

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
23 April 2009 (23.04.2009)

PCT

(10) International Publication Number
WO 2009/051484 A2

(51) International Patent Classification:
G01C 21/36 (2006.01)

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(21) International Application Number:
PCT/NL2008/050656

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

(22) International Filing Date: 17 October 2008 (17.10.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
1034554 19 October 2007 (19.10.2007) NL
1034551 19 October 2007 (19.10.2007) NL
1034553 19 October 2007 (19.10.2007) NL
1034552 19 October 2007 (19.10.2007) NL
1034555 19 October 2007 (19.10.2007) NL

(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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL,
NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG,
CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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Published:

— without international search report and to be republished
upon receipt of that report



WO 2009/051484 A2

(54) Title: METHOD OF NAVIGATION, DATABASE AND COMPUTER PROGRAM PRODUCT THEREFOR

(57) Abstract: Current invention relates to a method of navigation, using a navigation device, wherein preferences of a user are entered into the navigation device, wherein at least a destination is entered into the navigation system, whereafter a number of POI's is presented by the navigation device, whereby the POI's are at least partially selected based on proximity to the navigation device and at least one quality parameter entered previously into a database connected to or integrated in the navigation device.

P82889PC00

Title: Method of navigation, database and computer program product
therefor

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The invention relates to a method of navigation, like for example personal or car-installed navigation.

Navigation devices for a method of navigation currently are able to guide a user to a specified destination by giving vocal and/or visual
10 instructions on the track to follow. Most applied navigation systems are car based systems and personal navigation devices (PND's). These devices are generally equipped with a screen or display device whereupon a map of the surroundings can be projected, with an overlay of the real time location of the user and a possible track to follow to reach a predetermined destination. In
15 these devices certain points of interest (POI's) can be requested to be displayed. The device can upon request present a list of the required POI and put an additional overlay on the displayed map showing the respective POI's.

A drawback of the systems known in the art is that generally in currently available PND's, POI's are displayed based on brand and/or type of
20 the POI concerned and on its position relative to the real time location of the user involved (proximity).

The information given is thus restricted to the actual location, based on the address and place of the POI and its type. Furthermore the POI information in currently available Geographic Information Systems (GIS) is
25 static, meaning that the POI databases suffer the once filled never corrected syndrome.

It is an object of the current invention to overcome at least one of the above listed drawbacks and/or to solve other problems. It is a further object to provide a functionally advanced navigation system.

30 A first aspect of the invention is a navigation device, having a GPS receiver, a display device and at least one data storage device containing GIS

and POI information, wherein the GPS receiver, the display device and the data storage device are electronically and operable connected to a computer and/or processing unit wherein a POI data record is provided containing at least one data field for data chosen from the group containing geographic data, POI type data, POI name data and other POI data, wherein the POI data record further contains at least one data field with at least one quality parameter wherein selected data of the POI records is retrievable by the processing unit and depictable on the display device and displayed at least on the basis of the at least one quality parameter.

10 In this navigation device the quality parameter of a POI can contain an indicator concerning a membership, a dynamic quality parameter and/or additional information on the POI selected from the group containing among others: quality of the service level, additional pictures, historic information, additional services offered, moving 3d views, promotion films of the POI
15 virtual guided tours and/or other promotional material.

The depicted POI's can e.g. be activated by clicking thereon. The data storage device in the navigation device can be selected from a group containing among others random access memory, read only memory, DVD, CD, CD-rom disks, hard disks, flash memory or other storage mediums.

20 In a further aspect of the invention, the selected data of a POI can further comprise data based on proximity of the POI to the device. The distance between the POI and the position of the navigation device can be for instance calculable by the processor and can be combinable with a weight factor multiplied with the at least one quality parameter. Alternatively, the
25 digital dynamic quality parameter can be based upon a user evaluation of the users of the POI. This set of digital dynamic quality parameters can be stored in a set of data fields in a POI data record.

Yet a further aspect of the invention concerns a database, comprising GIS data and POI data records, wherein the POI data records
30 comprise way point data of the POI and wherein in at least a number of the

POI data records at least one quality parameter of the POI is provided. This database can allow ranking of the POI's of which data records are comprised in the database, based on at least one of said at least one quality parameter.

The invention further relates to a method of navigation, using a navigation device, wherein preferences of a user are entered into the navigation device, wherein at least a destination is entered into the navigation system, whereafter a number of POI's is presented by the navigation device, whereby the POI's are at least partially selected based on proximity to the navigation device and at least one quality parameter entered previously into a database connected to or integrated in the navigation device.

In another aspect of the invention, a method of finding points of interest (POI's) is provided comprising the following steps: providing a navigation means having storage means for storing a geographical information system, positioning means for deriving the exact location of the navigation device and display means for displaying the location of the device, providing a graphical information system within the navigation means containing data of an electronic road map, providing data concerning the location and type of points of interest, providing at least one quality parameter for each of the points of interest, depicting on the displaying device a location specific map, based on the geographical information system and depicting a predetermined number of POI's, based on a high score of a ranking based on the at least one quality parameter of the POI's.

In this method, the quality parameter can be based upon a membership and the predetermined number of POI's can be depicted in an overlay on the depicted location specific map. The ranking can for instance be based upon a combination of the proximity and the quality parameter.

The quality parameter can further comprise information on the POI selected from the group containing among others: information on the membership of the program, quality of the service level, additional pictures, historic information, additional services offered, moving 3d views, promotion

films of the POI virtual guided tours and/or other promotional material. The depicted POI's can be activatable by for example clicking thereon.

In a further elaboration of the invention, the device for the above described method is a navigation device.

5 Another aspect of the invention relates to a computer program product whereby the program is stored on a data storage device and retrievable in the working memory of a central processing device, the computer program, when running on the processing device being able to retrieve GIS from a data storage device, receive a position of the device from a GPS
10 receiver, project upon a display device a map based on the GIS, retrieve POI's data records from the data storage device, and generate an overlay with POI's on the map on the display device.

In this computer program product, the POI data record can contain a data field containing a quality parameter. This quality parameter can for
15 instance be based on a membership and can comprise information on the POI selected from the group containing among others: information on the membership of the program, quality of the service level, additional pictures, historic information, additional services offered, moving 3d views, promotion films of the POI virtual guided tours and/or other promotional material.

