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(54) Method and system for managing an interlocking

(57) The present invention proposes a method and a system for managing an interlocking (11), the system comprising:
- a onboard control system (21) configured for being used on board a guided vehicle (3) and capable of remotely monitoring, controlling, locking and/or releasing a track device of said interlocking (11) by exchanging interlocking data with a wayside local device (22);
- said wayside local device (22) configured for being mounted at an interlocking area (1) comprising at least said interlocking (11), serving as interface between the onboard control system (21) and the track device of said interlocking (11), capable of communicating with the onboard control system (21) for exchanging said interlocking data, and capable of controlling and commanding the track device according to the interlocking data exchanged with the onboard control system (21).

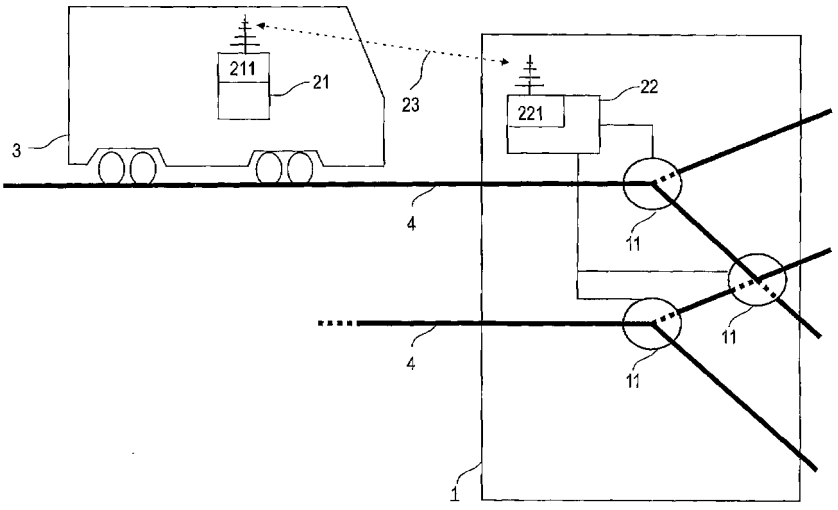

FIG 1

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Description

[0001] The present invention concerns a method and a system for managing an interlocking according to claims 1 and 10.

[0002] In particular, the present invention relates more generally to the management of train routes at interlocking areas and preventing conflicting train movements.

[0003] An interlocking is conventionally an arrangement of switch, lock and signal devices, i.e. a group of track devices, that is located where rail tracks cross, join, separate, and so on. Said devices are interconnected in such a way that their movements succeed each other in a predefined order, thereby preventing opposing or conflicting train movements and establishing a specific route for each train having to pass said interlocking. Said track devices are usually controlled by wayside interlocking control systems which are responsible for handling and managing the devices of the interlocking according to an interlocking logic and train movements while assuming train safety. Thus, the interlocking logic is at the basis of the management of the state of the interlocking, and thus of its devices.

[0004] Even if wayside interlocking control systems are vital devices which are relevant where basic management of interlocking is needed, they represent unnecessary additional or redundant costs and systems where trains can be fitted with an Automatic Train Control (ATC) system. The co-existence of ATC and interlocking control systems results in addition in a complex system architecture due to the need of high level of interfaces between the logic of the interlocking and the logic of the ATC system.

[0005] Consequently, there is a standing need for developing a flexible, cost effective and efficient interlocking control system which facilitates the merging of train and interlocking control concepts.

[0006] It is therefore an objective of the present invention to provide a method and a system for managing an interlocking in an efficient, flexible, cost effective way, having a simple architecture, and which avoid the above-mentioned problems.

[0007] This objective is achieved according to the present invention with respect to the system by a system for managing an interlocking configured for establishing a route for a guided vehicle at an interlocking area comprising at least said interlocking, said system comprising:

- an onboard control system configured for being used on board a guided vehicle and capable of remotely monitoring, controlling, locking and/or releasing a track device of an interlocking at the interlocking area by exchanging interlocking data with a wayside local device in particular through wireless communication by means of a communication system of the on-board control system;
- said wayside local device configured for being mounted at the interlocking area, serving as interface between the onboard control system and the track device, notably capable of communicating with the on-board control system for exchanging said interlocking data, and in particular capable at the same time of communicating with at least another onboard control system for exchanging other interlocking data, wherein said communication is in particular realized according to the wireless communication with the communication system of each onboard control system, and capable of controlling and commanding the track device according to the interlocking data exchanged with the onboard control system.

