(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 244 231 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
27.10.2010 Bulletin 2010/43

(51) Int Cl.:
G07C 3/14 *(2006.01)*

(21) Application number: **09425154.3**

(22) Date of filing: **23.04.2009**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA RS

(71) Applicant: **Graf S.p.A.**
41015 Nonantola (MO) (IT)

(72) Inventor: **Ferranti, Giampaolo**
41015 Nonantola (Modena) (IT)

(74) Representative: **Baroni, Matteo**
Bugnion S.p.A.
Viale Lancetti, 17
20158 Milano (IT)

(54) **System for monitoring structures**

(57) A system for monitoring structures, comprising: a short-range reading device (20) adapted to read from identification devices (30a, 40a, 50a) associated with structures (30, 40, 50), detection data (DD) identifying at least one of said structures (30, 40, 50); data input means (71) to enable an operator to input monitoring data (MD) relating to said at least one structure (30, 40, 50) into said system; storage means (12; 30b, 40b, 50b, 120) operatively associated with said data input means (71) for storing said monitoring data (MD).

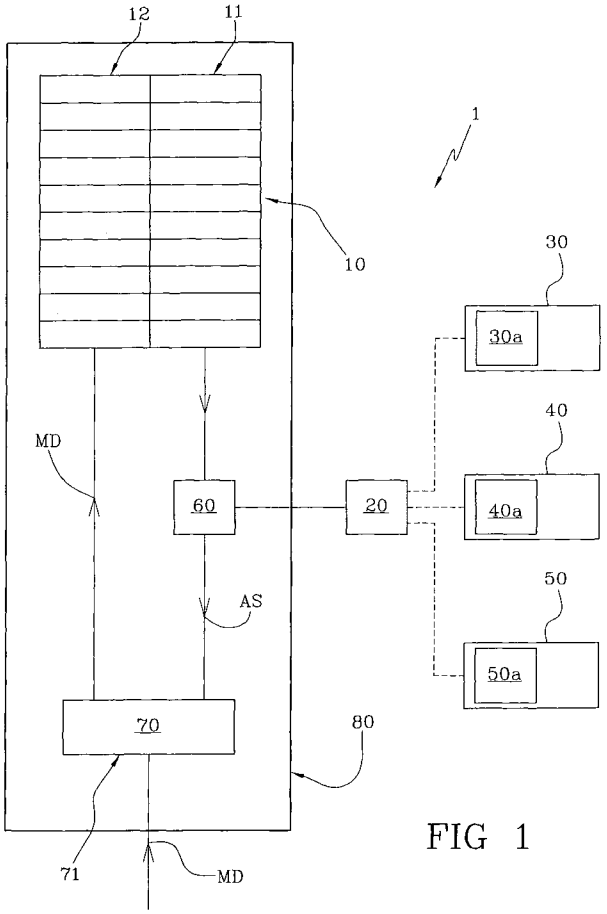


FIG 1

EP 2 244 231 A1

Description

[0001] The present invention relates to a system for monitoring structures.

[0002] These structure can be safety structures present within a given environment, relating to a working activity for example, such as a factory or an office. It is however to be noted that the invention is also applicable to any other type of structure requiring periodic control, inspection/verification and/or maintenance operations.

[0003] It is known that at the inside of working environments, such as offices, workshops, factories, etc., periodical safety controls are required to be carried out in order to verify whether the different structures present in said environments are in compliance with the regulations in force and can have suitable features for facing danger or alarm situations. By way of example, these controls must be performed on extinguishers, fire hoses, emergency exits, etc.

[0004] Presently, those who are in charge of said controls, who can be either employees/workers of the firm operating in the monitored environment or external professional men, go to the different areas to be controlled being equipped with paper forms to fill in or with portable computers, take due note of the different inspections they have carried out and finally draw up suitable reports.

[0005] Depending on the contents of these reports, the firm that is responsible for the environment in question will be able to take the appropriate measures, carrying out renovation works or modifications to its safety structures, for example.

[0006] However there is no certainty as to the fact that the operators drawing up the above mentioned reports do really go to the different structures that are to be examined.

[0007] It may happen in fact that for the most different reasons, the reports on the safety structures are filled in based on fictitious data and the results exhibited do not correspond to the real situation of these structures.

[0008] This clearly involves very high risks from a practical point of view, should malfunctions, danger situations, etc. occur, since there is no certainty that the different structures in these difficult situations will have a suitable behaviour.

[0009] Accordingly, it is an aim of the present invention to make available a system for monitoring structures enabling more efficiency and reliability in the safety controls carried out.

[0010] Another aim of the invention is to provide a system by which the inspection operations on the structures to be monitored are simplified and automated.

[0011] The foregoing and further aims are substantially achieved by a system for monitoring structures in accordance with the features recited in the appended claims.

[0012] Further features and advantages will become more apparent from the detailed description of a preferred but not exclusive embodiment of the invention.

[0013] This description is taken hereinafter with reference to the accompanying drawings, given by way of non-limiting example, in which:

- Fig. 1 is a block diagram of a first part of the system in accordance with the invention;
- Fig. 2 is a block diagram of a second part of the system according to the invention;
- Figs. 3 and 4 show alternative embodiments of the system of the invention.

[0014] With reference to the drawings, a system in accordance with the invention has been generally identified by reference numeral 1.

[0015] System 1 is utilised for monitoring structures 30, 40, 50. These structures 30, 40, 50 can be, by way of example only: extinguishers, fume/gas detecting plants, hydrants, fire hoses, REI-certification doors (i.e. doors having particular mechanical features, tightness features for preventing fume passage, and heat insulation features) sprinkler plants, fire-fighting devices and first aid devices, emergency lights and buttons, emergency exits, etc.