20 In This computer program product, the depicted POI's can be activatable by clicking thereon.

A further aspect of the invention concerns a database, suitable for providing POI information on an map wherein the database comprises a GIS and data records of POI's wherein the data record of the POI's comprise at
25 least a data field comprising a quality parameter. In this database, the POI data record can further comprise data fields comprising a waypoint and/or a POI type indication. In this database, the quality parameter can comprise information on the POI selected from the group containing among others: information on the membership of the program, quality of the service level,
30 additional pictures, historic information, additional services offered, moving 3d

views, promotion films of the POI virtual guided tours and/or other promotional material. In this database, the depicted POI's can be activatable by clicking thereon.

In an alternative aspect, the inventions relates to a navigation
5 device having a screen and/or projecting device whereon a location based map can be displayed on which an overlay of POI's can be positioned wherein the POI's are selected, highlighted and/or ranked based on a quality parameter, wherein the quality parameter comprises an indication of a membership.

The quality parameter can further comprise additional information
10 on the POI selected from the group containing among others: quality of the service level, additional pictures, historic information, additional services offered, moving 3d views, promotion films of the POI virtual guided tours and/or other promotional material. The depicted POI's can be activatable by clicking thereon.

A user-member can for instance provide at least one quality
15 parameter based upon an evaluation of the POI. A processor can further be provided suitable for depicting POI's selected upon a combination of proximity and the at least one quality parameter. This processor can also be provided for selecting POI's to be depicted based at least partially upon weight factors set
20 by a user. These weight factors can be linearly proportional, differentially proportional or integrally proportional to the distance between the user and the POI.

Alternatively or additionally, a skip distance can be set by the user concerning a maximum distance of the POI's depicted. Further thereto, the
25 POI's can be depicted upon a maximum set travel time.

The navigation device can additionally or alternatively be provided with a GPS receiver, a display device, at least one data storage device containing GIS and POI information, wherein the GPS receiver, the display device and the data storage device are electronically and operable connected to
30 a computer and/or processing unit, the digitally available POI information

being stored in data records in a database on the at least one data storage device within the personal navigation device, the POI record containing at least data fields for at least one of geographic data, for indicating the type of POI, for the name of the POI and/or other data fields.

5 In yet another aspect of the invention, a method for projecting an electronically retrievable map on a display device is provisioned, comprising the steps of: providing a display device, providing a GIS, providing a POI, a database, selecting on the basis of the location of the display device a part of the GIS proximate to the display device, displaying the map based on the
10 proximate GIS part on the display device and overlaying additional information from the POI database, wherein the POI's are selected, highlighted and/or ranked based on a quality parameter.

A further elaboration of the invention can be seen in a method of ranking points of interest based on at least one quality parameter, wherein the
15 point of interest can be displayed on a navigation device, depending on and/or ranked according to the at least one quality parameter, which can for instance be based upon a membership.

In this method, the points of interests can provide geographically based services and whereby members of a membership program can enter
20 their specific rating of a point of interest, wherein this ranking is sent to a server, this server deducing from the ratings given a dynamic gross rating on the point of interest concerned. In addition thereto, the members can select a group of other members with a similar attitude and/or interests and to base the gross rating only on those specific members.

25 The quality parameter can e.g. comprise information on the POI selected from the group containing among others: information on the membership of the program, quality of the service level, additional pictures, historic information, additional services offered, moving 3d views, promotion films of the POI virtual guided tours and/or other promotional material. Yet
30 again the depicted POI's can be activatable by clicking thereon.

A further aspect of the invention can be a computer program product suitable for ranking POI's on the basis of at least one quality parameter, the program when loaded on a processor of a navigation device being able to select from a data base comprising data records with POI's stored on a data storage
5 device, POI's based on a quality parameter and/or a proximity to the navigation device.

The quality parameter used herein can comprises information on the POI selected from the group containing among others: information on the membership of the program, quality of the service level, additional pictures,
10 historic information, additional services offered, moving 3d views, promotion films of the POI virtual guided tours and/or other promotional material. Yet again, the depicted POI's used herein are activatable by clicking thereon.

The invention also concerns a membership program for providers and/or operators of POI's wherein providers and/or operators are provider-
15 member wherein the provider-members can be specially highlighted or otherwise recognisable in a navigation device.

In this membership program at least a number of users of the POI's can be user-members. The users that become user-member can have reductions to those POI's that are provider-members. They can become
20 member upon buying a navigation device and/or upon buying an update of a GIS installed thereon and/or stored therein. The users can for instance earn discounts or loyalty points upon evaluating certain POI's that the user concerned has visited and/or used.

In this membership program, a quality parameter can be provided
25 for each POI that comprises information on the POI selected from the group containing among others: information on the membership of the program, quality of the service level, additional pictures, historic information, additional services offered, moving 3d views, promotion films of the POI virtual guided tours and/or other promotional material.

Again, in this membership program, the depicted POI's can be activatable by clicking thereon. Further thereto a POI database with the information concerning the POI can for instance be stored on a webserver or other storage device operable by the provider of the membership program.

5 For a better understanding, examples of an interface device will now be further elucidated by the following Figures, wherein:

Fig. 1 is diagram of the functional elements of a navigation device known in the art.

10 Fig. 2 is a schematic view of a navigation device according to a first embodiment.

In this description the same or corresponding parts will have identical or similar reference signs. The embodiments shown should not be understood as limiting the invention in any way or form.

15 Navigation is to be understood but is not limited to a system and/or device guiding a user to follow a way, road or specific route (generally called a track) in order to arrive at a certain predetermined destination using indications given by the system and/or device. Modern navigation devices can perform these indications very accurately. In order to do so several functional elements can be provided.

20 A geographical information system (GIS) is to be understood but not limited to a set of retrievable data on roads, ways, crossings and other map relevant information. The geographic data is generally located by a set of coordinates, also known as waypoints. These waypoints are typically defined by longitude and latitude or by UTM (Universe Transverse Mercator)
25 coordinates. A waypoint can be a destination, a road crossing, a point of a road turn, a bifurcation of a road and/or other map specific essential point. The information from the GIS can be retrieved to be depicted as a map on a display device.

30 A Point of Interest is to be understood but not limited to a specific geographical location where a specific service can be provided, where a specific

event and/or where a specific sensory stimulation can be enjoyed such as for example a scenic viewing point, a medieval church and/or any kind of (tourist) attraction. A POI can be located by waypoints as well.

