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(54) **Integrated traffic and position data receiver**

(57)   The invention relates to a method for providing at least traffic data and position data from at least two sources to a handheld computer using one single interface, with obtaining the traffic data using a traffic data receiver, obtaining the position data using a position data receiver, and providing the traffic data and the position data to a message director. To prevent lock-ups on the interface, the invention proposes that the message director receives from the handheld computer via the interface instructions concerning which data to send to the handheld computer, the message director selects from the provided data the data to be send via the interface to the handheld computer according to the instructions, and the message director sends the selected data via the interface to the handheld computer.
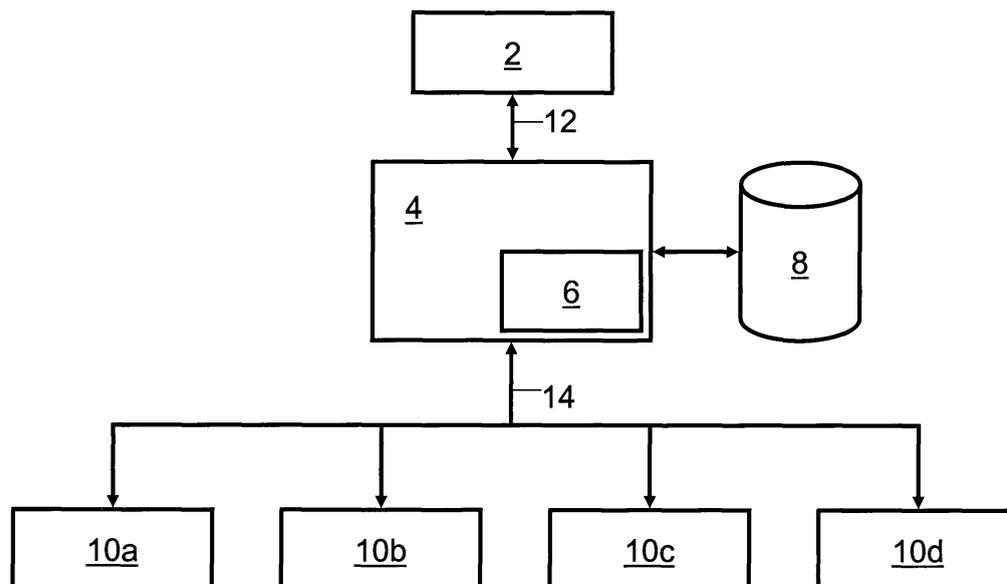
FIG. 1

EP 1 647 960 A1

Description

[0001] The invention relates in general to a method and a system for providing at least traffic data and position data from at least two sources to a handheld computer using one single interface.

[0002] It is known from current systems that handheld computers can be used in combination with navigation systems to provide users within navigation information. These systems are, for instance, known from DE 199 28 903 A1, wherein position data is received from a Global Positioning System (GPS) receiver and traffic data are received from an Radio Digital System (RDS) receiver or a Digital Audio Broadcast (DAB) radio receiver. This information is used within a handheld computer to provide users with navigation information.

[0003] In addition, from DE 198 28 077 A1 a navigation system for vehicles is known. In the described navigation system, a personal digital assistant (PDA) is connected with a GPS receiver and a CD-ROM device providing navigational data. Using this data, the PDA provides the user with navigation information.

[0004] From DE 100 11 702 A1 a handheld computer is known, which receives GPS signals using a appropriate receiver. This receiver provides position data. Further, a digital radio receiver provides traffic data. Both data is provided to the handheld computer, which uses this data to present the user navigation information.

[0005] The interface between the various devices and the handheld computer can, for instance, be a serial interface or a parallel interface. With regard which type of interface is used, current systems provide the handheld computer with the available data using one single interface. This one single interface allows using only one cable for connecting the various devices with the handheld computer. For instance, in vehicle navigation systems, users do not want to have a variety of different cables to be connected to the handheld computer, instead appreciate having only very few cables within the inside of the car.

