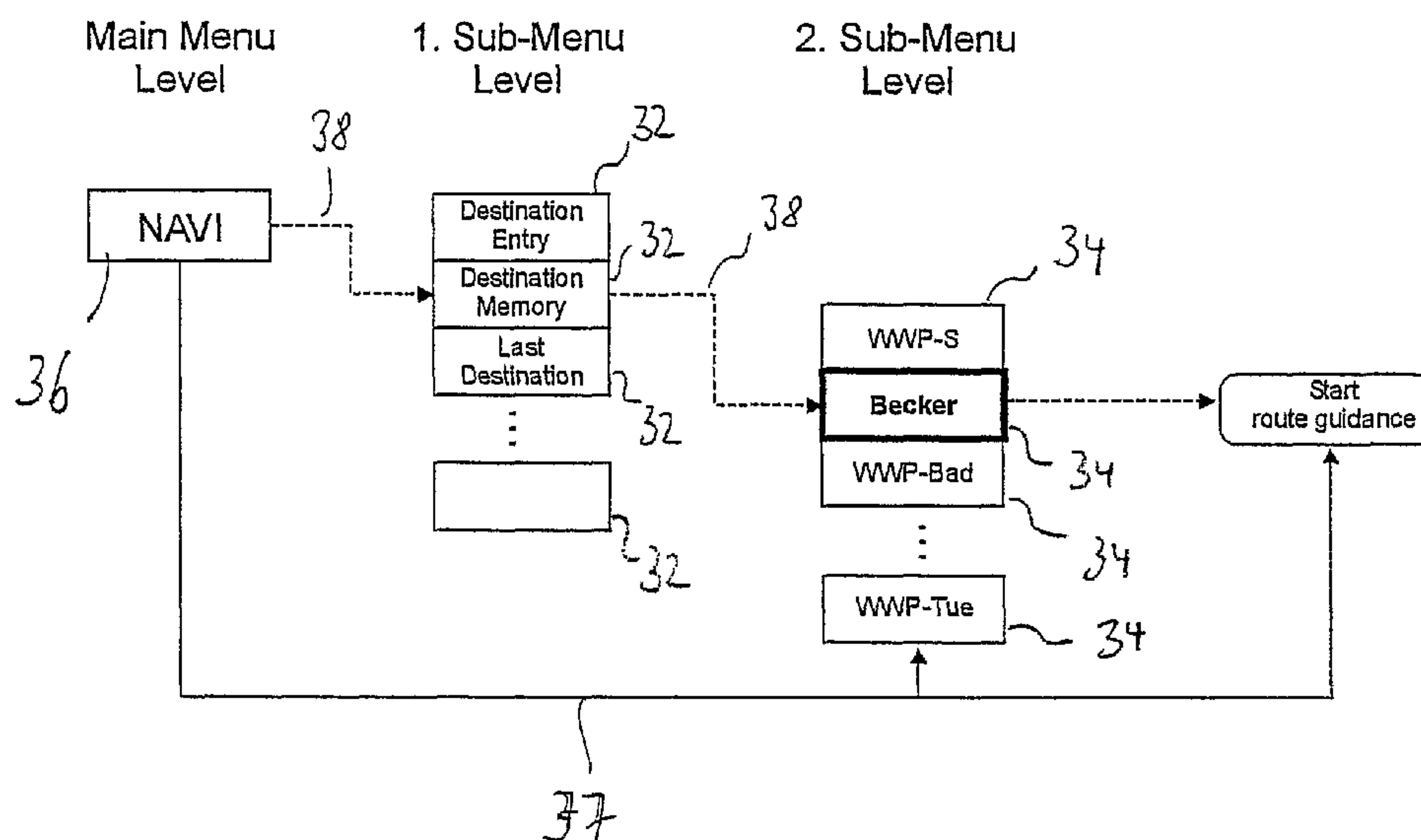
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

[Continued on next page]

(54) Title: CAR MULTIMEDIA SYSTEM AND METHOD FOR ACTIVATING A FUNCTION OF A CAR MULTIMEDIA SYSTEM



(57) Abstract: The present invention relates to a car multimedia system comprising an audio unit, a navigation unit for route guidance, a controller device for controlling said units, a display for displaying selection menus with hierarchically structured menu items and end-menu items, said end-menu items allowing to start a specific function, and a selection key unit comprising at least a push button switch, preferably a hard key, a two way switch, preferably a rotary knob, for selecting and a push button switch for activating menu items and end menu items. It further comprises a discriminating device (80) adapted to select an end-menu item (34) in response to an actuation of said push button switch (18), preferably said hard key, said endmenu item (34) being selected by said discriminating device (80) on the basis of a predetermined criterion.

WO 2005/106394 A1

WO 2005/106394 A1



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Car Multimedia System and Method for Activating a Function of a
Car Multimedia System

The present invention relates to a car multimedia system comprising an audio unit, a navigation unit for route guidance, a controller device for controlling said units, a display for displaying selection menus with hierarchically structured menu items and end-menu items, said end-menu items allowing to start a specific function, and a selection key unit comprising at least a push button switch, preferably a hard key, a two way control, preferably a rotary knob, for selecting and a push button switch for activating menu items and end-menu items. The

invention also relates to a method for activating a function of such a car multimedia system.

Such car multimedia systems are known. The applicant of the present invention for example offers a plurality of different types of car multimedia systems under the brand name "Becker". All of these systems have in common that they are designed to fit into standardized installation slots, in the dashboard of a car. Due to such space requirement the dimensions of a front panel of the car multi media system are limited. Therefore, the front panel of the car multimedia system carries only a minimum number of selection keys, like hard keys and soft keys, one or two rotary push button switches and a display for displaying information and selection menus. The hard keys are assigned a predetermined function, whereas the soft keys are assigned variable functions to be selected.