Location based services (LBS) is to be understood but not limited to
5 a certain service that is presented at a specific location. Examples of these services can be providing a place to eat, to sleep, to swim, to get petrol or other services or combinations of services.

Proximity is to be understood but not limited to the distance
between the navigation device and/or its user and a certain waypoint or POI.

10 In Figure 1 a schematic functional diagram of a known navigation device 1 is depicted. The navigation device 1 can have a number of functional elements. These functional elements can include a positioning element 2, an input element 3 for entering destination and/or requested POI information, a data storage element 4 containing geographical information, a display device 5
15 for displaying the geographical information or part thereof, a system 6 for giving the guiding directions to a user a central processing unit 7 for, among other tasks, integrating and communicating with the different elements and for calculating the tracks to follow. A GPS receiver or other location device can be used.

20 Generally in order to perform navigation, a determination of the position of the device is needed, secondly a direction of motion of the device will be assessed and a set of information about the existing infrastructure at the starting location, the destination and the (possible) track in between shall be used.

25 Navigation systems have developed to navigation devices that can receive signals from satellite beacons. A globe spanning web of these satellite beacons is generally known as the GPS (Global Positioning System). From signals of these beacons a receiver can calculate the distance relative to one or more beacons. Since the motion of each of the satellite beacons is well defined,
30 the position on earth of the device can be deduced with an acceptable degree of

accuracy. The positioning can be achieved if the relative distance is known between the receiver and preferably at least three satellite beacons. The paths of the satellite beacons are continuously monitored and possibly controlled in relation to fixed earth based antennas, so as to accurately know the orbits of
5 these beacons.

In order to calculate the exact position, the positioning element 2 can comprise an antenna 8, a receiver-amplifier 9, a signal processor 10 and a clock 11. In figure 2 these elements are schematically depicted. In order to be able to derive the unique location of the GPS receiver, it can calculate the
10 distance relative to a number and preferably at least three satellite beacons. Therefore the receiver must have an adequate number of frequency channels for these separate beacons. A higher number of channels for different beacons will increase the accuracy.

The navigation device of figure 2 comprises central processing unit
15 CPU 7, to which a display device 5, a GPS receiver 2, an input device 3, a system for giving guided information 6 and a data storage device 4 are operable and electronically connected. This means that the CPU 7 can retrieve information from the data storage device 4, can receive data from the GPS receiver 2, and can receive information from the input device 3 and combine
20 and process these data to generate a picture with eventual additional overlays on the display device 5. The Data storage device 4 comprises a GIS data storage division 12, a POI data storage division 13 and a quality parameter storage division 14. The storage divisions 12, 13 and 14 of the data storage device 4 can be for example separate files, separate records and/or separate
25 storage elements. The storage divisions can also be integrated in one database on one storage element, containing for instance records on each POI with separate data fields on waypoints, type of POI, address, one or more quality parameters and/or additional information.

The storage element can be equipped with a connector 19 that fits
30 and matches a connector 20 of a docking station 16 so as to be able to update

its contents. This way the data storage device can for example be exchanged and separately updated. This connector 19 can alternatively be integrated in the navigation device 1 itself. It can also be equipped with a power supply connector in order to recharge a battery (not shown) of the navigation device 1.

5 The docking station 16 can be connected to the internet. Through the internet information from a web server or other web accessible data storage devices, such as the latest information on the GIS can be downloaded.

The navigation device 1 can be equipped with a remote access device 15 like for instance a GSM telephone, a WIFI, a WLAN, a Bluetooth, infra red and/or other connection. The base stations of the remote access system can be connected to the internet, like e.g. the GSM system. This remote access device 15 can thus be an alternative or an addition to the connection through the docking station 16 and similarly update the data stored on the data storage element 4.

15 The input element 3 for entering information on a destination or POI, can comprise for example a key board, a touch sensitive screen, a remote control and/or a voice recognition element. With voice recognition, the navigation can be performed on a so called VEM (Voice Enabled Maps) basis. The input device can be equipped with a touch screen and/or any other input element. The touch screen can be integrated or overlaid over the display device so as to automatically select parts and/or elements displayed on the display device. The input device may, in car based navigation systems, also be integrated in for example a steering wheel or a dashboard.

25 The data storage element 4 can be a hard disk, a flash memory, a DVD, a RAM, ROM, DVD, CD, CD-ROM and/or other memory. The database contained by the data storage element 4 can be an electronic database or local GIS (Geographical Information System) 12 with detailed map information. In such map information databases data can be collected from electronically generated maps and continuously monitoring the GIS by a fleet of survey vehicles driving around to correct and/or collect geographically located

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infrastructural data, to be added to such databases, known as mobile mapping technology.

By this fleet of vehicles, not only the accuracy of location of the spatially available infrastructure can be measured, collected and stored in GIS's but also the average travel times of paths of motion can be deduced. From this data, being a grid of possible roads, each provided with specific additional travel speed data, a number of possible travel paths between a starting point and a destination can be calculated.

In modern currently available GIS besides the geographical infrastructural data and location and/or time related speed of traveling information, information about certain points of interest (POI's) is integrated as well. These points of interest can be selected by the user and can be displayed on the displayed map and/or in a list. The selection is based on type of POI only, the list being presented in a ranking on the basis of proximity. This POI data can be stored on the data storage device 4 in a separate file and/or integrated in the records of the waypoints in the GIS 12.

Points of interest can be amongst others: petrol stations, covered parking areas, hotels, restaurants, hospitals, pharmacies, cash dispensers, tourist information offices, museums, speed traps, traffic jams, public transport hiccups and/or panoramic view points. In multimodal transport, pedestrian crossings, walkways, bus, tram, train, and metro stations, airports might be interesting POIs or waypoints as well.

The display device 5 can be a screen or a projecting device. The display device 5 can project the image for instance on part of or on the whole windscreen of a car. The screen can be mounted in a car or can be a display screen of a hand held or palm top device. The screen can also be integrated in a mobile phone and/or another PDA device.

The system 6 for giving the guiding directions can for instance be a voice based guiding system. Similarly it can be a system giving an indication on the screen or other signal means for giving the information of direction to

the user in question. In order to give valuable direction information, the direction of motion of the user or, more specifically, the navigation device 1 first will be established. For example by applying differential positioning (d-GPS) using several consecutive point measurements of the position of the GPS receiver, a direction of motion can be deduced.