[0006] However, the drawback of current systems is the limited bandwidth of the interface connecting the handheld computer with the various devices. In particular, when one central interface device is provided, connecting the various devices with the handheld computer via the serial interface, the connection between the interface device and the handheld computer needs to have a high bandwidth. For instance, when different components are connected to the interface device and all processes run at one time, they can generate more messages than the serial interface can handle at a single point in time. This may lead to jamming of the data stream.

[0007] To overcome these problems, the invention provides a method, wherein the message director receives from the handheld computer via the interface instructions concerning which data to send to the handheld computer, the message director selects from the provided data the data to be send via the interface to the hand-

held computer according to the instructions, and the message director sends the selected data via the interface to the handheld computer.

[0008] By providing a back-channel between the handheld computer and the message director, it is possible to provide the message director with instructions concerning which data to send to the handheld computer. For instance, a tuner, an RDS decoder, a GPS receiver, and/or a further command interpreter can be connected to the message director. The user or an application running on the handheld computer can select, which data is required. Additionally, an application might select, which data is required. According to this selection, instructions are send from the handheld computer to the message director informing the message director, which data to send via the interface back to the handheld computer.

[0009] According to the instructions received from user selections or an application within the handheld computer, the message director selects from the provided data the data which is to be sent via the interface to the handheld computer. Insofar, the selection within the handheld computer can be used to restrict, which data is send to the handheld computer. This restriction of data sent via the interface results in a reduced bandwidth required on the interface. Only data, which is actually required within the handheld computer, is transmitted via the interface, this data is most probably not jammed by unnecessary data. The selection within the message director is carried out according to the instructions. After the selection, the selected data is transported via the interface to the handheld computer. Within the handheld computer, the applications or the user can then use the requested data. As the data stream on the interface can comprise data of a plurality of sources, the handheld computer can comprise a decoding program, which decodes the data from the different sources into separate data streams.

[0010] According to embodiments, data form different data sources, such as, for instance, traffic data receivers, position data receivers, radio data receivers, multimedia data receivers, or command interpreters, can be assigned with priorities. These priorities decide which data is sent to the handheld computer at what time. Insofar, some data can be assigned a higher priority and be sent to the handheld computer prior to sending any other data. The lower priority data is only sent to the handheld computer via the interface in case bandwidth is available.

[0011] Embodiments provide using radio data, multimedia data, command data, or any other data. All this data can be provided using the respective receivers. Multimedia can, for instance, be as well any video or audio source, which is available within a vehicle. All this data can be obtained and sent via the serial interface to the handheld computer.

[0012] According to embodiments, the message director includes a filter. This filter enables filtering the data received according to the instructions. Insofar, the data received by the various receivers can be filtered and only the data which is required within the handheld computer

is sent via the interface.

[0013] A filter may also be arranged to allow filtering certain data from one of the received message streams. For instance, within data received from a traffic message channel (TMC) tuner, radio data and traffic data is available. The filter can be arranged to filter only the traffic data from this stream and to provide the handheld computer with the traffic data, only, and to discard the radio data. This allows using integrated receivers, which provide different type of data, for example radio data and traffic data. The data required within the handheld computer can be selected and filtered from the single stream provided by the respective receiver.

[0014] To allow selecting which data to filter and which data to send to the handheld computer, a message database providing information about the available data is provided. This message database can, for instance, comprise information, which channel contains which data of which receiver. The message director may then determine from the message database, which channel to select to provide the appropriate data according to the instructions.

[0015] Further, embodiments provide sending the information about the available data via the interface to the handheld computer. This enables the user or an application to select, which information it requires and then to send the instructions concerning data to be sent to the handheld computer via the interface back to the message director.

[0016] According to embodiments, the data send via interface is formatted into an NNMA standard. The National Marine Electronic Association (NMEA) standard allows sending position information within NMEA messages and further information within vendor specific time slots. Insofar, the GPS data can be included within the NMEA data stream. Further, additional data can be used within a vendor specific time slot of the NMEA stream. Such a message is in accordance with the NMEA standard. Insofar, within the handheld computer no extra driver besides a usual NMEA interpreter is necessary. The data does not need to be split within the handheld computer, but can be used by an appropriate navigation application directly. When used directly within a navigation application, which interprets the NMEA data stream, the additional data can be discarded.