[0008] The objective is also achieved according to the present invention with respect to the method by a method for managing an interlocking at an interlocking area, the method comprising the steps of:

- an on board determination of interlocking data in function of a route of a guided vehicle crossing said interlocking by means of an onboard control system usable on board said guided vehicle, wherein said interlocking data determined by the onboard control system are designed for configuring and locking a track device of the interlocking according to said route;
- a remote communication of said interlocking data by the onboard control system to a wayside local device configured for being mounted at the interlocking area and capable of establishing said route by controlling and commanding each track device of the interlocking;
- a control and command of each track device of the interlocking by the wayside local device for locking/releasing the interlocking according to said interlocking data.

[0009] The expression "guided vehicle" refers to a vehicle configured for following a guide or a succession of guides which determine at least one route for the guided vehicle. Said guide being for example a rail, or a line on the ground, etc., and said guided vehicle being for example a train, a metro, or an automatic guided vehicle.

[0010] In particular the onboard control system is a portable on-board control system, wherein the wording "portable" refers in particular to a device designed for being carried by a driver of the guided vehicle. In other words, the portable onboard control system is in particular light and compact for enabling an easy transport by guided vehicle's drivers, so that the portable onboard control system can easily be brought by said driver on board the guided vehicle depending on the type of vehicle and typical operational usage. In particular, said portable onboard control system might be temporary or permanently mounted in an adequate place in said guided vehicle, said portable onboard control system comprising for this purpose means for quickly fixing or releasing its body to a portable onboard control system support and

being thus advantageously quickly mountable in or dismountable from the guided vehicle.

[0011] Preferentially, for one interlocking area through which passes routes of several guided vehicles each carrying an on-board control system, the wayside local device is capable of exchanging in parallel respective interlocking data with several respective onboard control systems and/or with a central work station, while controlling and commanding each track device according to the interlocking data received from one and only one of said respective onboard control systems and/or central work station at a time, avoiding thus a simultaneous handling of a track device by several systems, i.e. several onboard control systems or, one or several onboard control systems and the central work station. In other words and preferentially, the method according to the invention might comprise the following steps:

- another on-board determination of interlocking data in function of a route of another guided vehicle crossing said interlocking by means of another on-board control system;
- a remote communication from said another onboard control system to said local wayside device of said interlocking data determined by the other onboard control system;
- a parallel handling by the wayside local device of each interlocking data received from said onboard control system and said other onboard control system; and
- said control and command of each track device by the wayside local device for locking/releasing the interlocking according to the interlocking data from one and only one among said onboard control system and said other onboard control system at a time.

[0012] In particular, the wayside local device is capable of controlling and commanding track devices of several interlockings at said interlocking area. Therefore, one single wayside local device may in particular handle in parallel several track devices at an interlocking area and thus several of said interlocking data, i.e. several Inputs/Outputs, sent by different onboard control systems and/or a central work station, and is able to command and control in parallel and according to said interlocking data exchange, the track devices of several interlockings belonging to the interlocking area.

[0013] Preferentially, the wayside local device is characterized by at least two states of working for each track device it is able to control and command, respectively an "available" state and a "busy" state, wherein the change from the available state to the busy state results in particular from the reception of said interlocking data of an onboard control system, and the change from the busy state to the available state results from the reception of a clear route message (hereafter C-message) sent by the onboard control system. In particular, the busy/available state is defined per track device at the interlocking area. In other words, one wayside local device is in particular capable of commanding/controlling at least one track device of each interlocking belonging to the same interlocking area as the wayside local device, and might be characterized for each track device of said interlocking belonging to said same interlocking area by said busy/available state, wherein each track device might be remotely controlled, locked and/or released by one onboard control system at a time, but might be in particular monitored by several onboard control systems simultaneously, notably according to a setting message sent by the wayside local device to one or several onboard control systems. According to the invention and preferentially, the track devices of interlockings belonging to an interlocking area cannot be simultaneously handled by more than one onboard control system, and might be handled by a single wayside local device which is able to treat each track device individually.