The central processing unit (CPU) 7 receives position information from the positioning element 2, such as a GPS receiver and it calculates the direction of motion from consecutive positions received from the positioning element 2. The position of the device 1 and its user is sent to the display device where it is depicted. The relevant and/or requested proximity based geographical information can be retrieved by the CPU from the GIS on the storage element 4 or from an external database and sent to the display device as well. The CPU 7 further can receive data input from the input element 3. This input element 3 for instance provides a destination such as an address of a desired destination. The CPU 7 retrieves from the GIS 12 on the storage element 4 the actual waypoint of the destination. From this information the CPU 7 starts to calculate a best track to the desired destination. This can for instance be based upon speed of travel, on the shortest track, type of roads desired or other preferences entered by a user and/or externally received traffic information such as traffic jams, road construction and the like. Furthermore the user can provide a POI that he/she is interested in, and the CPU 7 can retrieve the waypoint of the POI and (again) start calculating the best track. An iterative way of calculating the best track can be performed by retrieving from the GIS information on waypoints of a road, calculate the distance and the time to travel for possible tracks and select the possible best track. Such iteration can be statistically, with a maximal distance and travel time deviation truncations. These calculations can be basic grid travel statistical analysis's that are performed by the CPU 7.

A specific type of navigation device (ND) is the PND (Personal Navigation Devices). This can be a pocket version navigation device. It can

specifically be used as a PN (pedestrian navigation) although it can be used for other purposes, such as driver navigation, product location purposes or the like. This device can be equipped with e.g. a touch screen, key board and/or a VEM system. These devices can additionally be equipped with e.g. a calculator,
5 phone and/or other remote communication device 15, MP3/WMA player. The integrated GIS data can for instance be stored on a flash memory or a local hard disk and/or can be integrated in PDA (personal digital assistants)

To obtain real time navigation, besides the GPS receiver/clock-processor assembly for calculating the position, as a further element, the
10 information on the geographical position of infrastructure can be incorporated.

In navigation devices the geographical position of the device 1 calculated by the receiver/processor can be combined with data of a data storage device with the geographical infrastructural (GIS) data, for example a data base. Both the position and the map resulting from the geographical
15 infrastructural data can be depicted on a display device.

When the user of a navigation device starts to move, his direction of motion can be deduced from differential positioning using for instance d-GPS (differential Global Positioning System). As soon as the direction is accurately calculated the navigation device can use this location-direction and direction of
20 motion information to supply the user with an indication of a direction to follow in order to get to a predetermined destination.

Currently available GIS contain POI's specified by type and address. According to one aspect of the invention, additional information can be integrated in the GIS else than those location based services (LBS) like type of
25 POI and location. This additional information can be information about or at least one quality parameter relating to the POI and/or waypoint concerned. This quality parameter can be for instance a parameter on the quality of the service provided by the POI, the accessibility of the POI and/or the membership of the POI to one ore more clubs. The quality parameter based on
30 the membership can thus be for instance a Boolean e.g. member yes or no, it

can be a numeric value and present more information like the number of years that a member is in a membership program. It can alternatively also represent a membership number, for instance where the members are consecutively numbered upon entering the membership program. Alternatively the quality
5 parameter can be any other value or data set, for instance a picture, a text, and/or other information.

Besides the quality parameter, other POI specific information can be stored in the GIS as well. This can be pictures of a location concerned, moving 3d views, promotion films of the POI and/or other promotional material. In the
10 GIS also virtual guided tours can be inserted and/or integrated.

The POI's in a POI's overlay can for instance be made clickable. Thus the user-member can click on a depicted POI in order to retrieve additional relevant information about this specific POI. This can be information about for example a hotel, like number of beds, availability of
15 beds, other services provided, like WiFi available, swimming pool available, sauna and/or fitness available. For Museums or historical sites upon clicking the POI, for instance historic information can be provided, the current collections can be depicted in a short presentation and/or a three dimensional picture or movie can be played. Also a voice record can give a short summary
20 about the POI in question.

Updated information can be inserted by inserting the navigation device 1 or at least the data storage element 4 in a docking station 16 to get the new GIS downloaded. The download of new versions of GIS or the changes by online and/or remote access can be performed as well. This online and/or
25 remote access to a general information supplying system such as the internet can be achieved through a docking station 16, or through several specific means of remote access 15 like Bluetooth, Infra red transmission, GSM, UMTS and/or other services.

With an input element 3 and/or via the docking station 16 and/or via
30 said online and/or remote access 15 in a embodiment of a device 1 according to

the invention a user or other person or organization can be allowed to enter information about and especially a ranking of a POI based on a set of criteria that can for example be set by the provider of the navigation system 1, by a provider of a GIS database or can be set by a user, for example in a user profile
5 that can be entered in the device 1. Alternatively the navigation device 1 can be self learning in a sense that it ranks e.g. POI's, routes, types of routes or other elements or criteria in the database based on at least the actual choices made by a user in similar situations, such that the navigation system can predict a choice of a user or anticipate on a user's choices.

10 Alternatively the thus collected data may be returned through the remote access device 15 or through the docking station 16 to the data bases on the web servers 18 of the providers of the GIS, whereby the fleet of survey vehicles is virtually extended to any user. Accordingly even more accurate dynamic GIS can be obtained.

15 In an embodiment a POI visited can be judged upon and rated or ranked by the user by sending or answering for instance a short message. This ranking and feed back of the quality can also be performed by a voice recognition evaluation of POI's. This information can also or alternatively be fed into the GIS ranking or other quality parameter on a centralized web
20 server 18 directly. This way the parameters involved can become digitally dynamic quality parameters. The information can be send for instance through a remote communication element 15 of the navigation device 1. Alternatively, it can for example be sent by a separate mobile telephone.

 In a system according to the present invention in an embodiment a
25 GIS can be provided which is or comprises a dynamic database, in which users and/or suppliers can enter dynamically information about POI's, waypoints, routes, traffic information and other GIS relevant data, such that the database is kept up to date approximately continuously.

 An alternative embodiment of the invention is a method of finding
30 points of interest (POI's) having the following steps: Providing a navigation

means having storage means for storing a geographical information system; positioning means for deriving the exact location of the navigation device and display means for displaying the location of the device; providing a graphical information system within the navigation means containing data of an
5 electronic road map providing data concerning the location and type of points of interest; providing at least one quality parameter for each of the points of interest; depicting on the displaying device a location specific map, based on the geographical information system; and depicting a predetermined number of POI's, based on a high score of a ranking based on the at least one quality
10 parameter of the POI's. These steps can be performed in the above given order or in any other order, wherein one or several steps can be repeated.