[0016] More generally, structures 30, 40, 50 can consist of any type of structure requiring preferably periodical, control, inspection and/or maintenance operations.

[0017] In the present context reference will be made to three structures 30, 40, 50; however, the invention is also applicable to any number of structures that are to be monitored.

[0018] System 1 first of all comprises a reading device 20 adapted to read data stored in identification devices 30a, 40a, 50a.

[0019] Preferably, the identification devices 30a, 40a, 50a are electronic devices; in particular, each identification device 30a, 40a, 50a can comprise a RFID (Radio Frequency IDentification) tag. Preferably, the reading device 20 is a RFID reading device.

[0020] Alternatively, the identification devices 30a, 40a, 50a can for instance be magnetic bands, media on which bar codes are reproduced, etc.

[0021] It should be noted that the identification devices 30a, 40a, 50a can consist of any device capable of containing or representing at least one identification code that, as more clearly explained in the following, is associated with a respective structure 30, 40, 50.

[0022] Preferably, each identification device 30a, 40a, 50a is uniquely associated with the respective structure 30, 40, 50.

[0023] Therefore, the reading device 20 has a structure and operation adapted to read the codes represented by the identification devices 30a, 40a, 50a.

[0024] Generally, the reading device 20 is able to read the contents of one of the identification devices 30a, 40a, 50a, only if positioned to a distance therefrom smaller than 1 metre, and preferably smaller than 0.5 metres. In other words, the operator in charge of the controls, who uses the reading device 20 must necessarily go close to an identification device 30a, 40a, 50a for being able to

carry out reading. Therefore, the reading device 20 is adapted to carry out short-range readings, i.e. readings to a closely spaced distance.

[0025] Advantageously, the reading device 20 is a portable device provided with an independent electric power, that therefore does not require connections cabled to the supply mains.

[0026] The reading device 20 further has a shape and weight making it adapted to be easily carried by a user, such as the operator entrusted with the task of monitoring structures 30, 40, 50.

[0027] Each identification device 30a, 40a, 50a is associated with a respective structure 30, 40, 50. In particular, each identification device 30a, 40a, 50a contains identification data of the respective structure 30, 40, 50. By way of example, each identification device 30a, 40a, 50a can contain an identification code uniquely associated with the structure associated with such a device.

[0028] Each identification device 30a, 40a, 50a is positioned close to the respective structure 30, 40, 50. Preferably, each identification device 30a, 40a, 50a can be directly mounted on the respective structure 30, 40, 50, preferably by gluing.

[0029] Advantageously, the identification devices 30a, 40a, 50a can be directly formed on adhesive labels, that are applied to structures 30, 40, 50 or in the vicinity of same in a quick and simple manner.

[0030] The reading device 20 is adapted to read detection data DD identifying the respective structures 30, 40, 50 from the identification devices 30a, 40a, 50a.

[0031] Preferably, system 1 further comprises a portable apparatus 80, configured for co-operating with the reading device 20. The portable apparatus 80 for instance, can be an electronic apparatus of the Personal Digital Assistant (PDA) type, a Tablet PC, a portable computer, etc.

[0032] Generally, the portable apparatus 80 has a shape and weight making it adapted to be easily carried by a user, such as the operator entrusted with the task of monitoring structures 30, 40, 50.

[0033] System 1 further comprises data input means 71 to enable an operator to input monitoring data MD relating to structures 30, 40, 50 into the system itself. As better clarified in the following, the data input means 71 can be implemented in different embodiments.

[0034] Preferably, the data input means 71 is integrated into said portable apparatus 80.

[0035] System 1 further comprises storage means 12, 30b, 40b, 50b, 120 operatively associated with said data input means 71 to store the monitoring data MD.

[0036] As it will be more apparent in the following, the storage means can be physically positioned in different manners, depending on the type of system accomplished.

[0037] Taking into account the hitherto described technical features of system 1, it is apparent that the operator must go close to structure 30, 40, 50 for being able to operate with the short-range reading device 20, and then having the possibility of inputting and storing the detected data, or monitoring data MD, as a result of the carried out control.

[0038] System 1 can have different embodiments, all falling within the scope of the present invention. These embodiments are hereinafter described by way of mere illustration and not of limitation.

[0039] In the first embodiment, system 1 comprises different components; diagrammatically shown in Fig. 1 are some of them, while shown in Fig. 2 are some of the components present in Fig. 1 together with other components not shown in Fig. 1.

[0040] Preferably, the component combination shown in Fig. 1 is used in operating steps that are different from the steps relating to the component combination shown in Fig. 2, as better clarified in the following.

[0041] As can be viewed from Fig. 1, the portable apparatus 80 comprises a memory 10, that in turn includes at least one first register 11; stored data SD identifying structures 30, 40, 50 are contained in the first register 11.

[0042] The first register 11 can be imagined like a column having different rows and stored in each row is an identification code of a respective structure.

[0043] Preferably, the portable apparatus 80 further comprises a processing unit 60, operatively associated with the memory 10 and reading device 20.

[0044] Advantageously, communication between the reading device 20 and processing unit 60 takes place through respective wireless modules, such as Bluetooth® modules. In this way the reading device 20 and processing unit 60 can co-operate when placed to a reduced distance from each other, but at the same time can be handled in an independent manner.

[0045] Alternatively, the reading device 20 can be directly integrated into the portable apparatus 80.