Since car multimedia systems offer a plurality of different functions, including audio functions like radio or CD, navigation functions like route guidance, or telecommunication functions, like telephone, e-mail, SMS or WAP, a hierarchically structured menu system allows to select these functions by using some few hard keys, soft keys and the rotary push button switch.

As generally known, a hierarchically structured menu system comprises a root menu item in a main menu level and a plurality of menu items in one or more sub-menu levels. In the context of the present invention each menu item in the lowest sub-menu level is called end-menu item.

The display of the car multimedia system serves to display menu items which may be selected by rotating the rotary push button and activated by pushing it.

Due to the increasing number of functions offered by present car multimedia systems, the number of menu items as well as the number of sub-menu levels rapidly increases with the result that the user of the car multimedia system has to pass through many sub-menu levels as to reach the desired end-menu item. Hence, this selection takes more time than just to push a hard or soft key with the result that the users attention is focused on the car multimedia system for a "relatively long period" rather than on the traffic. This may lead to dangerous situations.

In view of the above it is an object of the present invention to provide a car multimedia system of the afore mentioned kind which allows to select and activate functions in a faster way as to minimize the period within which the user focuses his attention to the car multimedia system.

This object is solved by the car multimedia system of the afore mentioned kind which comprises a discriminating device adapted to select an end-menu item in response to an actuation of said switch, preferably said hard key, said end-menu item being selected by said discriminating device on the basis of a predetermined criterion.

That is in other words that the discriminating device shortens the selection process, i.e. the selection of an end-menu item, to a single touch of a switch. Hence, all sub-levels and menu

items between the root menu item and the end-menu item are skipped. The discriminating device selects the end-menu item on the basis of a predetermined criterion which may be preset by the user or which is preset by the system.

The user has only to confirm the selection of the discriminating device by pushing the rotary push button switch thus activating this end-menu item.

It is apparent that the discriminating device allows to shorten the period necessary for selecting and activating a specific function (assigned to an end-menu item) and hence to keep the time during which the users attention is focused on the operation of the car multimedia system, is kept on a minimum.

In a preferred embodiment said discriminating device is adapted both to select and activate said and menu item.

This is in other words that the user is relieved from activating the selected end-menu item by pushing the rotary push button switch. Instead, the discriminating device fulfils this task and also activates the selected end-menu item.

This measure has the advantage that the period for selecting and activating a function is further reduced and therewith the users distraction from traffic.

In a further preferred embodiment, said criterion is the number of former selections of the end-menu items assigned to said switch, preferably said hard key. Preferably said discriminat-

ing device is adapted to select the end-menu item with the largest number of former selections.

That is in other words that the discriminating device selects those end-menu item which has been used by the user most frequently before. Thus, the discriminating device determines a favourite out of the end-menu items belonging to a common root menu item which is selected and activated by a hard key.

These measures result in improved ergonomics and take the usual behaviour of the user into account. The inventors of the present invention have found out that despite the plurality of selectable functions users of car multimedia systems generally use only a few number of functions in practise.

In a preferred embodiment, a data memory for storing data packets each being assigned to an end-menu item is provided, wherein each data packet carries the number of selections of the assigned end-menu item. Preferably, each data packet further carries the date of last use of the assigned end-menu item. Most preferably, said data memory stores at least two data packets for each assigned end-menu item.

These measures implement a data structure which allows to build up lists of favourite end-menu items. These end-menu item lists are managed by the discriminating device and serves to further increase the ergonomics of the whole system. Particularly, the implementation and maintenance of such lists allow to better react on the requests of the user.

In a preferred embodiment, said discriminating device is adapted to allow the selection of menu items according to the hierarchical structure by using the rotary push button (override mode). Preferably, said override mode is activated by a double activation of said hard key.

That is in other words that the user may "switch off" the discriminating device so that the normal selection and activation of an end-menu item by passing through the menu hierarchy is possible. Since this override mode may be selected by pushing the hard key twice, the user is not distracted by searching another hard or soft key on the front panel of the car multimedia system for selecting this mode.

In a preferred embodiment said controller device is adapted to delete said data packets assigned to at least one of said end-menu items in response to a predetermined input via said selection key unit.

That is in other words that the user may delete at least one member of the favourites list. This measure has the advantage that the system may further be adapted to the users requests.

In a further preferred embodiment, said control device is adapted to allow the selection of a criterion out of a predetermined list of criteria via said selection key unit.

This is in other words that the user is allowed to determine the criterion which is the basis for the discriminating device to select an end-menu item. As already mentioned, the preferred

criterion is the frequency of use of end-menu items. However, other criteria are also conceivable.

This measure allows to further adapt the system to the users requests and demands.

In a preferred embodiment, a telecommunications unit comprising a telephone module and an internet module allowing e-mail, SMS transmission, WAP and other telecommunication services is provided. Further, that audio unit comprises a radio module and a CD module.

The present invention is particularly useful if the car multimedia system offers a plurality of different functions.

As already mentioned before, the selection and activation of menu items is made by said rotary push button switch. However, it is apparent for a skilled person that the rotary push button switch may be provided as two single units, namely a rotary knob and a push button switch instead of a single unit integrating both. Moreover, the rotary switch may be replaced with a two-way switch or a four-way switch, as well.

In a preferred embodiment said hard key is provided for activating the navigation unit.

Due to the fact that the navigation unit offers a plurality of functions with the respective plurality of menu items, the present invention is particularly useful.

However, it is apparent that further hard keys may be provided for activating other units, like the audio unit, the telecommunications unit, etc. Each hard key is assigned a hierarchically structured menu with menu items and end-menu items. For each hierarchically structured menu, at least one favourite end-menu item is stored and selected by the discriminating device in response to the activation of the respective hard key.