The dynamic GIS can be stored on a file server 18 or any other remotely accessible storage device such as an internet accessible data storage device or memory system. This storage device can for example be accessed
15 through a website as user interface through which information can be added on for example the POI's in question. This information can for instance be added on a free "access to all system" like the Wikipedia. Alternatively its access can also be for user-members only, as will be explained later on. Rankings concerning one or several parameters can be inserted as well. These
20 Parameters might be for instance based on the quality of a service provided, the accessibility, the parking space in the surroundings of the POI, the quality of the drinks provided, the atmosphere of the location and/or other parameters, or user specific parameters such as brand preference, route preference or the like. These parameters can for instance be used in truncation of a number
25 and/or order and/or manner of display of POI's displayed for a specific user.

After a download of the central GIS system in the navigation device
1 the new ranking can be made available to a user of the device 1. It thus depends on the user how accurate his local GIS is, compared with an available real time updated version, for example on the Internet. Alternatively, the
30 update can also be real time through a continuous data exchange through for

instance a GSM, Bluetooth, infra red or other remote data exchange system and/or other connection.

Additional information or setting a quality parameter on POI's in the GIS database or retrieving such from the GIS database can be based on a
5 membership of a club.

Operators and/or owners of a POI can become provider-members of said club. These provider-members can be depicted in a highlighted way on the POI overlays on the display device of the navigation device. New POI's can for instance be suggested as new provider-members of the club by a user of the
10 GIS. These new POI's can for instance be added using the actual address (NAP) data or a GPS signal or a special program running on the CPU 7 for automatically generating a message such as an SMS through for instance a remote communication element 15. Such message can contain the exact waypoint of the POI concerned and/or other specific information. The operators
15 of the GIS or providers of the club can then for example contact the owners and/or operators of the POI to integrate it in their GIS and/or membership program. This new POI information can also be provided by drivers of or automatically by a system in cars of the maintaining and checking fleet of the GIS supplier.

20 Users of a navigation device 1 can become user-members of the club. The user-members can for instance collect points or other loyalty program based benefits when using facilities of provider-members of the club depicted by their navigation device 1 as POI. A frequent user program can also give the users an additional status, like for instance gold or platinum members, being
25 given certain privileges.

The membership program can also be adapted such that additional benefits can be collected for giving an opinion and/or ranking of a POI in a dynamic POI quality database, which can be part of or can be separate from the dynamic GIS database. Benefits can for instance be price reductions in
30 POI's, additional features on their navigation device and/or other rewards

offered by for example POI's, the club or a GIS or POI database operator. The system can further provide the provider-members a unique set of data about the behavior of their (potential) customers by retrieving data concerning POI's visited by the users concerned. This collection of user specific data can help the
5 owner/operator of the POI concerned to further tune his service towards his target clients. Thus a strong feed back is generated to the provider-members. The membership can be confirmed with a membership pas, a member specific code, a members only activated chip or otherwise. The members only activated chip can be integrated in the navigation device 1, a mobile telephone, can be
10 part of an identification card, a bank card, a credit card or other cards or a product.

A membership program, such as that of a club, can for example give one or more of the following advantages. The PND can become (a real time) search engine, wherein the PND can be used to search for relevant information
15 about restaurants, hotels, highway service stations, attractions, scenic viewpoints, shops, shopping malls and the like. The thus retrieved information can be more relevant to the user than in prior art navigation devices 1 or systems, in which information is ranked based on proximity of a POI only and the information is restricted to NAP only. A model of adwords and pay per
20 click can be integrated in the system as well, being an additional source of income for provider-members. In such system additional ads can be placed among the searched results.

A POI depicted in the graphical overlay on a navigation device 1 can be selected upon the at least one quality parameter. Such quality parameter
25 can be based upon a membership of a club and can be depicted in a certain predetermined color or otherwise be highlighted. In case the quality parameter forms the basis for a ranking, in an embodiment of the invention only a limited number, for instance only the top five most proximate POI's within this ranking may be depicted. In these ranking criteria a distance can be
30 integrated as well. This can for instance be performed using a weighing factor.

The user of the navigation device can indicate how important the proximity in relation to one or more quality parameters is and the weighing factor can be generated on the basis of the indicated relative importance. Also can this weighing factor be linearly dependent on the distance between the POI
5 concerned and the user (proximity). It can also be integrally and/or derivatively related to that distance. Thus for instance on a distance up to 10 kilometer and/or 15 travel minutes all POI's may be displayed. The ranking can thus be partly based on proximity and partly on other quality parameters. Furthermore the user can indicate a maximum skip distance in distance
10 and/or in travel time. This skip distance is to be understood as the maximum distance within which the POI's are to be displayed, any more remote POI's are skipped from being displayed. This skip distance can be based on the actual distance, the distance to travel or the time needed to arrive at the POI in question.

15 This way a user can select his own set of data in selecting POI's. This personal set of criteria can be locally stored on the data storage device 4 within the navigation device 1, it can also be centrally stored on a web accessible server 18 or other remotely accessible storage means. In the latter case the user can use virtually any navigation device 1 and download his
20 personal preferences into the device 1. This can be preferential if the user-member in question has for instance rented a car with a fixedly installed navigation device 1. The user can then download his personal settings into the relevant device 1. Alternatively his personal settings can also be stored in a mobile phone and be transferred to the navigation device 1 in question through
25 for instance blue tooth or through an infra red connection.

The criteria for depicting POI's on the display device can further be that only those POI's are depicted that are provider-members. The criteria can alternatively be based on a specific ranking by a selected group of users. The user can for instance select on which other users' rating he wants to have his
30 quality parameters based. The user can also request that both provider-

members and non-members of the club are to be highlighted or otherwise visually distinct. The quality of the POI's concerned can for instance be rated by a number of stars, the number of stars being related to the above described quality parameters. Alternatively the quality parameter can also be based
5 upon visits of selected users or upon the total of visits of a predetermined group of user-members of a POI. A dynamic gross rating can thus be generated by the servers 18 on the bases of any predetermined group of users. This gross rating can be used as a dynamic quality parameter for ranking the POI's. The threshold of depicting POI's on the overlay on the display device 5 can be a
10 certain number of the highest ranked POIs, like for instance a top five of POI's.