[0046] The processing unit 60 carries out a comparison between the stored data SD stored in memory 10 and the detection data DD received through the reading device 20.

[0047] In particular, the processing unit 60 sequentially takes into account each identification code stored in each row of the first register 11, and compares it with the detection data DD, that could be representative of a given structure 30, 40, 50.

[0048] Should a matching occur, i.e. should the detection data DD find a match in one of the rows of the first register 11, the operator is given the possibility of inputting the monitoring data MD.

[0049] In other words, if the identification device 30a, 40a, 50a that is read by the reading device 20 is recognised by the portable apparatus 80 (since the identification data of this identification device were already present in memory 10, and in particular in the first register 11), then the operator is allowed to input said monitoring data MD.

[0050] In this manner the operator, before being in a position to input the monitoring data MD, i.e. those data on which the reports describing the state of the safety

structures will be then based, is forced to go close to the structures themselves, i.e. to a distance therefrom equal to or smaller than the reading distance of the reading device 20.

[0051] To enable the operator to input the monitoring data MD, the portable apparatus 80 is preferably equipped with a user interface 70 constituting said data input means 71.

[0052] The user interface 70 may comprise display means, such as a conventional monitor or display, and data input means, such as a conventional keyboard, for example.

[0053] Advantageously, the user interface 70 can consist of a touch screen, for example.

[0054] The user interface 70 is preferably operated in a first and at least one second operating condition. In the first operating condition, the user interface 70 only allows data to be displayed, descriptive data concerning structures 30, 40, 50 previously stored in memory 10, for example. In the second operating condition, the user interface 70, in addition or as an alternative to said displaying, enables the operator to input monitoring data MD.

[0055] In the second operating condition, the user interface 70 preferably shows a suitable mask to the operator, inside which the operator can fill in fields relating to execution of an inspection or control, and to the results of this inspection or control. The monitoring data MD are the data that are inputted in these fields.

[0056] Preferably, in the first operating condition the user interface allows display of the mask relating to entry of the monitoring data MD, but does not allow these data to be inputted; in the second operating condition, on the contrary, data entry is also enabled. From the graphic point of view, the mask colour is conveniently varied from the first to the second operating conditions.

[0057] Generally, the monitoring data MD are data relating to controls and inspections carried out by the operator on structure 30, 40, 50 associated with the identification device 30a, 40a, 50a that has been recognised.

[0058] Preferably, the monitoring data MD comprise one or more of the following parameters:

- type of inspection/verification: for instance, it can consist of a visual inspection, a visual in-depth inspection; an overhauling/servicing operation, a testing operation;
- type of control: each inspection/verification is made up of one or more controls; the controls are carried out based on specific structure features that are to be monitored in time.

[0059] Therefore, the user interface 70 preferably has one or more masks, in which the monitoring data MD can be inputted following a predetermined hierarchical line; a first level of this hierarchical line consists of verifications, and a second level consists of the controls carried out for each verification.

[0060] In order to draw the operator's attention to the fact that the second operating condition is active, the colour of the screen background, or at least of some fields thereof, can be for instance modified.

[0061] The user interface 70 is operatively interlocked with the processing unit 60, so that the second operating condition of the user interface 70 is activated when the processing unit 60 ascertains that there is a match between the stored data SD and the detection data DD.

[0062] In particular, following this matching, the processing unit 60 generates a suitable activation signal AS, directed to the user interface 70 for driving the latter to the second operating condition.

[0063] Advantageously, the aforesaid memory 10 is further provided with a second register 12, in which the monitoring data MD are stored.

[0064] Therefore, memory 10 can be imagined like a table having at least two columns defining the first register 11 and second register 12, respectively; in a given raw, in the first column (i.e. in the first register 11) there will be the identification code of a given structure and in the second column (i.e. in the second register 12) there will be the monitoring data inputted with reference to such a structure.

[0065] Fig. 2 diagrammatically shows a combination of components through which the contents of memory 10 of the portable apparatus 80 can be set.

[0066] In this configuration system 1 comprises a main computer 100; the main computer 100 can consist of a conventional PC for instance, which is suitably configured for performing the functions hereinafter described.

[0067] The main computer 100 is provided with a first communication module 110, for communicating with a reading device and receiving identification data ID of structures 30, 40, 50, from the respective identification devices 30a, 40a, 50a.

[0068] The first communication module 110 may comprise a wireless module (a Bluetooth® module, for example) or any other communication interface to enable the aforesaid data to be received from said reading device.

[0069] Advantageously, the reading device with which the first communication module 110 can communicate is said reading device 20 associated with the portable apparatus 80.

[0070] Practically, in a learning and setting step of the system, identification codes are read in the identification devices 30a, 40a, 50a, which codes will be then associated with structures 30, 40, 50 for uniquely identifying the latter.

[0071] During this step, the identification devices 30a, 40a, 50a preferably are not yet positioned at the respective structures, but they can be gathered in the vicinity of the main computer 100, so as to facilitate the starting operation concerning data input.

[0072] The main computer 100 further comprises a main storage register 120 for storing the identification data ID received through the first communication module 110.

[0073] The main computer 100 further comprises a

second communication module 130 for communication with the first storage register 11 of memory 10 of the portable apparatus 80. Through the second communication module 130 at least part of the identification data ID stored in the main storage register 120 are transferred into memory 10 of the portable apparatus 80.

[0074] The identification data ID transferred to memory 10 therefore constitute the above mentioned stored data SD, that will then be used for recognising the identification devices 30a, 40a, 50a and the structures 30, 40, 50 associated therewith.