[0017] The receivers providing the various data from the various sources can be connected to the message director via a data bus according to embodiments. Additionally, the sources can be connected using bi-directional interfaces with the message director. Either way, each data source can be identified within the message director by an interrupt or a socket. This interrupt or socket can be used to allocate the data within the data bus or the bi-directional interfaces and to filter the data to be used.

[0018] Another aspect of the invention is a system arranged for providing at least traffic data and position data from at least two sources to a handheld computer using one single serial interface, with a traffic data receiver ar-

ranged to obtain the traffic data, a position data receiver arranged to obtain the position data, and a message director arranged to receive the traffic data and the position data, characterized in that the message director is arranged to receive from the handheld computer via the serial interface instructions concerning which data to send to the handheld computer, the message director is arranged to select from the provided data the data to be send via the serial interface to the handheld computer according to the instructions, and the message director is arranged to send the selected data via the serial interface to the handheld computer.

[0019] The system can be arranged according to embodiments, such that the message director comprises a filter arranged to prioritize data from the received data according to the instructions and that the message director is arranged to send the data to the handheld computer according to their priority.

[0020] According to embodiments, the filter within the message director is arranged to filter the data received according to the instructions.

[0021] According to other embodiments the filter within the message director is arranged to filter one of the received message stream data to be sent to the handheld computer.

[0022] In accordance with further embodiments a radio data receiver arranged to obtain radio data and to provide the radio data to the message director is provided.

[0023] A multimedia data receiver arranged to obtain multimedia data and to provide the multimedia data to the message director is provided according to further embodiments.

[0024] A command interpreter arranged to obtain command data and to provide the command data to the message director is also provided.

[0025] The message director is arranged to receive the data within a data stream according to embodiments.

[0026] According to further embodiments a message database arranged to provide information about the available data is provided.

[0027] Further embodiments provide connecting the message database to the message director via an interface.

[0028] The message director is arranged to provide the information about the available data from the message database via the interface to the handheld computer according to embodiments. Also, the message director can be arranged to send the data via the interface to the handheld computer using an NMEA standard. In addition, the message director can be arranged to receive the data via a data bus. Further the message director can be arranged to receive the data via dedicated bi-directional interfaces.

[0029] These and other embodiments will be apparent from and elucidated with reference to the following figures.

In the figures show:

[0030]

Fig. 1   a system according to embodiments;

Fig. 2   a flowchart of NMEA messages.

[0031]   Figure 1 shows a system arranged for implementing the inventive method. Illustrated are a handheld computer 2, a message director 4, a filter 6, a message database 8, and data sources 10. Further depicted is a serial interface 12 and a data bus 14.

[0032]   A data source 10 provide data with various content to message director 4. The data sources 10 may, for instance, be a tuner 10a, an RDS/TMC decoder 10b, a GPS decoder 10c, or a command interpreter 10d. The command interpreter 10d can connect various different devices to data bus 14, for instance a keyboard, a multimedia device, a mouse or any other.

[0033]   The data from the data sources 10 can be transmitted to the message director 4 using the data bus 14. Data bus 14 can be a broadband data bus, which is capable of transporting a high volume of data. The data bus 4 can, for instance, be a parallel data bus. The data bus 14 can as well be provided by a plurality of connection cables, each being connected to the message director 4, respectively. The data from the sources 10 is received within the message director 4 within different sockets. These sockets allow determining, which data belongs to which source. The sockets can as well be implemented using dedicated interrupts.

[0034]   The message database 8 is connected to the message director 4 and provides the message director 4 with information about available data sources. The message database 8 may also carry information, which socket or which interrupt the available data can be received from. The information about the available data from message database 8 can be sent via message director 4 and interface 12 to handheld computer 2. Within handheld computer 2, the available data can be presented to a user or to an application.

[0035]   The user or the application can decide which data is required or desired. The user or application selection can be sent back via interface 12 to message director 4. This selection is interpreted within the message director 4 as instructions concerning data to be sent via interface 12 to handheld computer 2.