A further advantage of a membership program according to the invention can be that users can, for example on the internet, for instance with a map server and/or a satellite picture overlay, plan their travels beforehand. On this map and/or satellite picture overlay the same or similar parameters
15 can be used to select and display potential POI's. Depending on the thus selected POI's a trip can be planned.

By the ranking and feed back of the user-members, a dynamic information and evaluation system of POI's can thus be generated. Both user-members and provider-members may pay a certain subscription, for keeping
20 thus generated databases of information dynamic, accurate and up to date. The once filled never corrected syndrome can herewith be avoided.

A navigation device 1 of the invention can become a real life search engine for finding only or mainly that information relevant for the user concerned. Benefits for the POI owner or operator can be that potential
25 customers are guided to their POI. Membership of POI's can urge the information to be up to date and accurate.

Normally users buy a specific navigation device and a starters kit GIS. In an embodiment of the invention users can additionally buy a membership to the dynamic parameter based GIS and/or club.

A traveler can, in an embodiment of the invention, get on-the-go relevant, accurate, high quality information about for example hotels, restaurants and other POI's through the navigation device 1. A membership program can at the same time make traveling more rewarding by offering
5 travelers discounts and reward miles at hotels and restaurants and other POI's that are member of the relevant club.

Accordingly the current invention provides a system that can provide accurate additional information based on one or a set of dynamic quality parameters on POI's. It further provides a database wherein the POI's
10 owners or operators can become members and/or the end users of the system can become members as well. Furthermore user specific selection can be made among the POI's depicted and/or listed on the PND, presenting the user a list of only relevant POI's. The system according to the invention does not suffer from affluent irrelevant information. In the prior art devices more and more
15 POIs are filled in the databases, whereby affluent irrelevant POI's are being depicted, especially in urban areas whereby the user specific, relevant POI's are lost as a needle in a haystack. In the system and the navigation device of the invention feedback on quality, service level, price level or other indicators and/or parameters can be given.

20 Another advantage of the invention is that the users can be assured about the safety of a POI being a provider-member. The additional information can for instance comprise a or a set of parameters concerning the safety of the POI, the safety of the surroundings or neighborhood of the POI. It can also have information on the POI having for instance an air port shuttle service.

25 A further advantage of the invention is that the system, the navigation device, the database, and/or the membership program can comprise additional information for elderly people, concerning the availability of lifts, higher toilets, higher beds, higher baths and/or other adaptations for aged and/or disabled people.

In any embodiment of the invention as described before numerous adaptations and modifications are possible. For instance the accuracy of the positioning of the navigation device can be increased. A further boost in the accuracy can be provided if the motion of the receiver itself is measured. This measurement can be performed by accelerometers which can supply the data of the acceleration and deceleration of the device. These devices can register turns in the road, traffic jams, crossings and the like. This information can be provided online to the dynamic GIS. It can thus become directly clear to other users where traffic jams occur. This data can further be valuable for correcting the maps in the GIS. For instance if users frequently cross a part where in the GIS no road is known, this is a strong indication that the map in the GIS needs to be updated.

Another way of enhancing the accuracy is by correcting the calculated position of the GPS receiver using a number of other techniques. The position of the device can for instance be corrected using earth based beacons. These earth based beacons can for instance be formed by the grid of base stations of mobile telephone networks.

These and other adaptations and modifications are possible without departing from the spirit and scope of the invention.

Claims

1. A method of navigation, using a navigation device, wherein preferences of a user are entered into the navigation device, wherein at least a destination is entered into the navigation system, whereafter a number of POI's is presented by the navigation device, whereby the POI's are at least partially selected based on proximity to the navigation device and at least one quality parameter entered previously into a database connected to or integrated in the navigation device.
2. A method of finding points of interest (POI's) having the following steps:
 - Providing a navigation means having storage means for storing a geographical information system, positioning means for deriving the exact location of the navigation device and display means for displaying the location of the device,
 - Providing a graphical information system within the navigation means containing data of an electronic road map,
 - Providing data concerning the location and type of points of interest,
 - Providing at least one quality parameter for each of the points of interest,
 - Depicting on the displaying device a location specific map, based on the geographical information system and
 - Depicting a predetermined number of POI's, based on a high score of a ranking based on the at least one quality parameter of the POI's.
3. The method according to claim 2, wherein the quality parameter is based upon a membership.
4. The method according to claim 2 or 3, wherein the predetermined number of POI's is depicted in an overlay on the depicted location specific map.
5. The method according to any of the claims 2-4, wherein the ranking is based upon a combination of the proximity and the quality parameter.

6. The method according to any of the claims 2-5, wherein the quality parameter comprises information on the POI selected from the group containing among others: information on the membership of the program, quality of the service level, additional pictures, historic information, additional services offered, moving 3d views, promotion films of the POI virtual guided tours and/or other promotional material.
7. The method according to any of the claims 2-6, wherein the depicted POI's are activatable by clicking thereon.
8. A device for the method according to any of the claims 2-7, wherein the device is a navigation device.
9. A computer program product whereby the program is stored on a data storage device and retrievable in the working memory of a central processing device, the computer program, when running on the processing device being able to retrieve GIS from a data storage device, receive a position of the device from a GPS receiver, project upon a display device a map based on the GIS, retrieve POI's data records from the data storage device, and generate an overlay with POI's on the map on the display device.
10. The computer program product according to claim 9 wherein the POI data record contains at least one data field containing a quality parameter.
11. The computer program product according to claim 10 wherein the quality parameter is based on a membership.
12. The computer program product according to any of claims 9-11, wherein the quality parameter comprises information on the POI selected from the group containing among others: information on the membership of the program, quality of the service level, additional pictures, historic information, additional services offered, moving 3d views, promotion films of the POI virtual guided tours and/or other promotional material.
13. The computer program product according to any of claims 9-12, wherein the depicted POI's are activatable by clicking thereon.