The object of the present invention is also solved by a method for activating a function of said car multimedia system, the method comprising the step of selecting an end-menu item in response to an actuation of said hard key, wherein said end-menu item is selected on the basis of predetermined criterion.

This method achieves the same advantages as the inventive car multimedia system as described above so that it is referred to the respective description.

In a preferred embodiment, said end-menu item is both selected and activated in response to said actuation of said hard key.

Preferably, said criterion is the number of former selections of said end-menu items assigned to said hard key.

It is also preferred that the end-menu item with the greatest number of selections is selected. Preferably, a counter value assigned to said end-menu item is increased by one with each selection of an end-menu item. Further, an actual date of use is stored for an end-menu item with each selection of said end-menu item.

Preferably, the selection and activation of menu items according to the hierarchical structure is allowed (override mode) in response to a predetermined operation of said selection unit, preferably a double actuation of said hard key.

Preferably, said counter values may be deleted either separately or in common via said selection key unit.

In the above it has been described that said discriminating device selects an end-menu item in response to an actuation of said hard key. However, it is to be understood that the discriminating device may also be adapted to select an end-menu item in response to an actuation of a soft key or any other switch of the car multimedia system.

Further features and advantages can be taken from the following description and the enclosed drawings.

It is to be understood that the features mentioned above and those yet to be explained below can be used not only in the respective combinations indicated, but also in other combinations or in isolation, without leaving the scope of the present invention.

An embodiment of the invention is shown in the drawings and will be explained in more detail in the description below with reference to same. In the drawings:

Figure 1 shows the front panel of a car multimedia system according to the present invention;

Figure 2 shows an example of a hierarchically structured menu;

Figure 3 is a schematic block diagram of the car multimedia system; and

Figure 4 is a block diagram illustrating an example of a data structure used by the car multimedia system.

In Figure 1 a front panel 12 of a car multimedia system 10 is schematically shown. The car multimedia system 10 is designed as a device which fits into the standardized installation slot in the dashboard of a vehicle. In addition to the device disposed in the dashboard a further device is placed within the vehicle, for example in the glove compartment. This second device is the so called GSM/GPS box offering navigation and telecommunication services. The GSM/GPS box is electrically connected with the device in the dashboard (both devices defining the car multimedia system 10).

Both devices have a plurality of connectors allowing to connect necessary hardware, like ear-phone, GSM antenna, GPS antenna, hands free microphone, radio antenna, loud speaker, etc. For the sake of simplicity, these parts are not shown in Figure 1.

The car multimedia system offers a plurality of different functions and services, for example radio, navigation, telephone, e-mail, SMS, etc. All these functions and services may be selected by a user of the car multimedia system 10 via the front panel 12.

The front panel 12 comprises a first rotary push button switch 14 which allows to control the volume by rotating the rotary push button 14 and to switch on and off the car multimedia system 10 by pushing the rotary push button switch 14. The rotary push button switch 14 is placed on the left hand side of the front panel 12. On the right hand side a second rotary push button 16 is provided which allows to select a menu item by rotating and to activate it by pushing the rotary push button switch 16.

Further selection keys in form of push button switches are provided in the upper front panel area. Three of these selection keys are referenced with reference numeral 18a, 18b and 18c. The selection keys 18 serve to select a predetermined function of the car multimedia system 10, in the present case the CD function with selection key 18a, the radio function with selection key 18b and the navigation function with selection key 18c. Generally such selection keys provided for selecting one specific function are called "hard keys".

In addition to these hard keys, the front panel 12 also carries so called soft keys 20. These soft keys serve to select variable functions depending on the on mode in which the car multimedia system is operated. In the present embodiment, ten soft keys are provided in the lower margin area of the front panel 12.

In the centre of the front panel 12, a display 22 is disposed. In the present embodiment, the display 22 is a DOT matrix display, which allows to display several lines of information in form of characters, words or pictures, icons or pictograms.

In Figure 1, the display 22 displays three lines of information in form of three different menu items 24a, 24b and 24c. The menu item shown in the middle line 24b is displayed in a larger font compared to the information shown in the first and the third line 24a, 24c. The larger font indicates that the menu item in line 24b is selected.

Further, the display 22 displays two arrows 26a, 26b, the upper arrow 26a being directed upwards and the lower arrow 26b being directed downwards. Both arrows indicate that more menu items than displayed are reachable.

The user may select a menu item by rotating the rotary push button 16 until the desired menu item is displayed in the middle line 24b. In order to activate this selected menu item, the user then has to push the rotary push button 16. Depending on the selected and activated menu item, either further menu items are displayed or the desired function is started.

Although the use of hierarchically structured menus is known, an exemplary menu is shown in Figure 2 and will be explained below for better understanding of the present invention. Particularly, Figure 2 illustrates a part of the hierarchically structured menu for operation of the navigation system being part of the car multimedia system 10.

In general, the menu comprises a plurality of menu items 32 in a first sub-menu level and a plurality of menu items 34 in a second sub-menu level. All shown menu items 32, 34 belong to one main menu item 36 (root menu item) of the main menu level.

In the present embodiment, the first sub-menu level comprises the menu items "destination entry", "destination memory" and "last destination", which belong to the menu of the navigation system of the car multimedia system 10. The first sub-menu level, that is the menu items 32 are reached by selecting and activating the main menu item 36. This is achieved for example by pushing the hard key 18c.

The menu items 34 of the second sub-menu level belong to a specific menu item of the first sub-menu level, in the present embodiment the menu item "destination memory". In order to reach the menu items 34 of the second sub-menu level, the menu item "destination memory" of the first sub-menu level has to be selected and activated via the rotary push button switch 16.

For sake of simplicity, the other menu items of the second sub-menu level belonging to the menu items "destination entry" and "last destination" of the first sub-menu level are not shown.