[0036]   The instructions are fed to filter 6. Using the instructions, which data to send and which data to block, the filter 6 can decide, which data is used from data bus 14 and provided via interface 12 to handheld computer 2. Filter 6 allows multiplexing the data onto interface 12, as will be described in conjunction with Figure 2.

[0037]   Additionally, filter 6 can use the instructions to apply priorities to the data received on data bus 14. These priorities can be used to decide, which data is to be sent next via interface 12 to handheld computer 2. Data with low priority may be stored intermediately in a file and may be sent later, when no other data with a higher priority is to be send.

[0038]   The filter 6 and the message director 4 provide sending only required data via interface 12 to handheld computer 2. Further, as only required information is send via interface 12, lock-ups or jamming due to too much data on the interface 12 can be prevented. Interface 12 can be any interface, such as an infrared interface, an RS232 interface, an USB interface, a firewire interface, or even an interface supporting wireless communication, such as Bluetooth or W-LAN.

[0039]   Figure 2 shows a NMEA stream 20. The NMEA stream 20 is comprised of time slots 24 carrying usual NMEA data. The NMEA data within time slots 24 can, for instance, comprise position information, which has been received using a GPS-receiver.

[0040]   To allow transporting additional information besides position information, the NMEA protocol provides vendor specific time slots. Figure 2 depicts a data stream 22 using common NMEA time slots 24 and vendor specific time slots 26. The vendor specific time slots 26 can be used to transport, for instance, traffic message channel data. The data stream 22 insofar provides besides position information within type slots 24, traffic information within time slots 26. Time slots 26 may as well be used for transporting any further data from different sources.

[0041]   As can be seen, the vendor specific time slots 26 allow transporting only a limited amount of data. Therefore, the inventive method proposes to limit the data send within data stream 22 via interface 12 by filtering out data which is not required. The data required can be selected and instructions concerning which data to be sent can be used within the message director. Within the message director the vendor specific time slots 26 are filled with the data required. The inventive data stream 22 prevents lock-ups on interface 12 and provides a constant data stream to handheld computer 2. This ensures that position information is available constantly and additional information is available in case the interface 12 allows data to be sent.

Claims

1. Method for providing at least traffic data and position data from at least two sources to a handheld computer using one single interface, with

    - obtaining the traffic data using a traffic data receiver,
    - obtaining the position data using a position data receiver, and
    - providing the traffic data and the position data to a message director,

    wherein

- the message director receives from the handheld computer via the interface instructions concerning which data to send to the handheld computer,

- the message director selects from the provided data the data to be send via the interface to the handheld computer according to the instructions, and

- the message director sends the selected data via the interface to the handheld computer.

2. The method of claim 1, with prioritizing data from the received data according to the instructions and sending the data to the handheld computer according to their priority.

3. The method of claim 1 or 2, with filtering within the message director the data received according to the instructions.

4. The method of any one of claims 1 to 3, with filtering within the message director from one of the received message streams data to be sent to the handheld computer.

5. The method of any one of claims 1 to 4, with obtaining radio data using a radio data receiver and providing the radio data to the message director.

6. The method of any one of claims 1 to 5, with obtaining multimedia data using a multimedia data receiver and providing the multimedia data to the message director.

7. The method of any one of claims 1 to 6, with obtaining command data using a command interpreter and providing the command data to the message director.

8. The method of any one of claims 1 to 7, with providing the data to the message director within a data stream.

9. The method of any one of claims 1 to 8, with providing a message database providing information about the available data.

10. The method of claim 9, with providing the information about the available data via the interface to the handheld computer.

11. The method of any one of claims 1 to 10, with sending the data via the interface to the handheld computer using an NMEA standard.

12. The method of any one of claims 1 to 11, with providing the data to the message director via a data bus.

13. The method of any one of claims 1 to 11, with providing the data to the message director using dedicated bi-directional interfaces.