14. A database, suitable for providing POI information on an map wherein the database comprises a GIS and data records of POI's wherein the data record of the POI's comprise at least a data field comprising a quality parameter.
15. The database according to claim 14 wherein the POI data record further comprises a data fields comprising a waypoint and/or a POI type indication.
16. The database according to any of claims 14-15, wherein the quality parameter comprises information on the POI selected from the group containing among others: information on the membership of the program, quality of the service level, additional pictures, historic information, additional services offered, moving 3d views, promotion films of the POI virtual guided tours and/or other promotional material.
17. The database according to any of claims 14-16, wherein the depicted POI's are activatable by clicking thereon.
18. A navigation device having a screen and/or projecting device whereon a location based map can be displayed on which an overlay of POI's can be positioned wherein the POI's are selected, highlighted and/or ranked based on a quality parameter.
19. The navigation device according to claim 18, wherein the quality parameter comprises an indication of a membership.
20. The navigation device according to any of claims 18-19 wherein the quality parameter further comprises additional information on the POI selected from the group containing among others: quality of the service level, additional pictures, historic information, additional services offered, moving 3d views, promotion films of the POI virtual guided tours and/or other promotional material.
21. The navigation device according to any of claims 18-20 wherein the depicted POI's are activatable by clicking thereon.

22. The navigation device according to any of claims 18-21, wherein a user-member can provide at least one quality parameter based upon an evaluation of the POI.
23. The navigation device according to any of claims 18-22, wherein a processor is provided suitable for depicting POI's selected upon a combination of proximity and the at least one quality parameter.
24. The navigation device according to any of claims 18-23, wherein the a processor is provided for selecting POI's to be depicted based at least partially upon weight factors set by a user.
25. The navigation device according to claim 24, wherein the weight factors can be linearly proportional, differentially proportional or integrally proportional to the distance between the user and the POI.
26. The navigation device according to any of claims 18-25, wherein a skip distance can be set by the user concerning a maximum distance of the POI's depicted.
27. The navigation device according to any of claims 18-26, wherein the POI's can be depicted upon a maximum set travel time.
28. The navigation device according to any of claims 18-26, having a GPS receiver, a display device, at least one data storage device containing GIS and POI information, wherein the GPS receiver, the display device and the data storage device are electronically and operable connected to a computer and/or processing unit, the digitally available POI information being stored in data records in a database on the at least one data storage device within the personal navigation device, the POI record containing at least data fields for at least one of geographic data, for indicating the type of POI, for the name of the POI and/or other data fields.
29. A method of projecting an electronically retrievable map on a display device comprising the steps of:
- providing a display device;
 - providing a GIS;

- providing a POI database;
- selecting on the basis of the location of the display device a part of the GIS proximate to the display device;
- displaying the map based on the proximate GIS part on the display device;
- overlying additional information from the POI database, wherein the POI's are selected, highlighted and/or ranked based on a quality parameter.

30. A method of ranking points of interest based on at least one quality parameter, wherein the point of interest can be displayed on a navigation device, depending on and/or ranked according to the at least one quality parameter.

31. The method according to claim 30, wherein the quality parameter is based upon a membership.

32. The method according to claim 30 or 31, whereby the points of interests provide geographically based services and whereby members of a membership program can enter their specific rating of a point of interest, wherein this ranking is sent to a server, this server deducing from the ratings given a dynamic gross rating on the point of interest concerned.

33. The method according to any of claims 30-32, wherein the members can select a group of other members with a similar attitude and/or interests and to base the gross rating only on those specific members.

34. The method according to any of claim 30-32, wherein the quality parameter comprises information on the POI selected from the group containing among others: information on the membership of the program, quality of the service level, additional pictures, historic information, additional services offered, moving 3d views, promotion films of the POI virtual guided tours and/or other promotional material.

35. The method according to any of claims 30-34, wherein the depicted POI's are activatable by clicking thereon.

36. A computer program product suitable for ranking POI's on the basis of at least one quality parameter, the program when loaded on a processor of a

navigation device being able to select from a data base comprising data records with POI's stored on a data storage device, POI's based on a quality parameter and/or a proximity to the navigation device.

37. The computer program product according to claim 36, wherein the quality parameter comprises information on the POI selected from the group containing among others: information on the membership of the program, quality of the service level, additional pictures, historic information, additional services offered, moving 3d views, promotion films of the POI virtual guided tours and/or other promotional material.

38. The computer program product according to any of claims 36-37, wherein the depicted POI's are activatable by clicking thereon.

39. A membership program for providers and/or operators of POI's wherein providers and/or operators are provider-member wherein the provider-members can be specially highlighted or otherwise recognisable in a navigation device.

40. The membership program according to claim 39, wherein at least a number of users of the POI's are user-members.

41. The membership program according to any of claims 39-40, wherein users that become user-member have reductions to those POI's that are provider-members.

42. The membership program according to any of claims 39-41, wherein users become member upon buying a navigation device and/or upon buying an update of a GIS installed thereon and/or stored therein.

43. The membership program according to any of claims 39-42, wherein the users can earn discounts or loyalty points upon evaluating certain POI's that the user concerned has visited and/or used.

44. The membership program according to any of claims 39-43, wherein a quality parameter can be provided for each POI that comprises information on the POI selected from the group containing among others: information on the membership of the program, quality of the service level, additional

pictures, historic information, additional services offered, moving 3d views, promotion films of the POI virtual guided tours and/or other promotional material.

45. The membership program according to any of claims 39-43, wherein the depicted POI's are activatable by clicking thereon.

46. The membership program according to claim 44 or 45, wherein a POI database with the information concerning the POI is stored on a webserver or other storage device operable by the provider of the membership program.

47. A navigation device (1), having a GPS receiver (2), a display device (5) and at least one data storage device (4) containing GIS and POI information, wherein the GPS receiver (2), the display device (5) and the data storage device (4) are electronically and operable connected to a computer and/or processing unit (7) wherein a POI data record is provided containing at least one data field for data chosen from the group containing geographic data, POI type data, POI name data and other POI data, wherein the POI data record further contains at least one data field with at least one quality parameter wherein selected data of the POI records is retrievable by the processing unit (7) and depictable on the display device (5) and displayed at least on the basis of the at least one quality parameter.

48. The navigation device according to claim 47, wherein the at least one quality parameter of a POI contains an indicator concerning a membership.

49. The navigation device according to claim 47 or 48, wherein the at least one quality parameter of a POI further contains at least one dynamic quality parameter.

50. The navigation device according to any of claims 47-49 wherein the quality parameter further comprises additional information on the POI selected from the group containing among others: quality of the service level, additional pictures, historic information, additional services offered, moving 3d

views, promotion films of the POI virtual guided tours and/or other promotional material.