As it is apparent from Figure 2, the second sub-menu level defines the last or lowest menu level, which means that by selecting and activating a menu item 34 of this sub-menu level, a function is started instead of displaying further menu items. Therefore, the menu items of this second sub-menu level are called hereinafter "end-menu items".

In the embodiment shown, the end-menu item "Becker" is selected and activated as to start route guidance to the address associated and stored with the name "Becker".

It is to be understood that this hierarchically structured menu is more illustrative and may be modified by providing more menu items in more than two sub-menu levels.

From the above description it may be seen that for selecting and activating the end-menu item "Becker", the user must first push the hard key 18c, then select and activate the menu item "destination memory" and finally select and activate the end-menu item "Becker", each by operating the rotary push button switch 16. At least for each selection of an menu item or end-menu item 32,34 the user has to focus his attention to the display 22 of the car multimedia system 10 in the dashboard. Generally, this means that the users view is distracted from the street what is to be avoided.

In order to minimize the time of distraction during selection and activation of an end-menu item, the car multi media system 10 has implemented a function which automatically selects an end-menu item 34 in response to the operation of a hard key 18. Particularly, the system selects an end-menu item on the basis of a predetermined criterion, which is in the present case the frequency of use of the end-menu items belonging to the main menu item.

With respect to Figure 2, this means that upon operation of the hard key 18c end-menu item "Becker" is selected under the assumption that this end-menu item 34 has been used most frequently in the past. Then the user must only activate the selected end-menu item "Becker" by pushing the rotary push button switch 16 as to start the route guidance function.

As a result, the operation is simplified since two handling steps, namely selecting and activating a menu item in the first sub-menu level and selecting an end-menu item in the second sub-menu level, are skipped. The difference between the conventional operation and the operation according to the present invention is indicated by arrows 37 and 38 in Fig. 2.

In a preferred embodiment, the system also automatically activates the selected end-menu item 34. With respect to Figure 2, this means that the end-menu item "Becker" is automatically selected and activated in response to the operation of the hard key 18c. Hence, according to this embodiment, the user may start the route guidance to the address associated with "Becker" just by one switching activity.

It is to be understood that the criterion "frequency of use" is just one, however the preferred, way of selection. A person skilled in the art will recognize that other criteria are also conceivable. The present invention is not limited to the criterion "frequency of use".

It may also be implemented that the criterion is variable depending on the selected root menu item. In other words, the selection of an end-menu item belonging to the root menu item "navigation" is carried out differently to the selection of an end-menu item belonging to for example the root menu item CD or radio.

Of course, the system allows to "overrule" the automatic selection of an end-menu item by operating the respective hard key 18 twice within a short predetermined period. The system recog-

nizes this double operation and displays the menu item 32 of the first sub-menu level in the display 22 in response thereto. The user may then select and activate the desired menu items in the conventional manner.

In Figure 3 the functional structure of the car multimedia system is shown in form of a block diagram. The car multimedia system 10 comprises a main controller 50 which generally comprises at least a microprocessor or a microcontroller. The main controller 50 is mainly responsible for controlling all peripheral units and to perform all operations necessary for providing the functions of the car multimedia system, like radio, CD, navigation, telephone, etc.

It is apparent for the man skilled in the art that the main controller 50 may comprise a couple of different circuits in practise, for example the microprocessor, a graphic driver circuit, a clock generator, etc.

The main controller 50 is coupled with a read only memory circuit 52 which serves to store all program data (firmware). Of course, the read only memory may be provided as an erasable and rewriteable read only memory, like EPROM, EEPROM, etc. Erasable read only memory circuits 52 have the advantage that the firmware for operating the car multimedia system may be updated.

In addition to the read only memory circuit 52 a random access memory circuit 54 (RAM) is also provided and coupled with the main controller 50. The random access memory serves to store temporary data and user specific data, in particular. For example, with respect to Figure 2 the random access memory 54

stores destinations programmed by the user. These stored destination data then form the menu items of the second sub-menu level.

The main controller 50 is electrically coupled with the display 22.

For allowing inputs a selection key unit 56 is provided and electrically coupled with the main controller 50. The selection key unit 56 comprises a couple of different control elements for example hard keys 58, soft keys 60 and rotary push button switches 62. Of course it is to be understood that other control elements may be provided if necessary. For example, a rotary push button switch may be replaced with a two way or four way switch and an additional confirmation switch. The hard keys and soft keys 58, 60 are provided as push button switches. In terms of mechanical structure, however, there is no difference between the hard keys 58 and the soft keys 60.

The main controller 50 is connected with further functional units namely an audio unit 64 comprising a CD device, a radio device (tuner), amplifiers, etc. The CD device is referenced with reference numeral 66 and the radio device is indicated with reference numeral 68. Further functional units are the navigation unit 70 and the telecommunications unit 72. The navigation unit for example comprises a DVD ROM device for receiving navigation data on a DVD ROM, a GPS receiver, a GPS antenna, etc. The telecommunications unit 72 comprises for example a GMS device and a GMS antenna.

Since the structure of these units 66-72 is not part of the present invention it is refrained from describing them in detail. A man skilled in the art knows how to design these units.

As already described before, the present invention provides an improved operation of the car multimedia system, namely by simplifying the selection and activation of an end-menu item.

To implement this improved operation, a discriminating device 80 is provided. The discriminating device 80 is electrically coupled with the main controller 50 and communicates therewith. Further, the discriminating device is coupled with the random access memory circuit 54 as to allow read and write operations of data.

The discriminating device 80 builds up and maintains a data structure and continuously updates the respective data necessary for carrying out the above mentioned automatic selection and activation of an end-menu item. In particular, the discriminating device 80 builds up a data structure as exemplarily shown in Figure 4. However, it is to be noted that this is merely one example of a data structure and other data structures are also conceivable.