[0075] Advantageously, the main computer 100 can further comprise another communication module (not shown), for connection with a remote server, into which all data concerning planning and execution of control activities connected with safety are stored.

[0076] In the preferred embodiment, the main computer 100 is further provided with a planning module (not shown) enabling a user to schedule the different control and monitoring activities that are to be performed, through a suitable graphic interface for example.

[0077] It should be noted that also only part of the identification data ID contained in the main storage register 120 can be transferred to the first register 11 of memory 10 of the portable apparatus 80; in particular, it is advantageously possible to transfer the identification codes ID singling out only and all the structures that an operator has stated will the subject matter of the control activity. The decision on which structures are to be controlled can be taken with the backing of said planning module the function of which will be to supply the operator in charge with all information on scheduling of the inspections, the due dates, and the optimal or preferred path in the spaces in which the structures being the object of said inspection are located.

[0078] Alternatively, the aforesaid setting step is directly performed by the portable apparatus 80, through the reading device 20, without the aid of the main computer 100; reading of the identification codes ID and the related storage in the first storage register 11 can exactly be performed directly by the portable apparatus 80, before the operator in charge starts the control and inspection procedures.

[0079] In this context, the identification devices 30a, 40a, 50a can be already positioned with the respective structures 30, 40, 50 also before the initial system setting step is carried out.

[0080] In the light of the above described structure, as regards the system operation the following is to be pointed out.

[0081] First of all, an initial setting step is performed in which, by means of the reading device 20, the contents of the identification devices 30a, 40a, 50 are read. These contents are identification data ID of structures 30, 40, 50 that are to be monitored.

[0082] The identification data ID, preferably by means of the main computer 100, are transferred to the first register 11 of memory 10 of the portable apparatus 80.

[0083] Preferably, each identification device 30a, 40a, 50a, after reading, is positioned in the vicinity of the respective structure 30, 40, 50. At this point, the control activity can start being performed by the operator entrusted with this task; the operator is provided with the reading device 20 and the portable apparatus 80. The operator moves at the inside of the environment where structures 30, 40, 50 are, going close to each of them in succession. For instance, when he/she is close to structure 30 (an extinguisher, for example), he/she moves the reading device 20 close to the identification device 30a that is positioned in the vicinity of structure 30, so that the reading device 20 can supply the portable apparatus 80 with the detected datum DD read by said identification device 30a.

[0084] The processing unit 60 compares the detected datum DD with the different stored data SD and, if everything has occurred in a correct manner, verifies whether the detected datum DD is the same as one of the stored data SD. Then the processing unit 60 generates the activation signal AS, so as to drive the user interface 80 to the second operating condition.

[0085] After performing the required control/inspection procedures, the operator can therefore input the monitoring data MD, representative of said procedures and of the pertinent results.

[0086] When the control activity has been completed, the portable apparatus 80 can be connected again to the main computer 100, so that the collected data can be downloaded into the main storage register 120 and possibly transmitted to the aforesaid remote server.

[0087] In this way it is also possible to update the planning program concerning inspections, eliminating the due dates already dealt with, and setting new due dates.

[0088] As mentioned above, within the scope of the present invention also other alternative embodiments are provided.

[0089] In a first alternative embodiment (Fig. 3), the reading device 20 is suitably associated with a portable apparatus 80; preferably, the reading device 20 is integrated into this portable apparatus 80.

[0090] The portable apparatus 80 enables the operator, through data input means 71, to input the monitoring data MD relating to structures 30, 40, 50, which structures are identified through reading of the respective identification devices 30a, 40a, 50a.

[0091] This data input means 71 can even comprise only two buttons or equivalent means, for example; one button for inputting a datum of the type "in compliance" (i.e., following the control carried out, the operator has judged that the structure in question has no problems, i.e. is in compliance with the regulations in force), and one button for inputting a datum of the type "not in compliance" (i.e. following the control carried out, the operator has judged that the structure in question does not comply with one or more of the safety criteria).

[0092] The monitoring data MD thus inputted can be stored in suitable storage means 10 integrated into the

portable apparatus 80.

[0093] In particular, apparatus 80 can be provided with a memory 10, in which the identification codes detected by the reading device 20 are stored, said codes being suitably combined with the respective monitoring data MD inputted by the operator.

[0094] When inspection has been completed, the portable apparatus 80 can be connected to a main computer 100, into which the data stored in the memory of apparatus 80 are downloaded. Advantageously, the data stored in the memory of apparatus 80 are transferred to memory 120 of the main computer 100 so that the latter can keep a trace of the origin or source of these data; for instance, the monitoring data MD and the respective identification codes of the structures can be associated with an identifier of the operator who has performed said inspections.

[0095] The main computer 100 will be preferably able to carry out controls on the received data, checking, for instance, whether the examined structures actually pertained to that operator, whether the latter did not omit any of the structures that he/she should have taken into consideration, etc.

[0096] In particular, the main computer 100 can be provided with one or more storage registers in which the identification codes of the structures that are to be the object of an inspection and/or control are listed, said codes being suitably divided (through association with identifiers representative of the different operators, for example), depending on the operator who is designed to be responsible for said structures.

[0097] Alternatively, the portable apparatus 80 can comprise a wireless transmission module 81 enabling a transmission substantially in real time of the detected data by means of the reading device 20, and of an identifier representative of the operator.

[0098] The main computer 100 will then be provided with a wireless reception module 101, operation of which will be exactly the same as described above; controls will be carried out on data received by means of this wireless reception module 101.