14. System arranged for providing at least traffic data and position data from at least two sources to a handheld computer using one single interface, with

- a traffic data receiver arranged to obtain the traffic data,

- a position data receiver arranged to obtain the position data, and

- a message director arranged to receive the traffic data and the position data,

characterized in that

- the message director is arranged to receive from the handheld computer via the interface instructions concerning which data to send to the handheld computer,

- the message director is arranged to select from the provided data the data to be send via the interface to the handheld computer according to the instructions, and

- the message director is arranged to send the selected data via the interface to the handheld computer.
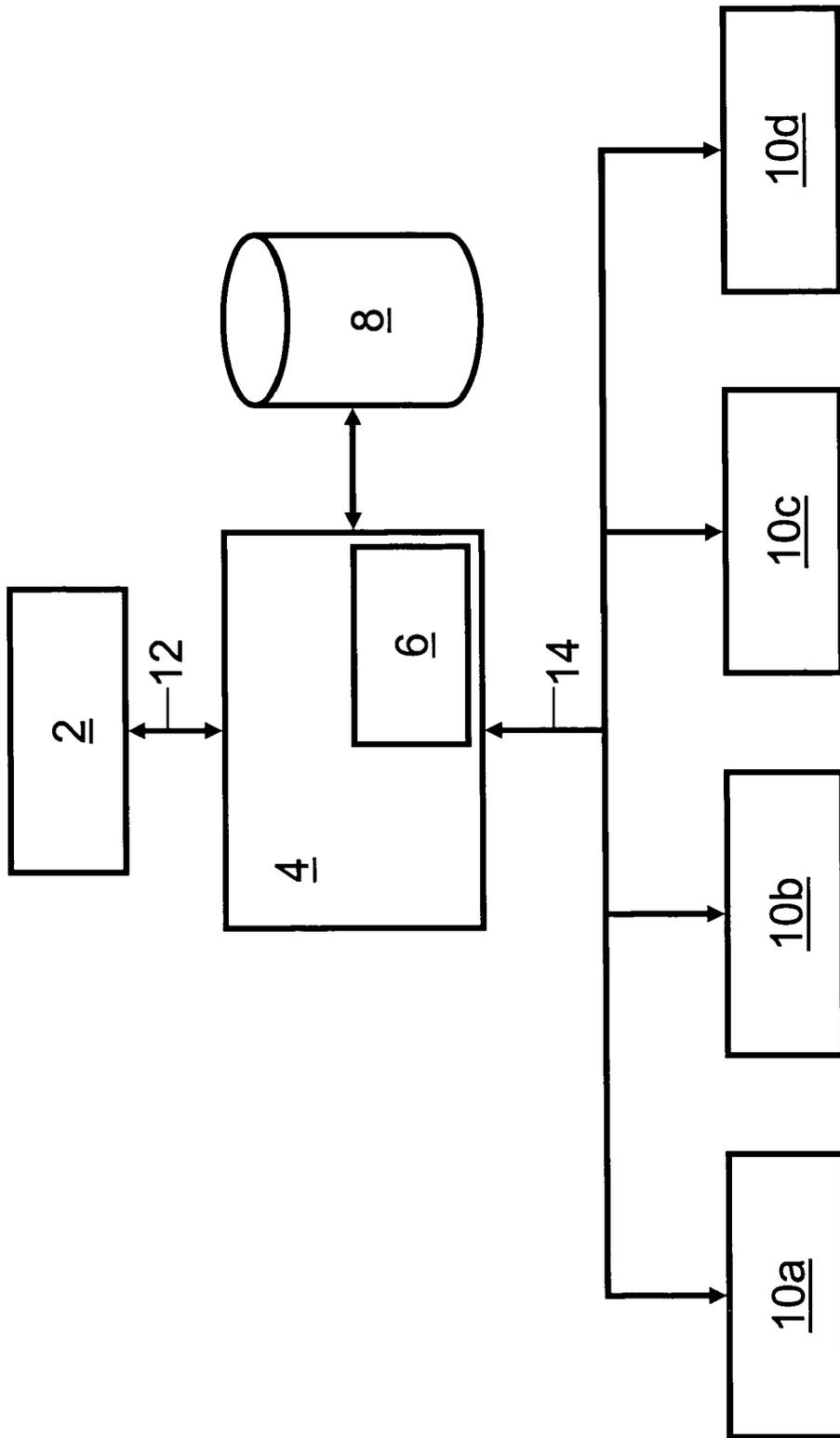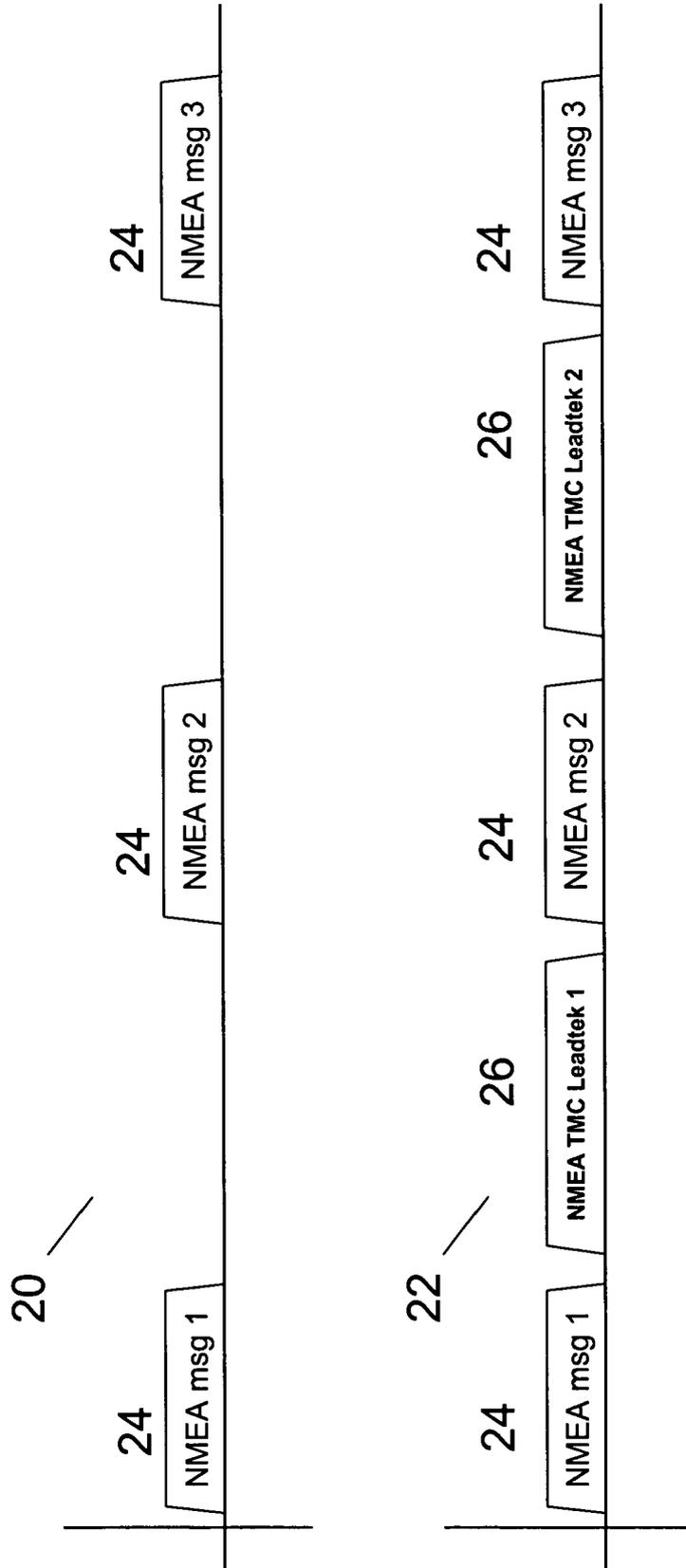
FIG. 1

FIG. 2

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 04 02 4695

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X	US 2003/163251 A1 (OBRADOVICH MICHAEL L ET AL) 28 August 2003 (2003-08-28) * page 1, paragraphs 7,10 * * page 8, paragraph 101 * -----	1-14	G08G1/0969
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TECHNICAL FIELDS
SEARCHED   (Int.Cl.7)

G08G
G01C
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	17 March 2005	Coffa, A

CATEGORY OF CITED DOCUMENTS

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