The data is preferably structured as data lists 82, each list 82 comprising at least one data packet 84. Each data list 82 is assigned to a main menu item, for example navigation, telecommunications and radio.

With respect to the data list 82 assigned to navigation, two data packets are indicated with the names "Becker" and "WWP-S"

as already used in Figure 2. Each data packet 84 is divided into sub-packets in order to store different values. These values are also shown in Figure 4 which are sub-menu item, number of selections (frequency of use) and last use. The first value "sub-menu item" is preferably a pointer pointing to the respective data stored in the random access memory 54. The second value "number of selections" is a counter and defines the number of former uses of this end-menu item. In other words this value represents the frequency of use of the respective end-menu item. The third value "last use" is the date of the last use of the respective end-menu item.

In the present embodiment the first data packet has the values "Becker", 10 and 29/01/2004; these values indicate that the end-menu item "Becker" has been selected and activated ten times and the last use of this end-menu item was January 29, 2004. The second data packet contains the values "WWP-S", 5 and 13/01/2004.

In the present embodiment, the data packets of the third data list 82 assigned to "navigation" is ordered with respect to the value "number of selections". That is the third data packet "Becker" defines the first element in the data list since the number of selections value is greater than the respective values of the other data packets.

As already mentioned before, the discriminating device 80 serves to maintain the data lists and data packets. Particularly, it updates the number of selections value in response to the selection and activation of the respective end-menu item. It further updates the "last use"-value.

Optionally, the discriminating device 80 is able to delete data packets out of the data lists if data packets have not been used for a predetermined period. Of course, it is also conceivable that the user may delete individual data packets or all data packets in the data lists by operating the selection key unit.

In addition to the build up and maintenance of the data structure, the discriminating device 80 causes the controller 50 to select and activate the end-menu item forming the first data packet in the respective data list 82 in response to the operation of a hard key 18. Upon operation of a hard key, the main controller 50 informs the discriminating device 80 thereof and receives the information from the discriminating device 80 which of the end-menu items is to be selected and optionally activated. The discriminating device 80 in turn gets this information from the data list 82. Simultaneously, the discriminating device 80 updates the respective values of the selected data packet.

As already mentioned before, the user may overrule the discriminating device 80 by double pushing the hard key. In this case the discriminating device 80 does not transmit an information to the main controller 50 about the end-menu item to be selected. Instead, the main controller 50 displays the stored menu items of the next sub-level menu. Nevertheless, the discriminating device updates the respective values of the data packet associated with the end-menu item the user has selected and activated manually.

It is to be understood that the functional structure of the car multimedia system as shown in Figure 3 is just one example and the present invention should not be limited thereto. Particularly, the discriminating device 80 may be also be part of the main controller 50 and may be implemented as hard- and/or software. Further, the car multimedia system 10 may comprise only the navigation unit, the audio unit, the telecommunications unit or each possible combination thereof.

Further, a man skilled in the art knows that other data structures may also be used to implement the present invention.

Those skilled in the art can now appreciate from the forgoing description that the broad teachings of the present invention can be implemented in a variety of forms. Therefore, while this invention has been described in connection with a particular example thereof, the true scope of the invention should not be so limited since other modifications will become apparent to the skilled practitioner upon a study of the drawings, specification and the claims.

CLAIMS

1. Car multimedia system comprising
 - an audio unit,
 - a navigation unit for route guidance,
 - a controller device for controlling said units,
 - a display for displaying selection menus with hierarchically structured menu items and end-menu items, said end-menu items allowing to start a specific function, and a selection key unit comprising at least a push button selection switch, a two way switch for selecting and a push button activation switch for activating the menu items and the end-menu items, characterized by
 - a discriminating device adapted to select one of the end-menu items in response to an actuation of said push button selection switch, by skipping sub-levels and the menu items between a root menu item and said end-menu item, said end-menu item being selected by said discriminating device on the basis of a predetermined criterion.
2. The car multimedia system of claim 1, characterized in that said discriminating device is adapted both to select and activate said end-menu item.
3. The car multimedia system of claim 1 or 2, characterized in that said criterion is the number of former selections of the end-menu items assigned to said push button selection switch.
4. The car multimedia system of claim 3, characterized in that said discriminating device is adapted to select the end-menu item with the largest number of former selections.
5. The car multimedia system of any one of claims 3 to 4, characterized by a data memory for storing data packets

each being assigned to an end-menu item, wherein each data packet carries the number of selections of the assigned end-menu item.

6. The car multimedia system of claim 5, characterized in that each data packet further carries the date of last use of the assigned end-menu item.
7. The car multimedia system of claim 5 or 6, characterized in that said data memory stores at least two data packets for each assigned end-menu item.
8. The car multimedia system of any one of claims 1 to 7, characterized in that said discriminating device is adapted to allow the selection of menu items according to their hierarchical structure by using the two way switch and the push button activation switch, wherein this mode of selection is termed overrule mode.
9. The car multimedia system of claim 8, characterized in that said overrule mode is activated by a double activation of said push button selection switch.
10. The car multimedia system of claim 5, characterized in that said controller device is adapted to delete said data packets assigned to at least one of said end-menu items in response to a predetermined input via said selection key unit.
11. The car multimedia system of claim 1 or 2, characterized in that said control device is adapted to allow the selection of a criterion out of a predetermined list of criteria via said selection key unit.
12. The car multimedia system of any one of claims 1 to 11, characterized by a telecommunications unit comprising a telephone module and an internet module allowing e-mail

and SMS transmission, WAP, and other telecommunication services.