[0014] In its available state for a track device, the wayside local device is ready for locking said track device according to a route defined by the onboard control system at the interlocking: it is able to control and command each track device of the interlocking according to the interlocking data and to return to the onboard control system which sent said interlocking data and for each track device of the interlocking a message, called hereafter A-message, designed for confirming the availability of the track device, and which therefore is able to confirm the availability of the interlocking if each track device of the interlocking is available. In its busy state, the wayside local device do not treat any other incoming interlocking data designed for configuring a track device of said interlocking, but returns to the onboard control system which sent said other interlocking data a message stating the non-availability of the track device, in particular of each track device of the interlocking, and therefore stating the non-availability of the interlocking, said message being called hereafter B-message. Thus, the method according to the invention comprises in particular returning to the onboard control system which sent interlocking data a A-message confirming the availability of a track device of the interlocking when said track device is ready for being commanded and controlled according to the interlocking data sent by said onboard control system, and returning a B-message stating the non-availability of the track device when said track device of the interlocking, or at least one track device of said interlocking, cannot be commanded and controlled according to the interlocking data sent by the onboard control system.

[0015] Moreover, for each track device handled by the same wayside local device, said wayside local device can preferentially return an A-message to only one onboard control system at a time, while returning a B-message for each other onboard control system trying to send him interlocking data for the track device.

[0016] In particular, the wayside local device is preferentially able to receive interlocking data from onboard control systems of different guided vehicles, but solely

the interlocking data of a single onboard control system will be transmitted to a track device of an interlocking at a time. In particular, the wayside local device is able to work according to the principle "first-come, first-served", i.e. each time a wayside local device is in an available state for a track device, the first interlocking data received by said wayside local device from an onboard control system for a track device of the interlocking will put the wayside local device in the busy state for said track device for each other onboard control system which wants to send its interlocking data to the wayside local device for said track device.

[0017] The wayside local device is thus preferentially capable of receiving said interlocking data from the onboard control system of one or several guided vehicles wherein said interlocking data are designed for one or several track devices handled by the wayside local device, but for each track device, the wayside local device will return a A-message for only one onboard control system at a time, which is the first onboard control system, i.e. temporally the first onboard control system, having sent its interlocking data to the wayside local device for the track device of the interlocking when the wayside local device was characterized by the available state for said track device. Advantageously, the method of interlocking management according to the invention avoids a simultaneous control of a track device, and therefore an interlocking, by several onboard control systems.

[0018] Preferentially, the interlocking data comprise at least a first set of interlocking data when they are determined by the onboard control system and sent to the wayside local device, and at least a second set of interlocking data when they are determined by the wayside local device and sent to the onboard control system.

[0019] In particular, the first set of interlocking data may comprise at least one of the following items:

- a request for controlling a track device of an interlocking;
- a locking message for locking said track device, said locking message being preferentially designed for configuring and locking the track device of the interlocking according to a setting determined by the onboard control system in function of a route followed by the guided vehicle carrying the onboard control system;
- a C-message, i.e. clear route message configured for confirming that the whole guided vehicle passed the track device, and in particular that said track device may be released.

[0020] Preferentially, the request for controlling is a request for controlling each track device of an interlocking, the locking message is preferentially designed for locking and configuring each track device of the interlocking according to said setting, and the C-message is able to confirm that the guided vehicle passed the interlocking and that the track devices of said interlocking might be released.

[0021] Preferentially, the second set of interlocking data that might be determined by the wayside local device for each track device of an interlocking area and sent by said wayside local device to one or several onboard control systems may comprise at least one of the following items:

- a setting message configured for describing an actual setting of the track device, said setting message comprising in particular an actual setting of the track device. For example, said actual setting might be an information about the light of the track device that might be green or red, or a state of a switch that might be open or close, or a working state of a track device that might be out of order or working. Said setting message might in particular be sent by the wayside local device to any onboard control system requesting said setting message which gives information about the configuration of each track device of an interlocking;
- an A-message;
- a B-message;
- a security message designed for activating a security process, hereafter S-message.

