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Europäische Patentanmeldung EP 1 302 751 A2 [European Patent Application EP 1 302 751 A2]
filed on 09/10/2002 and published on 04/16/2003 at the European Patent Office Patent,

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I certify under penalty of perjury that the foregoing is true and correct.

Date: October 21, 2014

Signature Judith E. Taddeo



(12) **EUROPEAN PATENT APPLICATION**

(43) Publication date:
 16.04.2003 Patentblatt 2003/16

(51) Int Cl.7: **G01C 21/36**

(21) File number: 02020198.4

(22) Filing date: 10.09.2002

(84) Designated contracting states:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
IE IT LI LU MC NL PT SE SK TR
 Designated extension states:
AL LT LV MK RO SI

(72) Inventor:
 • Demir, Cesim, Dr.
 71134 Aidlingen (DE)
 • Melheritz, Markus, Dr.
 71254 Ditzingen (DE)
 • Windhab, Marcus
 73776 Altbach (DE)

(30) Priority: 10.10.2001 DE 10149862

(71) Applicant: **DaimlerChrysler AG**
 70567 Stuttgart (DE)

(54) **Method and device for destination selection in a navigation system in a motor vehicle while using a service control point**

(57) The invention relates to a method and a device for destination selection of a navigation system in a motor vehicle while using a service control point. To select a destination, the service control point supplies the motor vehicle with destination information data, set up according to user specifications, in a wireless manner.

According to the invention, an operating unit is provided in the motor vehicle, and

- at least one alphanumeric address specified by the user while using the operating unit and/or a voice communication means is transmitted to the service control point as a data message or a voice message in a wireless manner,
- the service control point generates suitable destination information data for the destination selection of the navigation system in connection with this address,
- the service control point supplies the destination information data generated in a wireless manner to the operating unit, and
- the operating unit actuates the navigation system using the destination information data.

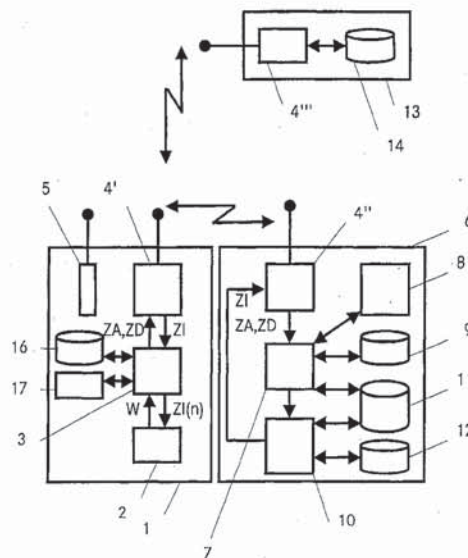


Fig. 1

Description

[0001] The present invention relates to a method for destination selection of a navigation system in a motor vehicle, while using a service control point according to the definition of the species in Claim 1, as well as to a device for carrying out the method according to the definition of the species in Claim 15. The service control point, in this context, is a central processing unit having a database that can be used in a wireless manner by subscribers to a corresponding service.

[0002] For carrying out a navigation, that is, the calculation and display of a suitable driving route to a travel destination, a destination must first be selected in the navigation system. To select a destination, a user-selected travel destination is provided to the navigation system, the automated processing of the travel destination in the navigation system taking place in geographical coordinates.

[0003] German document DE 37 44 532 A1 describes a method for destination selection of a navigation system in a motor vehicle; to select a destination, a user inputs data in the form of street names and house numbers. Interpolation point data stored in a data memory are checked for agreement with the input data. If agreement is established, the data required for the navigation are taken over from the data memory. Consequently, the geographical coordinates of all possible streets and house numbers must be stored ahead of time in the data memory.

[0004] European document EP 0 933 744 A2 describes a method for searching for a destination address, the destination address being used for the destination selection by a navigation system. Data input by a user are completed to form the destination address, in that missing data are ascertained in conjunction with an address-related information system in the form of a dialog with the user.

[0005] In generic document DE 298 12 320 U1, a device for destination selection of a navigation system in a motor vehicle is described, in which a user undertakes the input of data for the destination selection outside of the motor vehicle, on a computer system having the usual input means. The input data are temporarily stored in a service control point that is separate from the computer system, and, upon request, are supplied to the navigation system in a wireless manner. The user is also able to select one of several destinations input previously, by requesting the corresponding data. A free selection of the travel destination by the user in the motor vehicle is not provided.

[0006] It is the object of the present invention to improve the generic method in such a way that the operating convenience is increased and the usefulness is improved.

[0007] For the method, this objective according to the

present invention is attained by the features of Claim 1 and for the device, by the features of Claim 15. The dependent claims relate to advantageous embodiments and refinements of the present invention.