[0099] Wireless transmission of the monitoring data MD and the identification codes of the respective structures can be provided in place of, or also in combination with storage of this information in the memory 10 of the portable apparatus 80.

[0100] As a function of the monitoring data MD received, the main computer 100 will be also able to update its database concerning due dates and scheduling of inspections.

[0101] In a further embodiment of the invention (Fig. 4), the monitoring data MD, inputted through the data input means 71, can be stored in memories 30b, 40b, 50b integrated into the identification devices 30a, 40a, 50a.

[0102] The portable apparatus 80 can then be provided with a writing device 21, such as a device adapted to write data on the memory being part of a RFID tag, for example.

[0103] The monitoring data MD in this case can comprise the inspection date and/or the result of said inspection, for example. In this way, the step of transferring the monitoring data MD to the main computer (through wireless transmission or by storage into the memory of the portable apparatus 80 and subsequent download to the main computer) can also be avoided.

[0104] On occurrence of the subsequent control, through the reading device 20, the operator will be able to detect not only the identification codes associated with structures 30, 40, 50, but also the respective monitoring data inputted during the preceding control.

[0105] The invention achieves important advantages.

[0106] First of all, the system according to the invention enables more efficiency and reliability to be obtained in the safety controls carried out.

[0107] In addition, the system of the invention allows the inspection/verification operations of the structures present in a given environment to be simplified and automated.

Claims

1. A system for monitoring structures, comprising:

- a short-range reading device (20) adapted to read from identification devices (30a, 40a, 50a) associated with structures (30, 40, 50), detection data (DD) identifying at least one of said structures (30, 40, 50);
- data input means (71) to enable an operator to input monitoring data (MD) relating to said at least one structure (30, 40, 50) into said system;
- storage means (12; 30b, 40b, 50b, 120) operatively associated with said data input means (71) for storing said monitoring data (MD).

2. A system as claimed in claim 1, further comprising:

- a portable apparatus (80) associated with said reading device (20) and provided with:

  · a memory (10) including at least one first register (11) containing stored data (SD) identifying said structures (30, 40, 50);
  . a processing unit (60) operatively associated with said memory (10) and said reading device (20) for comparing said stored data (SD) with said detection data (DD);
  · a user interface (70) defining said data input means (71) and operatively interlocked with said processing unit (60) to enable an operator to input said monitoring data (MD) relating to said at least one structure (30, 40, 50) in case of matching between said stored data (SD) and detection data (DD).

3. A system as claimed in claim 1 or 2, wherein said reading device (20) is an RFID tag reader.

4. A system as claimed in anyone of the preceding claims, wherein each identification device (30a, 40a, 50a) comprises an RFID tag, each of them being associated with a respective structure (30, 40, 50).

5. A system as claimed in anyone of the preceding claims, wherein said monitoring data (MD) are representative of a monitoring or inspection operation carried out by said operator on said at least one structure (30, 40, 50).

6. A system as claimed in claim 5, wherein said user interface (70) can be driven between a first operating condition, at which input of said monitoring data (MD) is not allowed, and a second operating condition, at which input of said monitoring data (MD) is allowed.

7. A system as claimed in claim 6, wherein said processing unit (60) is configured in such a manner that in case of matching between said stored data (SD) and detection data (DD), an activation signal (AS) is generated for driving said user interface (70) to the second operating condition.

8. A system as claimed in claim 2, wherein said storage means comprises a second register (12) being part of said memory (10), for storing said monitoring data (MD) of said at least one structure (30, 40, 50), said data being associated with the stored data (SD) identifying said at least one structure (30, 40, 50).

9. A system as claimed in anyone of the preceding claims, further comprising a main computer (100), provided with:

- a first communication module (110) for communicating with a reading device and receiving identification data (ID) for said structures (30, 40, 50) from said identification devices (30a, 40a, 50a);
- a main storage register (120), in which said identification data (D) of said structures (30, 40,50) received from said first communication module (110) are stored;
- a second communication module (130) for communicating with the first register (11) of said memory (10) in order to carry out transfer thereinto of at least part of the identification data (ID) stored in said main storage register (120),

the identification data (ID) transferred from the main storage register (120) to the first register (11) of said memory (10) defining the stored data (SD) stored in the first register (11) of the memory (10).

10. A system as claimed in claim 9, wherein the reading device that the first communication module (110) is adapted to communicate with, is the reading device (20).

11. A system as claimed in claim 1, wherein said storage means comprises memories integrated into said identification devices (30a, 40a, 50a).

12. A system as claimed in claim 1, wherein said storage means comprises at least one memory integrated into a portable apparatus (80) operatively associated with said reading device (20).

13. A system as claimed in claim 1 or 12, further comprising a portable apparatus (80) provided at least with one transmission module (81) for sending said monitoring data (MD) to a main computer (100).

14. A system as claimed in claim 13, wherein said transmission module (81) is configured for sending said monitoring data (MD) and said detection data (DD) identifying the structure/s to which said monitoring data (MD) are referred, to said main computer (100).

15. A system as claimed in anyone of claims 12 to 14, wherein said reading device (20) is integrated into said portable apparatus (80).