[0022] In particular, when a guided vehicle comprising said onboard control system approaches an interlocking area, said onboard control system may send to the wayside local device either interlocking data comprising only said request for controlling at least one track device of said interlocking, or interlocking data comprising said request for controlling and said locking message for controlling and locking at least one track device of the interlocking, wherein said locking message comprises in particular data for setting or configuring the track device according to a route of the guided vehicle. In both cases, the reply from the wayside local device to a request for controlling comprised in the interlocking data sent by the onboard control system is either an A-message or a B-message. If the onboard control system receives an A-message, then it may in particular send said locking message for configuring the track device if said locking message was not already accompanying the request for controlling. Preferentially, during the period of time the wayside local device locks a track device of an interlocking for one guided vehicle, it sends back to each other incoming request for locking said track device or at least one of the track devices of the interlocking a B-message. Once the onboard control system carried by the guided vehicle for which the track device was locked cleared the track device by sending a C-message, confirming therefore that the whole guided vehicle passed the track device, the wayside local device releases said track device, returns to its available state for said track device and becomes ready for receiving a new request for locking said track device.

[0023] Preferentially, the locking message comprises

said setting designed for configuring and locking the track device, or in particular several settings, wherein each setting is designed for configuring one of the track devices of an interlocking, the number of settings equaling in this case the number of track devices of the interlocking. In particular, the onboard control system comprises a treatment unit capable of determining said setting in function of route data configured for defining the route followed by the guided vehicle and according to an interlocking logic. Preferentially, the onboard control system comprises said communication system capable of remotely communicating said interlocking data to the wayside local device. Accordingly, the wayside local device comprises also a communication system for receiving the interlocking data from onboard control systems of different guided vehicles and sending back interlocking data to each of said on-board control systems, wherein solely the data of a single onboard control system will command/control the track devices of an interlocking at a time.

[0024] Preferentially, the onboard control system managing the route for a guided vehicle is capable of communicating with another onboard control system configured for being carried by another guided vehicle, or with a central work station for coordinating a prioritization of guided vehicles having a route crossing a same track device or a same interlocking, called hereafter incoming guided vehicles. According to a first preferred embodiment, the central work station determines the successive order of guided vehicles crossing a same track device or interlocking. According to another preferred embodiment, the onboard control system comprises in particular an analyzer capable of establishing and recording a dynamic prioritization list of the incoming guided vehicles, wherein said list comprises a successive order in which the incoming guided vehicles have to pass the track device or the interlocking (i.e. a group of track devices forming said interlocking), the first guided vehicle of said list being a first priority guided vehicle, and the second guided vehicle of said list becoming the first priority guided vehicle as soon as a C-message is received by the wayside local device through its communication system for each track device of the interlocking, said C-message being preferentially either sent to the onboard control system of all incoming guided vehicles by the onboard control system which originally sent said C-message, or transferred by the wayside local device to all incoming guided vehicles.

[0025] Preferentially, the onboard control system comprises a database configured for recording and comprising specifications of the guided vehicle network and/or at least specifications of said route followed by the guided vehicle, i.e. said route data. Preferentially, said onboard control system might be connectable, by means of at least one connector, to a guided vehicle onboard control system for acquiring said specifications and/or characteristics of the guided vehicle such as real time speed, type of guided vehicle, time schedule, delay, prioritization value. In particular, said onboard control system comprises a manual working mode which authorizes a driver to manually input manual data that might be notably used by the treatment unit, for example in case of degraded operation or failure mode in which, some data would not be readily available to the onboard control system.

[0026] Preferentially, said specifications comprise at least characteristics (type, function, track devices equipping said interlocking and their characteristics, ...) of each interlocking belonging to the guided vehicle route or belonging to said network, as well as their position in the network or on the route, so that from said specifications, the onboard control system might be able to determine said interlocking data and therefore said setting for at least each track device of the interlockings belonging to said guided vehicle route. Thus, the onboard control system is able to collect information related to:

- the route and/or network, in particular said route data,
- each interlocking belonging to said route,
- the guided vehicle,

from an on-board database, and/or an on-board or remote guided vehicle control system, and to receive messages, at least said A-message, B-message, setting and security messages, from the communication system of the wayside local device.

[0027] Preferentially, the onboard control system managing the interlocking for a guided vehicle that is carrying said onboard control system is able to send the interlocking data to a wayside local device capable of handling a track device of an interlocking crossed by the guided vehicle route when the distance between said guided vehicle and the interlocking area comprising said interlocking becomes smaller than a predetermined value. For example, said value might be determined in function of the guided vehicle type, speed and braking characteristics.