[0008] The main idea of the invention is that, in a motor vehicle having a navigation system, an operating unit is additionally provided, and for the destination selection of the navigation system, at least one user-defined destination address is wirelessly sent to a service control point, where suitable destination information data for this address is generated; the destination information data generated are wirelessly supplied to the operating unit, and the operating unit actuates the navigation system using the destination information data. In other words, the service control point is used to process one or more travel destination(s) selected by the user in such a way that these travel destinations are able to be used for destination selection in the navigation system of the motor vehicle. The user unambiguously specifies the travel destination for selection.

[0009] In one advantageous specific embodiment, the destination address is specified by the user as the complete, conventional address, for instance, in the format: first name, last name, street name, house number, place of residence". A selected travel destination is thereby unequivocally named as destination address by the user in a particularly simple manner.

[0010] The method according to the present invention advantageously allows a convenient and accurately addressed destination selection of the navigation system at all times. Instead of carrying out a cumbersome and time-consuming operating process, the user merely specifies his selected travel destination as the destination address, for instance, in the form of a conventional address. This simplification of the destination selection increases the readiness for using the navigation system, and thus enables a convenient, reliable and stress-free trip to the travel destination. In addition, because of the resulting greater acceptance by the user, the demand for navigation systems becomes greater and thereby ensures the business success of manufacturers of navigation systems. The restriction of the data to be transmitted in a wireless manner between the motor vehicle and the service control point to one or more destination addresses, or destination information data, minimizes the communication costs as well.

[0011] Because of the use of the service control point in the destination selection of the navigation system, it is possible to access a particularly voluminous and current data base. This database is used to generate suitable destination information data. This being the case, no memory is required in the motor vehicle for the complete storage of all destination addresses of the navigation system. Furthermore, no updating of the destination addresses stored in the motor vehicle is necessary. In the present invention, the service control point is used "as late as possible", which ensures the most current state possible of the database. The generation of the destination

information data at the service control point, in this context, is provided in automated form, by operating personnel, or as an optional combination of these two forms.

[0012] In one advantageous specific embodiment of the present invention, at least one of the destination addresses is specified by the user while using the operating unit. For this purpose, the operating unit in the motor vehicle is suitably developed, for instance as a function of preferences and financial means of the user. For instance, the operating unit includes a microphone for recording a destination address specified acoustically by the user. In addition, the operating unit may include voice recognition, which processes the destination address specified acoustically by the user into a corresponding data message. One skilled in the art knows other implementation possibilities, and these may be provided individually or also in various combinations.

[0013] One particularly advantageous specific embodiment sends at least one of the destination addresses as a voice message to the service control point. For this, a mobile phone is preferably used, such as is already routinely taken along on trips by the majority of users. This being the case, the user is not expected to use an unfamiliar device for the destination selection, but instead uses the mobile phone to which he is accustomed, for example. In addition, the technology expenditure in terms of devices for destination selection of the navigation system is reduced, in that devices already owned by the user and/or available in the motor vehicle are used for the destination selection.

[0014] One further advantageous specific embodiment sends at least one of the destination addresses as a data message to the service control point. As shown above, for example, a suitable data message is generated by voice recognition from a destination address specified acoustically by the user. A further example is the creation of a data message by one of the portable devices carried by the user (PDA, "personal digital assistant") by retrieving stored addresses. A suitable transmission means is provided, for example, in the motor vehicle and/or in the portable unit carried by the user.

[0015] Standardized addresses, such as in the form of "Microsoft VCard - Standard" are especially suitable for specifying destination addresses by the user. By specifying a certain form and a certain scope when identifying the destination address, such a standard increases the recognition reliability of the destination selection. Furthermore, the use of standardized addresses allows a particularly simple utilization of address databases already in existence.

[0016] The destination selection according to the present invention of the navigation system, while using the service control point, allows the user to make a particularly convenient and rapid destination selection. Consequently, the user will frequently include intermediate travel destinations in his destination selection (such as places of interest or restaurants close to the travel route). The inclusion of

an individual and flexible trip.

[0017] In one advantageous embodiment, at least one of the specified destination addresses is able to be identified in addition. In particular if more than one destination address is indicated (i.e., when intermediate travel destinations are included), this enables a special identification of a mentioned destination address, e.g., as "intermediate destination" or as "final destination".

[0018] Using the destination information data generated by the service control point and supplied to the operating unit, the operating unit actuates the navigation system. If at least one intermediate destination is included in the destination information data, the actuation may be carried out in two different ways. For one, the operating unit may use the destination information data to actuate the navigation system individually for each intermediate destination. This type of actuation allows the use of navigation systems that offer no option for navigation using intermediate destinations. For another, the operating unit may use the destination information data to actuate the navigation system in collective manner. This allows the operating unit to have a simpler design and especially flexible navigation.

[0019] In one advantageous embodiment, identifying information of the navigation system is transmitted to the service control point. This identifying information is used to describe the navigation system more precisely and, for example, and is made up of the model type of the navigation system. The service control point uses the identifying information to generate destination information data that is especially suitable for the destination selection of this particular navigation system.