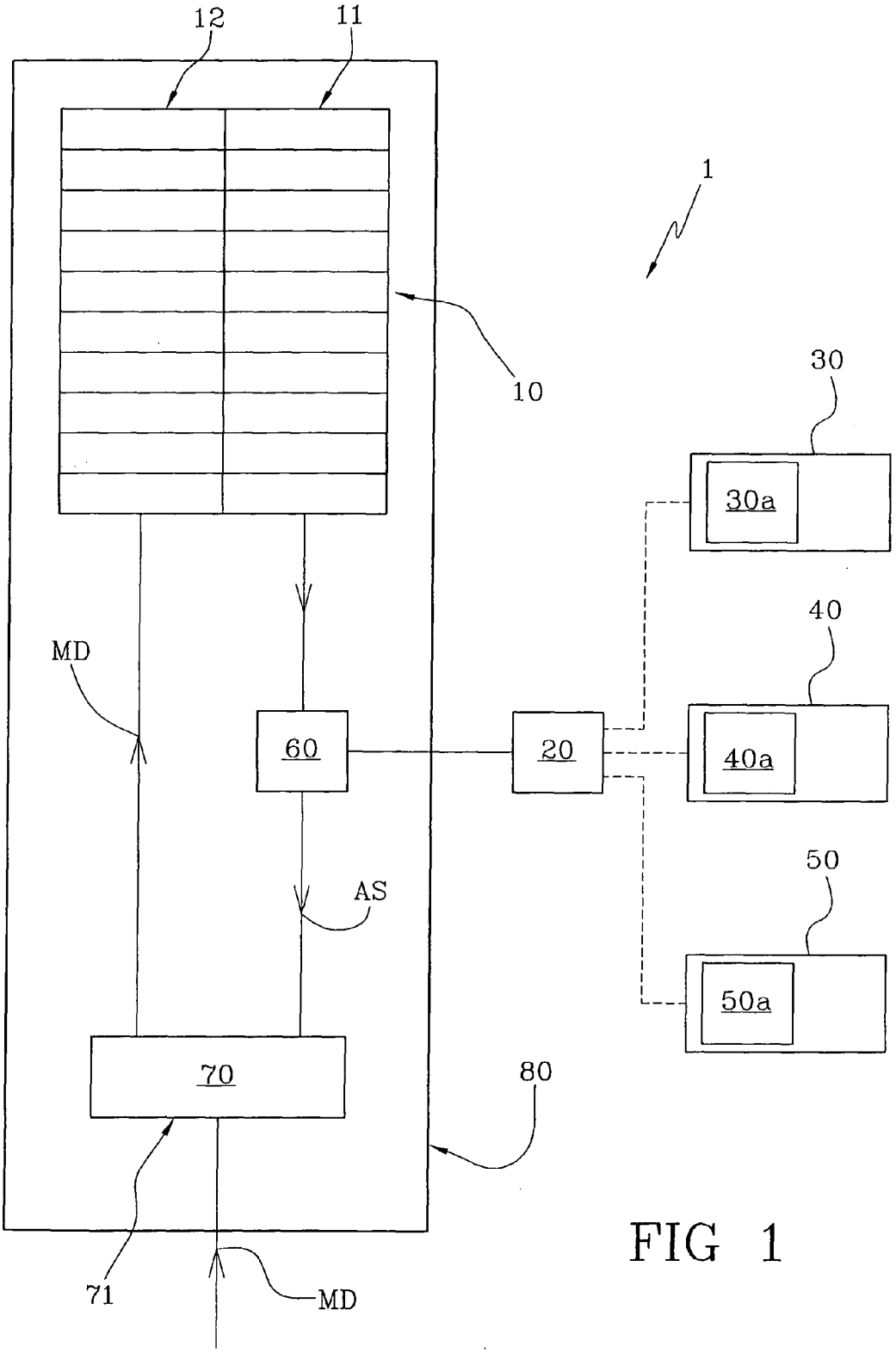


FIG 1

FIG 2

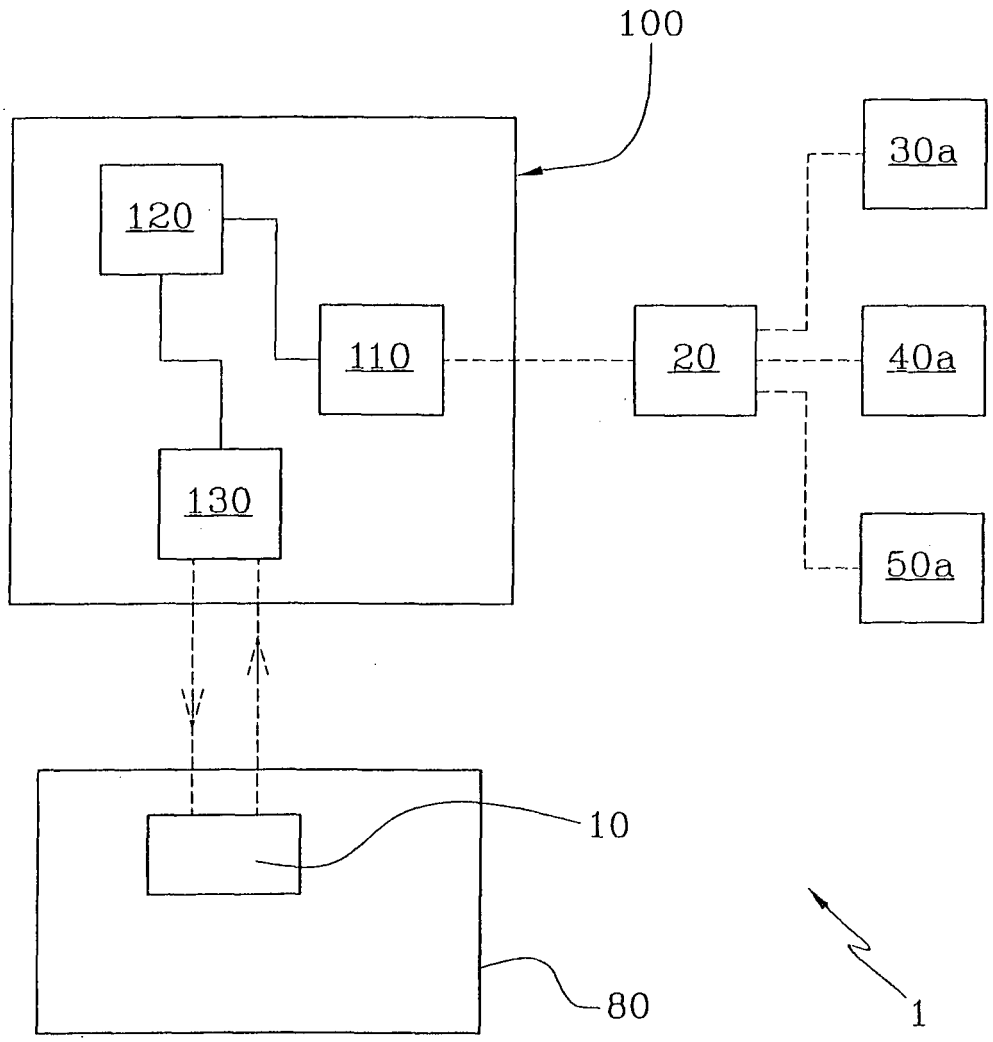