[0028] Preferentially, the treatment unit is able to determine said setting, which is designed for locking said track device in a configuration that allows solely and safely said route of the guided vehicle through the track device. The setting is preferentially determined from at least said characteristics of the track device of the interlocking and according to the route followed by the guided vehicle. Then, the onboard control system is in particular able to directly configure each track device of the interlocking belonging to the guided vehicle route in function of said setting by sending the interlocking data to the wayside local device when the latter is in an available state for said track device. As result, the interlocking might be locked for the guided vehicle route according to said settings as soon as each track device of the interlocking is locked. Preferentially, once each track device of an interlocking is locked, the onboard control system may send a message to the control system of the guided vehicle stating that said interlocking is available for the guid-

ed vehicle.

[0029] The interlocking data are preferentially sent by the communication system of the onboard control system to the communication system of the wayside local device only when a distance between the guided vehicle and the interlocking area is smaller than said predetermined value. In particular, if the communication system of a wayside local device does not receive said interlocking data from an incoming guided vehicle while the distance between said incoming guided vehicle and the interlocking area decreases and becomes smaller than a security distance, wherein said security distance is for example calculated beforehand in function of the distance needed by said guided vehicle to stop before reaching said interlocking area or a fixed distance that separates the interlocking area from an incoming guided vehicle, then the wayside local device is able to communicate to the onboard control system said S-message.

[0030] Preferentially, a connection of the onboard control system with the guided vehicle control system might advantageously provide a basis for exchanging data related to the guided vehicle such as its speed, type, delay, but also to transfer or transmit data from the onboard control system to the guided vehicle control system notably for guaranteeing and ensuring the safety of the guided vehicle, said transmitted data being e.g. said S-message.

[0031] The invention will now be described in preferred but not exclusive embodiments with reference to the accompanying drawings, wherein:

Figure 1 is a schematic illustration of one preferred embodiment of the system according to the invention;

Figure 2 is a schematic illustration of a preferred working principle of the present invention.

[0032] Figure 1 shows a schematic illustration of a preferred embodiment of a system according to the invention for managing at least one interlocking 11 at an interlocking area 1, wherein for example tracks 4 cross, join, separate, or end, the system comprising:

- an onboard control system 21 configured for being used on board a guided vehicle 3 configured for moving on said tracks 4, the onboard control system 21 being capable of remotely monitoring, controlling, locking and/or releasing a track device of an interlocking 11 by exchanging interlocking data with a wayside local device 22 in particular through wireless communication 23 by means of a communication system 211 of the onboard control system 21;
- said wayside local device 22 configured for being mounted at the interlocking area 1, serving as interface between the onboard control system 21 and each track device of the interlocking area 1, notably capable of communicating with the onboard control system 21 by means of a communication system 221 for exchanging said interlocking data, and capable of controlling and commanding the track device of at least one of interlocking 11 according to the interlocking data exchanged with the onboard control system 21.

[0033] Figure 2 presents a schematic illustration of a preferred working principle of the present invention. Figure 1 and Figure 2 have identical reference numbers for identical objects. The preferred working principle of the present invention will be in particular explained in the case of several incoming guided vehicles 3 that may arrive at an interlocking area 1 at a same time or require a locking of the same interlockings 11 of the interlocking area 1 for a same period of time or for overlapping periods of time.

[0034] The wayside local device 22, configured for being mounted at the interlocking area 1, is able to handle each track device of each interlocking 11 of the interlocking area 1. In particular, it can command and control in parallel said interlockings 11 of the interlocking area 1 by controlling and commanding in parallel each track device of the interlocking area 1. Such track devices are for example switch actuators, signals, locks, etc., designed for establishing a route for the guided vehicle 3.

[0035] The onboard control system 21 is in particular a portable on-board control system, wherein each portable onboard control system is configured for being easily carried by a driver into the guided vehicle 3 for driving said guided vehicle 3. For this purpose, the portable onboard control system is in particular a man-portable system, which is compact and sufficiently light for being carried by a person in a manner free of physical constraints. It may notably comprise a battery configured for allowing a working of the portable onboard control system independent from any external power supply, and/or at least one connector intended for a rapid connection of said portable onboard control system to guided vehicle devices, such as an external power supply, a guided vehicle control system, etc.

[0036] Each portable onboard control system might be preferentially temporary fixed on a support in the guided vehicle, wherein said support may comprise complementary connectors to one or several connectors of the portable onboard control system and is configured for quickly releasing/fixing the portable on-board control system into the guided vehicle 3 on said support in a manner free of any additional means for fixing/releasing the portable onboard control system on said support.