13. The car multimedia system of any one of claims 1 to 12, characterized in that said audio unit comprises a radio module and a CD module.
14. The car multimedia system of any one of claims 1 to 13, characterized in that said two way switch and said push button activation switch are provided as a rotary push button switch.
15. The car multimedia system of any one of claims 1 to 14, characterized in that said push button selection switch is provided for activating the navigation unit.
16. The car multimedia system of claim 15, characterized in that a further push button selection switch is provided for activating the audio unit.
17. A method for activating a function of a car multimedia system, the system comprising an audio unit, a navigation unit for route guidance, a controller device for controlling said units, a display for displaying selection menus with hierarchically structured menu items and end-menu items, said end-menu items allowing to start a specific function, and a selection key unit comprising at least a hard key, a rotary knob for selecting and a push button switch for activating the menu items, characterized by the step of selecting the end-menu item in response to an actuation of said hard key by skipping sub-levels and the menu items between a root menu item and said end-menu item, wherein said end-menu item is selected on the basis of a predetermined criterion.

18. The method of claim 17, characterized in that said end-menu item is both selected and activated in response to said actuation of said hard key.
19. The method of claim 17 or 18, characterized in that said criterion is the number of former selections of said end-menu items assigned to said hard key.
20. The method of claim 19, characterized in that the end-menu item with the greatest number of selections is selected.
21. The method of claim 19 or 20, characterized in that with each selection of an end-menu item a counter value assigned to said end-menu item is increased by one.
22. The method of claim 21, characterized in that an actual date of use is stored for an end-menu item with each selection of said end-menu item.
23. The method of any one of claims 17 to 22, characterized in that the selection and activation of menu items according to their hierarchical structure is allowed in response to a predetermined operation of said selection key unit.
24. The method of claim 21, characterized in that said counter values may be deleted either separately or in common via said selection key unit.