FIG 3

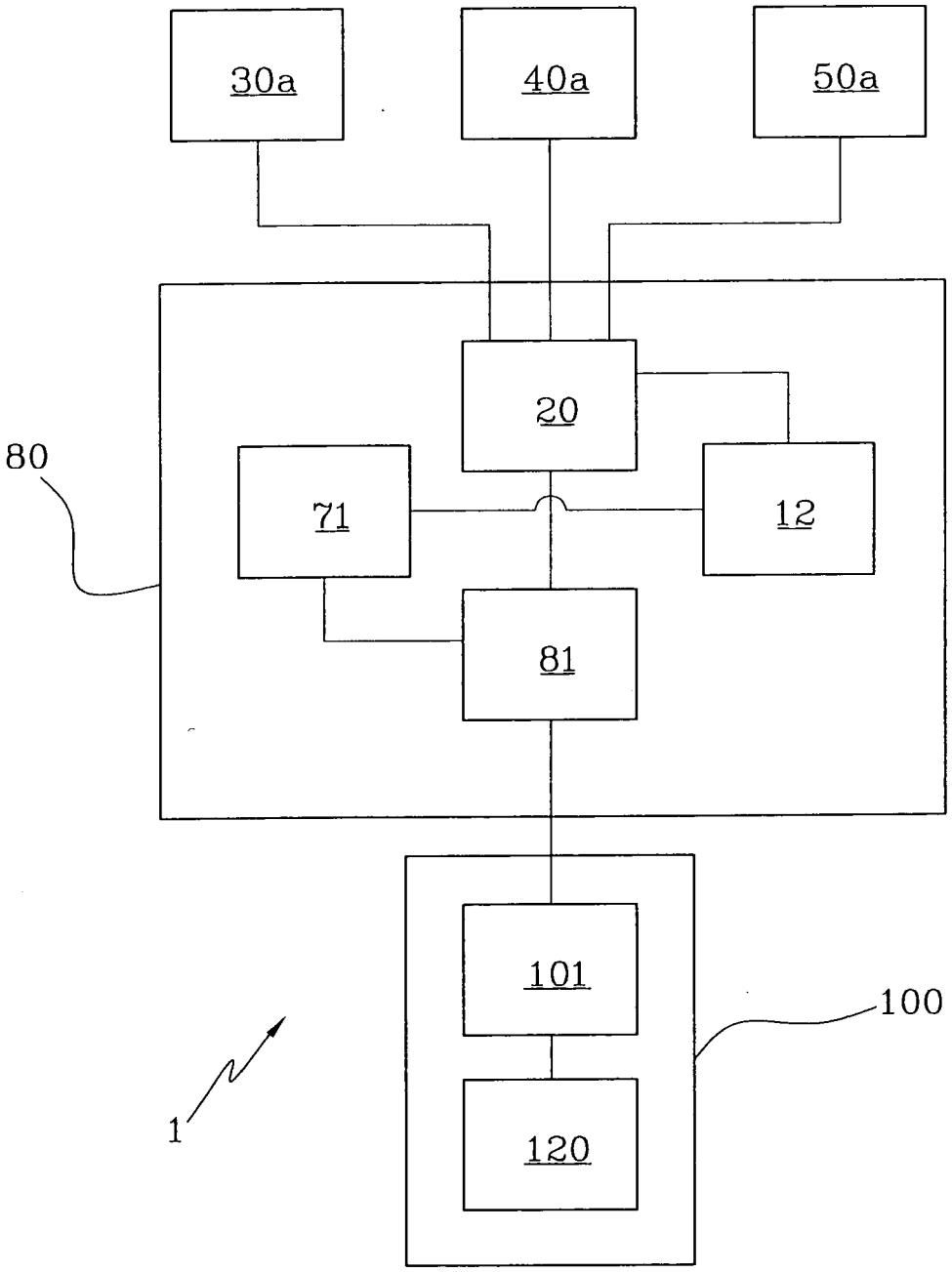
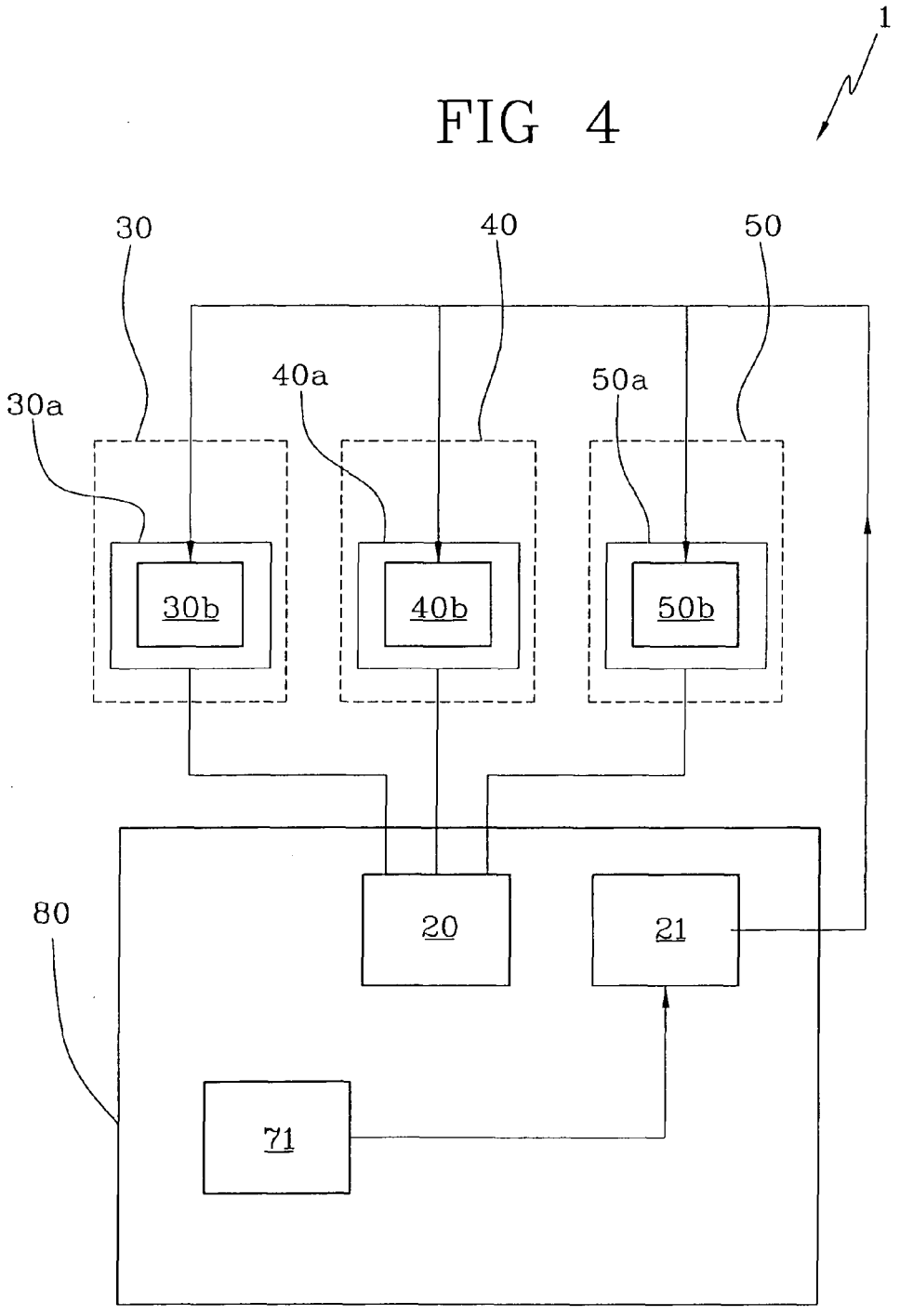