[0037] Preferentially, the onboard control system 21 comprises means for storing data (e.g. route data, guided vehicle characteristics, speed, time schedule, interlocking characteristics, guided vehicle network data, etc.). In particular, it comprises also a treatment unit capable of calculating data, said treatment unit being notably able to calculate a setting for each track device of an interlocking 11 according to an interlocking logic and route

data for the guided vehicle. In particular, the means for storing data comprise a database configured for recording specifications of the guided vehicle network and/or at least specifications of the route followed by the guided vehicle equipped with said onboard control system 21. Preferentially, each onboard control system 21 is capable of determining interlocking data, notably by means of said treatment unit and from said means for storing data, wherein said interlocking data may comprise a request for controlling a track device, and/or a locking message configured for configuring and locking said track device according to a setting determined by the onboard control system in function of a guided vehicle route, and/or a clear route message for confirming the safe crossing of track device of the interlocking 11 by the guided vehicle 3.

[0038] When several guided vehicles 3 are approaching the same interlocking area 1, the onboard control system 21 carried by each guided vehicle 3 determines interlocking data designed for securing and establishing the route followed by the guided vehicle 3. Then, each onboard control system 21 communicates its interlocking data to the wayside local device 22, wherein said interlocking data comprises a request for controlling one or several track devices of one or several interlockings of the interlocking area according to the guided vehicle route.

[0039] When receiving said interlocking data from one or several on-board control systems 21 for one or several track devices, said wayside local device 22 returns, for each of said one or several track devices that is ready for being locked, a message confirming the availability of the track device (A-message) to the onboard control system 21 of the first incoming interlocking data (i.e. the interlocking data that temporally arrived the first at the wayside local device for said track device) designed for configuring said track device, and returns to the other onboard control systems 21 for which it has received interlocking data for the same track device after said first incoming interlocking data, a message stating the non-availability (B-message) of the track device.

[0040] Preferentially, if at least one track device of an interlocking 11 is not available for being locked and if the wayside local device 22 received interlocking data requesting a locking of at least one track device of said interlocking 11, then the wayside local device 22 returns to each onboard control system 21 having sent said interlocking data a B-message.

[0041] Preferentially, if several guided vehicles 3 approach the interlocking area 1, the onboard control system 21 of each guided vehicle 3 is able to communicate with the onboard control system 21 of each other guided vehicle and/or with a central work station 5 for determining a prioritization order of the guided vehicles having a route crossing a same interlocking 11 and therefore track device. In particular, the on-board control system comprises an analyzer capable of establishing and recording a dynamic prioritization list of the guided vehicles having a route crossing the same interlocking by exchanging information between said onboard control systems 21, such as a type of guided vehicle, a level of priority, a delay, a time schedule, etc. Preferentially, said list comprises a successive order in which the incoming guided vehicles have to pass the interlocking 11, the first guided vehicle of said list becoming a first priority guided vehicle, and the second guided vehicle of said list becoming the first priority guided vehicle as soon as the onboard control system sent a C-message to the wayside local device and/or to the onboard control system of each other incoming guided vehicle. In particular, once a list has been established by an onboard control system, then said list is distributed by the onboard control systems 21 to each onboard control system 21 of each guided vehicle having the route crossing said same interlocking, and may be updated by taking into account a new incoming guided vehicle.

[0042] To summarize, the method and the system according to the present invention have the following advantages:

- they provide a tool for managing an interlocking from any type of guided vehicle;
- they provide the ability to vitally and dynamically associate one single onboard control system to one wayside local device in such a way that two onboard control systems cannot simultaneously remotely control the same track device;
- they develop an architecture which facilitates the merging of guided vehicle control concept and interlocking control concept;
- they facilitate the use of smart features that are generally available in a guided vehicle control system, such as priority management;
- they improve the efficiency of interlocking management;
- they allow a save of cost, notably by avoiding the use of a wayside/centralized interlocking logic;
- they simplify wayside installation.

Claims

1. System for managing an interlocking (11), said system comprising:

   - a onboard control system (21) configured for being used on board a guided vehicle (3) and capable of remotely monitoring, controlling, locking and/or releasing an track device of said interlocking (11) by exchanging interlocking data with a wayside local device (22);
   - said wayside local device (22) configured for being mounted at an interlocking area (1) comprising at least said interlocking (11), serving as interface between the onboard control system (21) and the track device, capable of communi-

cating with the onboard control system (21) for exchanging said interlocking data, and capable of controlling and commanding the track device according to the interlocking data exchanged with the onboard control system (21).