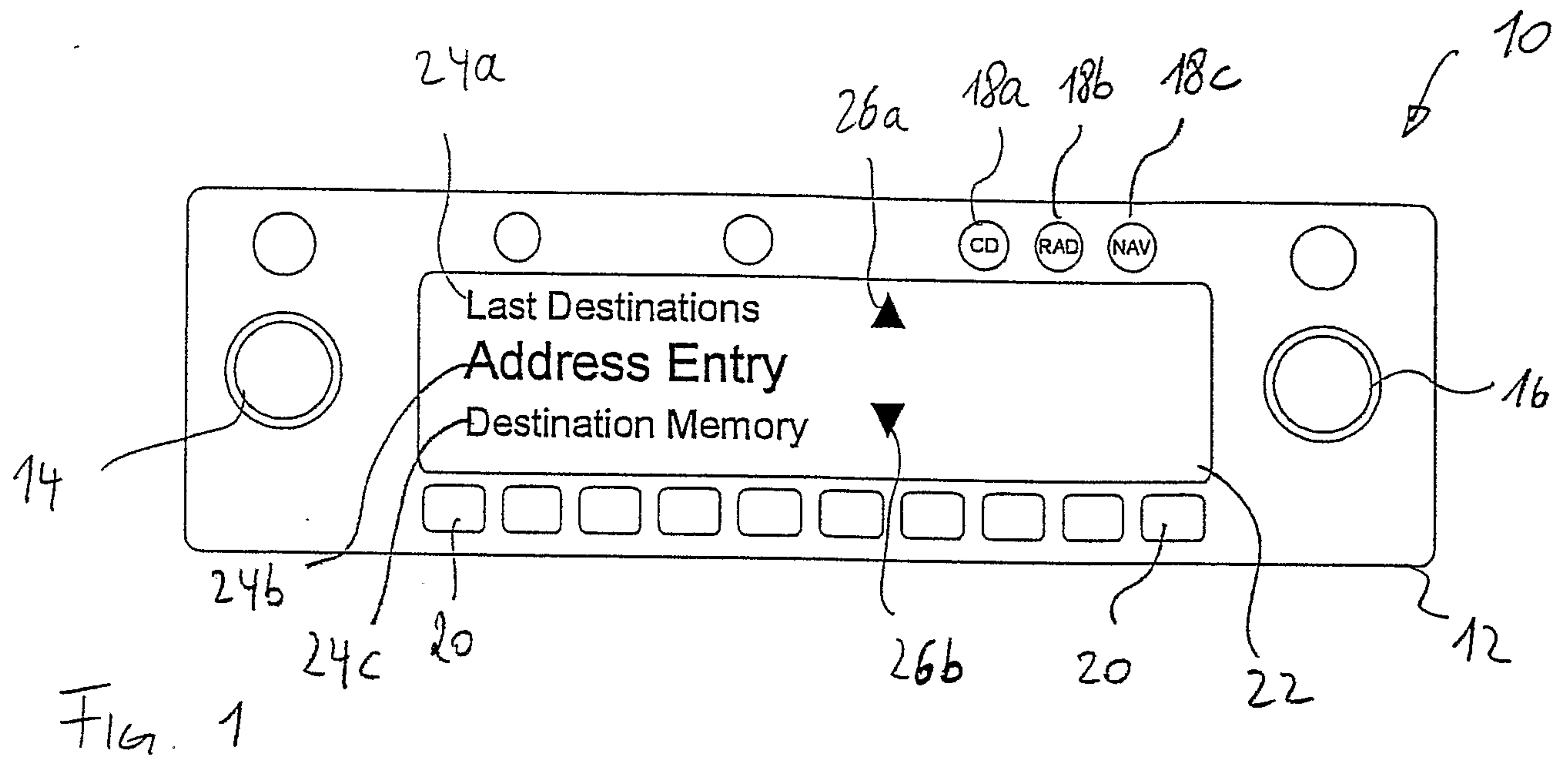


Fig. 1

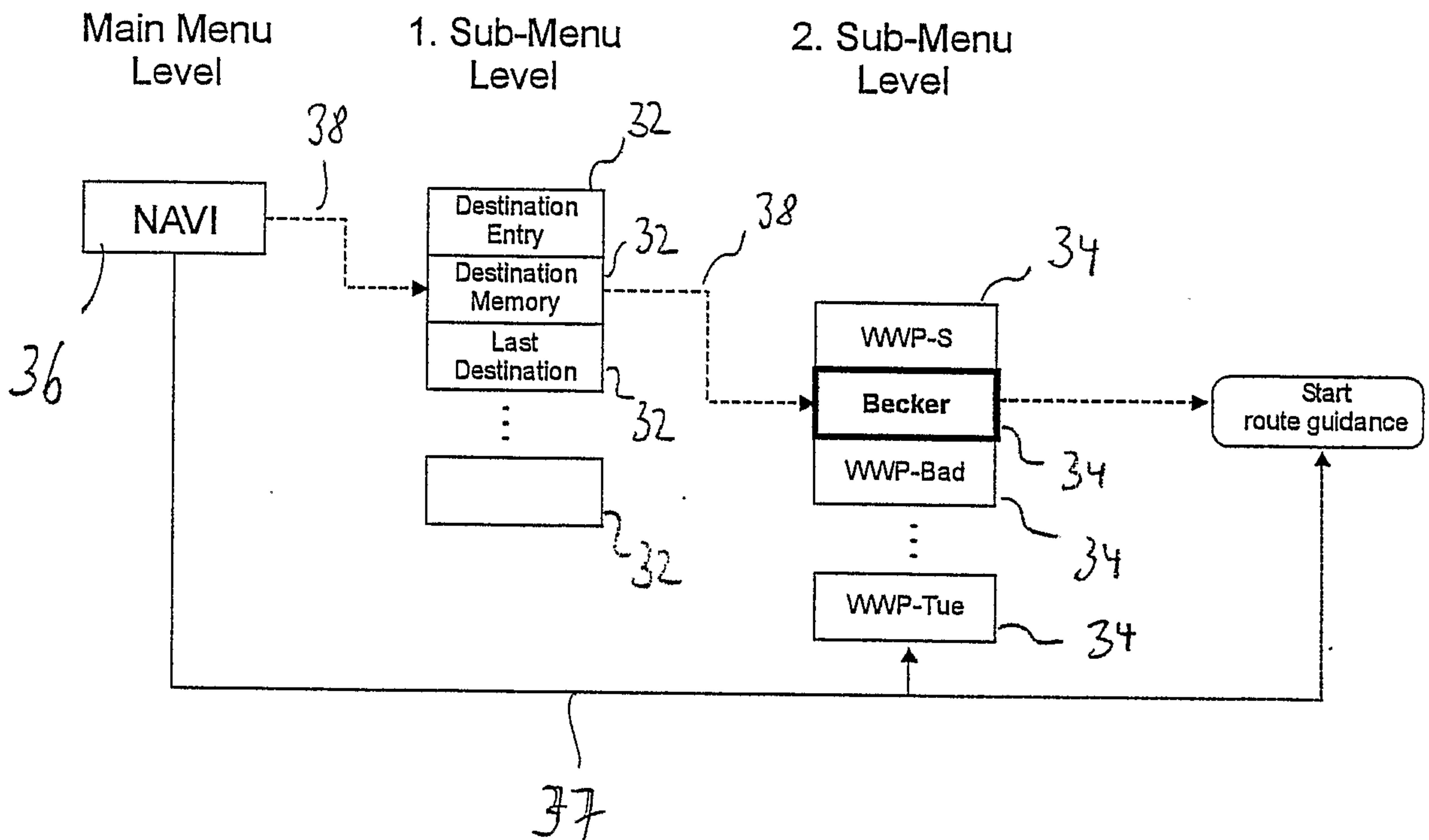


Fig. 2

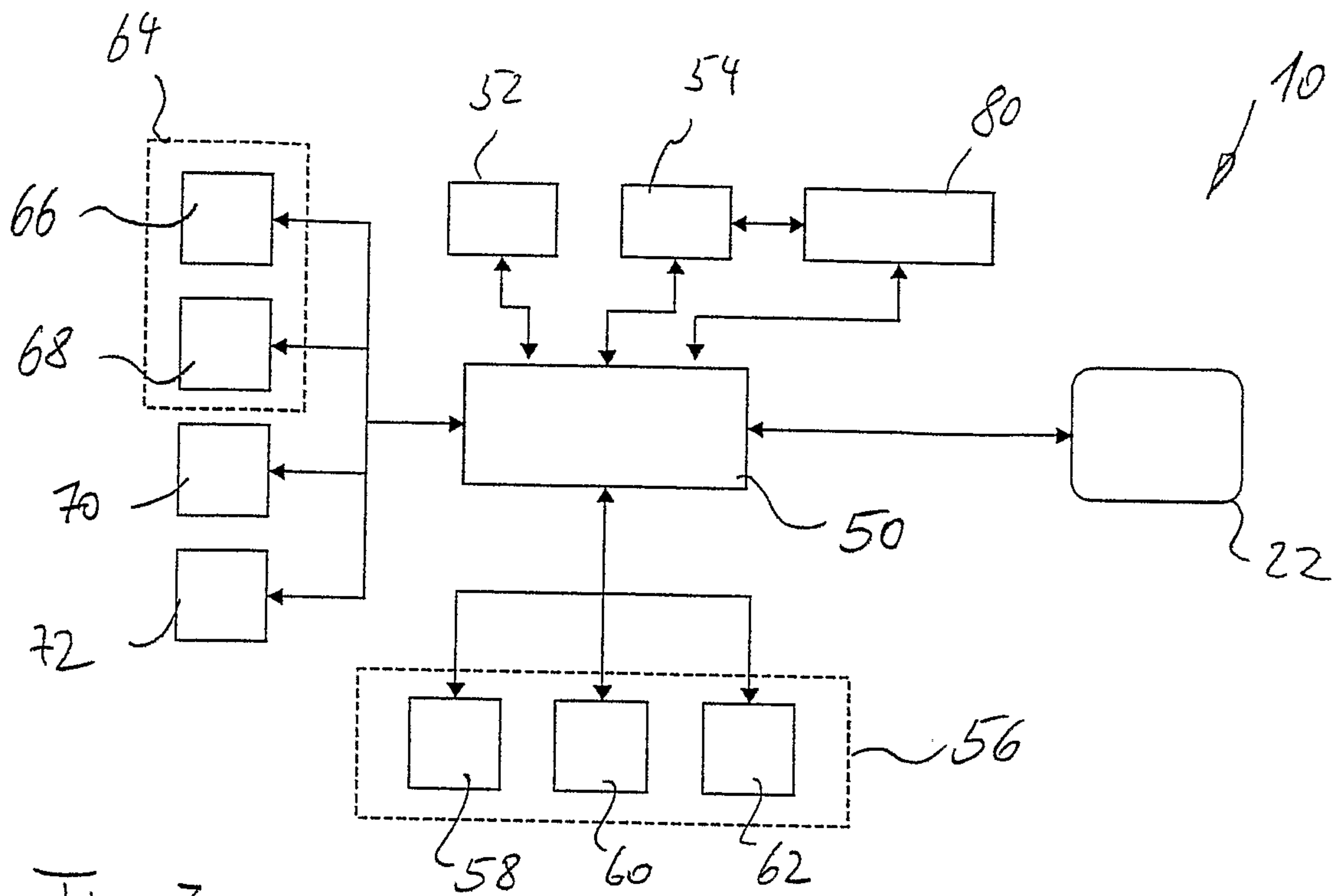