[0020] In one advantageous embodiment, information for identifying the user selecting the destination is transmitted to the service control point. This further increases the recognition reliability of the destination selection in that, for example, information about destination addresses that had previously been selected by this user is stored in the service control point. Moreover, the convenience is enhanced, for instance by using a "personalized destination database" of the user.

[0021] It is especially advantageous if the use of the service control point takes place via a mobile telephone network in the present invention. The mobile telephone network allows a wireless link to be established between service control point and motor vehicle, with virtually blanket coverage while utilizing the existing infrastructure. Mobile telephone networks in various developments are usable, e.g., on the basis of satellites, GSM, UMTS ("Universal Mobile Telephone System"), or WLAN ("Wireless Local Area Network"), either individually or in any combination.

[0022] A device for destination selection of a navigation system in a motor vehicle utilizing

a service control point, in which, for the destination selection, destination information data generated based on user input is wirelessly supplied from the service point center to the motor vehicle, is characterized in that an operating unit is provided in the motor vehicle and the motor vehicle is equipped with communication means and/or a voice-controlled communication means. At least one destination address, identified by the user while using the operating unit, is transmitted in a wireless manner by the communication means in the vehicle as data and or voice message to the communication means in the service point center, and/or at least one destination address acoustically specified by the user is wirelessly transmitted by the voice communication means to the communication means in the service control point. In the service control point, a destination recognition means, in cooperation with a means for generating destination information data, generates suitable destination information data for destination selection of the navigation system in the motor vehicle to this particular destination address, utilizing at least one address database and a digital road map. The generated destination information data are wirelessly transmitted from the communication means in the service control point to the communication means in the motor vehicle, and then supplied to the operating unit. The operating unit uses the destination information data to actuate the navigation system.

[0023] One advantageous embodiment of the present invention is described in greater detail with the aid of the drawing.

[0024] The single Figure 1 shows a schematic representation of a block diagram of a method and a device for destination selection of a navigation system in a motor vehicle utilizing a service control point.

[0025] Figure 1 shows a device for destination selection of a navigation system in a motor vehicle while utilizing a service control point, together with its components that are of interest here, in their functional interactions, in the form of a block diagram. At the same time, Figure 1 represents a flow chart of the sequence of the destination selection method executed by this device, if, for this purpose, the individual blocks of the block diagram are viewed as method steps and not as system components, which steps are carried out by the individual system components. In the following text, the description of the individual system components and the functions they execute therefore takes place in parallel.

[0026] Figure 1 shows a motor vehicle 1, which includes a navigation system 2 having a conventional design, an operating unit 3, storage means 16 having dynamic local addresses (hereinafter abbreviated to local memory 16), a means for driver identification 17 (hereinafter abbreviated to identmeans 17), and a communication means 4'. In addition, motor vehicle 1 has a voice communication means 5, such as a mobile phone. Communication means 4' at least intermittently establishes a wireless, bidirectional

communication link to a communication means 4'' in a service control point 6. Voice communication means 5 at least intermittently establishes a wireless, unidirectional communication link to communication means 4'' in a service control point 6. In addition, service control point 6 includes a destination recognition means 7, operator access 8, an address database 9, a means for generating destination information data 10, a digital road map 11, and a personalized destination database 12. In this embodiment, a data center 13 including a communication means 4''' and a storage means 14 is provided in addition.

[0027] Operating unit 3, for example, is embodied as control device or as conventional processing system, such as "car PC", and transmits and receives signals to/from communication means 4', local memory 16, identmeans 17, and navigation system 2. Navigation system 2, operating unit 3, local memory 16, identmeans 17, and communication means 4' are electrically interconnected for the transmission and reception of signals, e.g., via a network provided in the vehicle such as a "CAN bus". Communication means 4', 4'', 4''', as well as voice communication means 5, individually or in any combination, utilize for the wireless communication a mobile telephone network based, for example, on satellites, GSM, UMTS ("Universal Mobile Telephone System"), and/or WLAN ("Wireless Local Area Network"). Both the use of voice messages, e.g., in the form of a telephone call, and data messages such as text messages (SMS "Short Message Service") or a radio data transmission (WAP "Wireless Application Protocol" or "Mobile Internet") are provided in communication means 4', 4'', 4'''.

[0028] In a first processing step, the user specifies at least one user-selected destination as destination address. One option for making this identification is the use of operating unit 3. For this purpose, operating device 3 includes, for example, a microphone for an audio recording of one or all destination address(es) acoustically named by the user. The audio recording of the acoustically identified destination addresses is transmitted as voice message ZA to communication means 4'. As an alternative, the audio recording is forwarded to a voice recognition module included in operating unit 3, automatically processed, and transmitted as corresponding data message ZD to communication means 4'. It may in this context also be provided to transmit a destination address that is not to be processed automatically by the voice recognition module as voice message ZA to communication means 4' instead.

[0029] In addition or as an alternative, operating unit 3 accesses a local memory 16. For example, addresses that are wirelessly transmitted from a portable device carried by the user

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