FIG 4



Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 09 42 5154

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2003/061005 A1 (MANEGOLD ERIC S [US] ET AL) 27 March 2003 (2003-03-27) * paragraph [0009] - paragraph [0010] * * paragraph [0013] - paragraph [0014] * * paragraph [0037] - paragraph [0062] * * paragraph [0073] - paragraph [0074] * * figures 1-6,12 *	1-5,8-15	INV. G07C3/14
X	US 2005/023347 A1 (WETZEL ROBERT ALAN [US] ET AL) 3 February 2005 (2005-02-03) * paragraph [0003] * * paragraph [0007] - paragraph [0015] * * paragraph [0021] - paragraph [0024] * * figures *	1,6,7	
A	WO 2008/130777 A (GEN ELECTRIC [US]; LOGAN PRESCOTT [US]; DAVENPORT DAVID [US]; HERSHEY) 30 October 2008 (2008-10-30) * page 7, line 1 - page 11, line 15 * * figure 1 *	1	
			TECHNICAL FIELDS SEARCHED (IPC) G07C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	15 September 2009	Paraf, Edouard

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 09 42 5154

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

15-09-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003061005 A1	27-03-2003	AU 2002322510 B2	25-05-2006
		CA 2458050 A1	20-03-2003
		EP 1573427 A2	14-09-2005
		JP 2005512169 T	28-04-2005
		WO 03023550 A2	20-03-2003
		US 2008316007 A1	25-12-2008
		US 2003050764 A1	13-03-2003
US 2005023347 A1	03-02-2005	US 2005211777 A1	29-09-2005
		US 2009082039 A1	26-03-2009
WO 2008130777 A	30-10-2008	US 2007194115 A1	23-08-2007

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82