FIG. 3

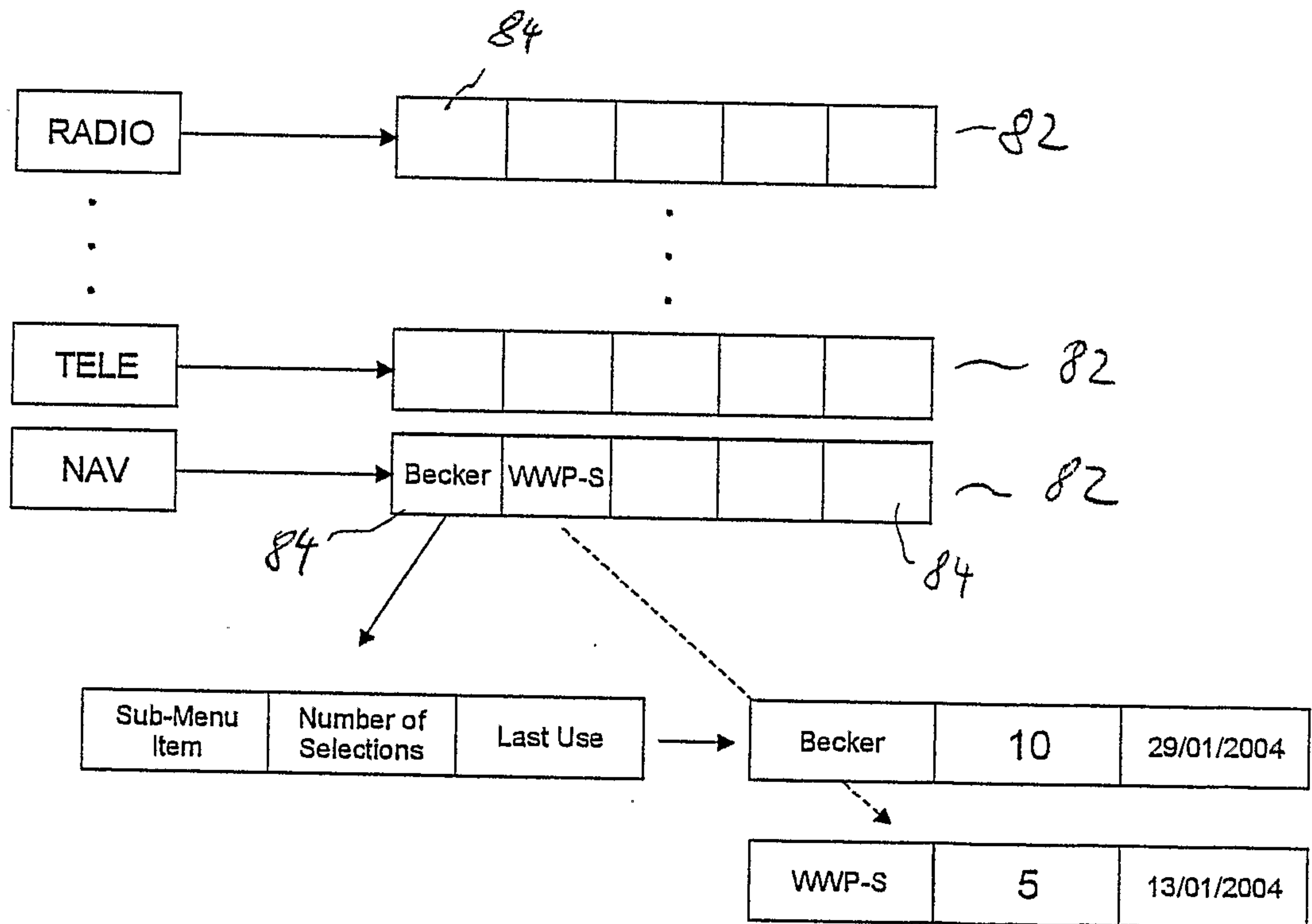


FIG. 4

Main Menu
Level

1. Sub-Menu
Level

2. Sub-Menu
Level