51. The navigation device according to any of claims 47-50 wherein the depicted POI's activatable by clicking thereon.

52. The navigation device according to any of claim 47-51, wherein the data storage device is selected from a group containing among others random access memory, read only memory, DVD, CD, CD-rom disks, hard disks, flash memory or other storage mediums.

53. The navigation device according to any of claims 47-52, wherein the selected data of a POI further comprises data based on proximity of the POI to the device.

54. The navigation device according to any of the claims 47-53, wherein the distance between the POI and the position of the navigation device is calculable by the processor and can be combinable with a weight factor multiplied with the at least one quality parameter.

55. The navigation device according to any of the claims 47-54, wherein the digital dynamic quality parameter is based upon a user evaluation of the users of the POI.

56. The navigation device according to any of the claims 47-55, wherein a set of digital dynamic quality parameters is stored in a set of data fields in a POI data record.

57. A database, comprising GIS data and POI data records, wherein the POI data records comprise way point data of the POI and wherein in at least a number of the POI data records at least one quality parameter of the POI is provided.

58. The database according to claim 57, wherein the database allows ranking of the POI's of which data records are comprised in the database, based on at least one of said at least one quality parameter.

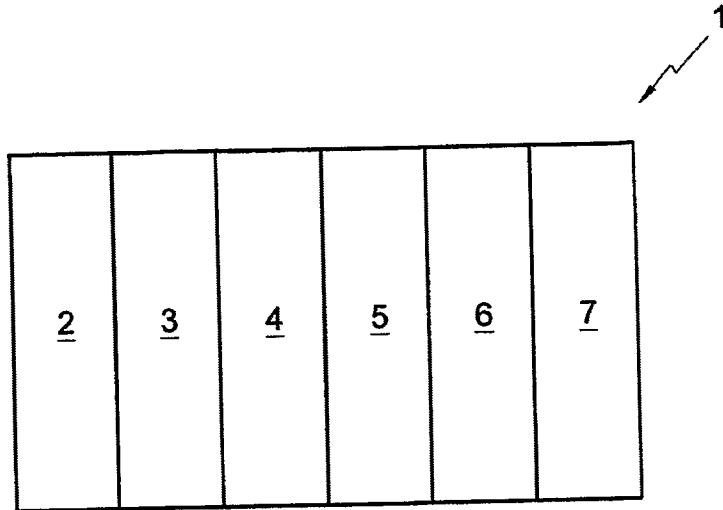


Fig. 1

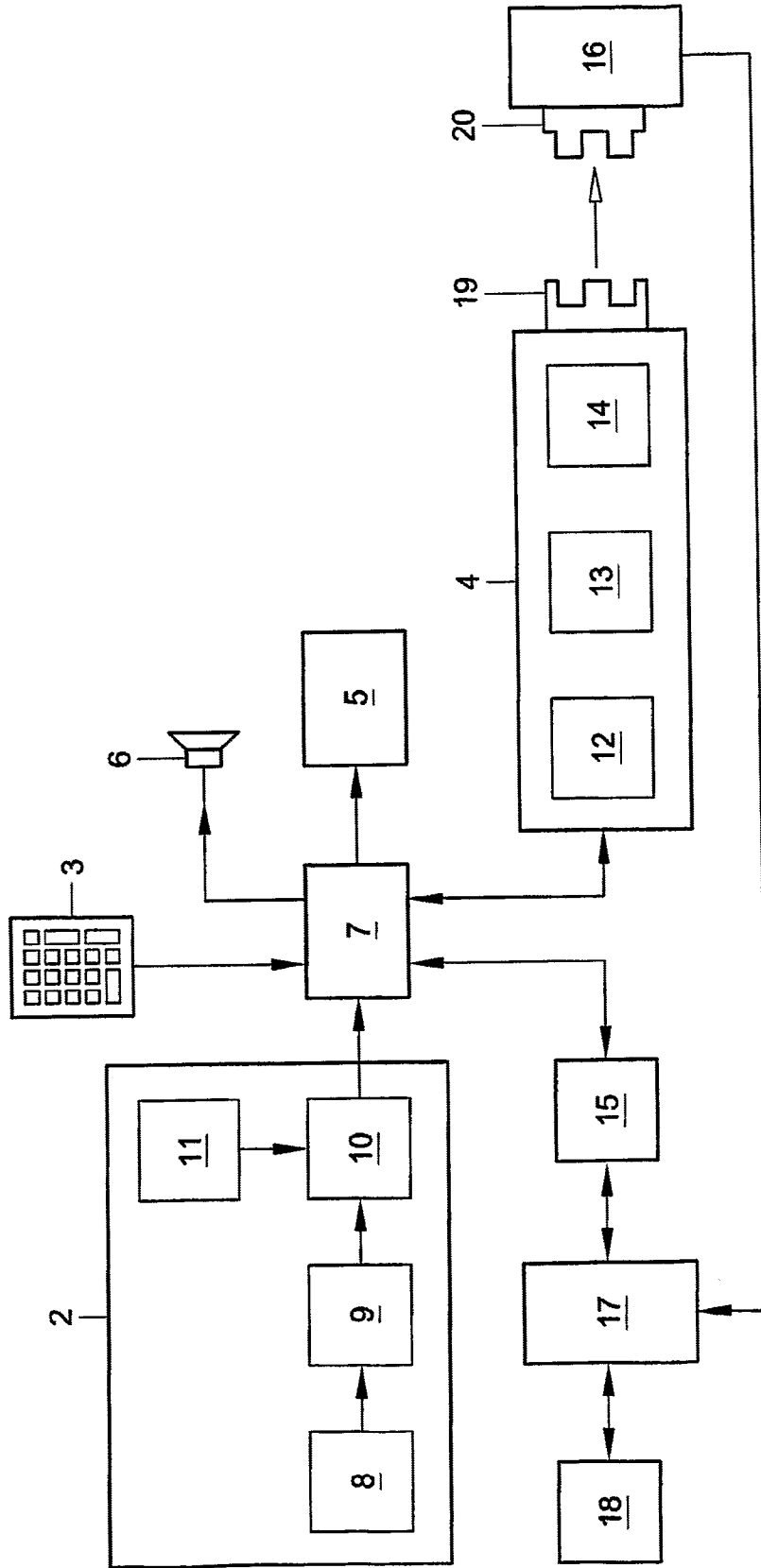


Fig. 2