2. System according to claim 1, wherein the wayside local device (22) is capable of exchanging in parallel respective interlocking data with several respective: onboard control systems (21), while controlling and commanding the track device according to the interlocking data received from one and only one of said respective onboard control systems (21) at a time.

3. System according to one of the claims 1 or 2, wherein the wayside local device (22) is able to command and control in parallel the track devices of several interlockings (11) belonging to the interlocking area.

4. System according to claim 3, wherein the onboard control system (21) and the wayside local device (22) comprise each a communication system (211, 221) for exchanging said interlocking data through wireless communication.

5. System according to one of the claims 1 to 4, wherein the wayside local device (22) is **characterized by** at least two states of working, respectively an "available" state and a "busy" state of working.

6. System according to one of the claims 1-5, wherein the interlocking data comprise at least a first set of interlocking data when they are determined by the onboard control system (21) and sent by said onboard control system (21) to the wayside local device (22), and at least a second set of interlocking data when they are determined by the wayside local device (22) and designed for being sent to the onboard control system (21).

7. System according to claim 6, wherein the first set of interlocking data comprises at least one of the following items:

- a request for controlling the track device of the interlocking (11);
- a locking message for locking said track device;
- a clear route message configured for confirming that the whole guided vehicle (3) passed the track device of the interlocking (11).

8. System according to one of the claims 6-7, wherein the second set of interlocking data comprises at least one of the following items:

- a setting message configured for describing an actual setting of the track device;
- a message confirming the availability of the track device;
- a message stating the non-availability of said track device (11);
- a security message designed for activating a security process.

9. System according to one of the previous claims, wherein said onboard control system (21) is a portable onboard control system.

10. Method for managing an interlocking (11) at an interlocking area (1), the method comprising the steps of:

- an on board determination of interlocking data in function of a route of a guided vehicle (3) crossing said interlocking (11) by means of an onboard control system (21) usable on board said guided vehicle (3), wherein said interlocking data determined by the onboard control system (21) are designed for configuring and locking a track device of the interlocking (11) according to said route;
- a remote communication of said interlocking data by the onboard control system (21) to a wayside local device (22) configured for being mounted at the interlocking area (1) and capable of establishing said route by controlling and commanding each track device of the interlocking (11);
- a control and command of each track device of the interlocking (11) by the wayside local device (22) for locking/releasing the interlocking (11) according to said interlocking data.

11. Method according to claim 10, further comprising the steps of:

- another on-board determination of interlocking data in function of a route of another guided vehicle crossing said interlocking (11) by means of another onboard control system usable onboard said another guided vehicle;
- a remote communication from said another onboard control system to said local wayside device (22) of interlocking data determined by said other onboard control system;
- a parallel handling by the wayside local device (22) of each interlocking data received from said onboard control system (21) and said other onboard control system; and
- said control and command of each track device by the wayside local device for locking/releasing the interlocking (11) according to the interlocking data from one and only one of said onboard control system (21) and other onboard control system at a time.

12. Method according to one of the claims 10 or 11, comprising the step of a parallel handling by a single wayside local device (22) of track devices of several interlockings (11) of the interlocking area (1).

13. Method according to one of the claims 10-12, **characterized by** at least two states of working of the wayside local device (22) for each track device of the interlocking (11), respectively an "available" state and a "busy" state, the method comprising a change from an available state to a busy state resulting from the reception of the interlocking data of the onboard control system (21), and a change from the busy state to the available state resulting from the reception of a clear route message sent by the onboard control system (21).

14. Method according to one of the claims 10-13, comprising returning to the onboard control system (21) which sent said interlocking data a message from the wayside local device (22) confirming the availability of a track device of the interlocking (11) when said track device is ready for being commanded and controlled according to the interlocking data sent by said onboard control system (21), and returning a message stating the non-availability of the track device of the interlocking (11) when said track device cannot be commanded and controlled according to the interlocking data sent by the onboard control system (21).

15. Method according to one of the claims 10-14, comprising communicating with another onboard control system or with a central work station for coordinating a prioritization of guided vehicles (3) having a route crossing a same interlocking (11).

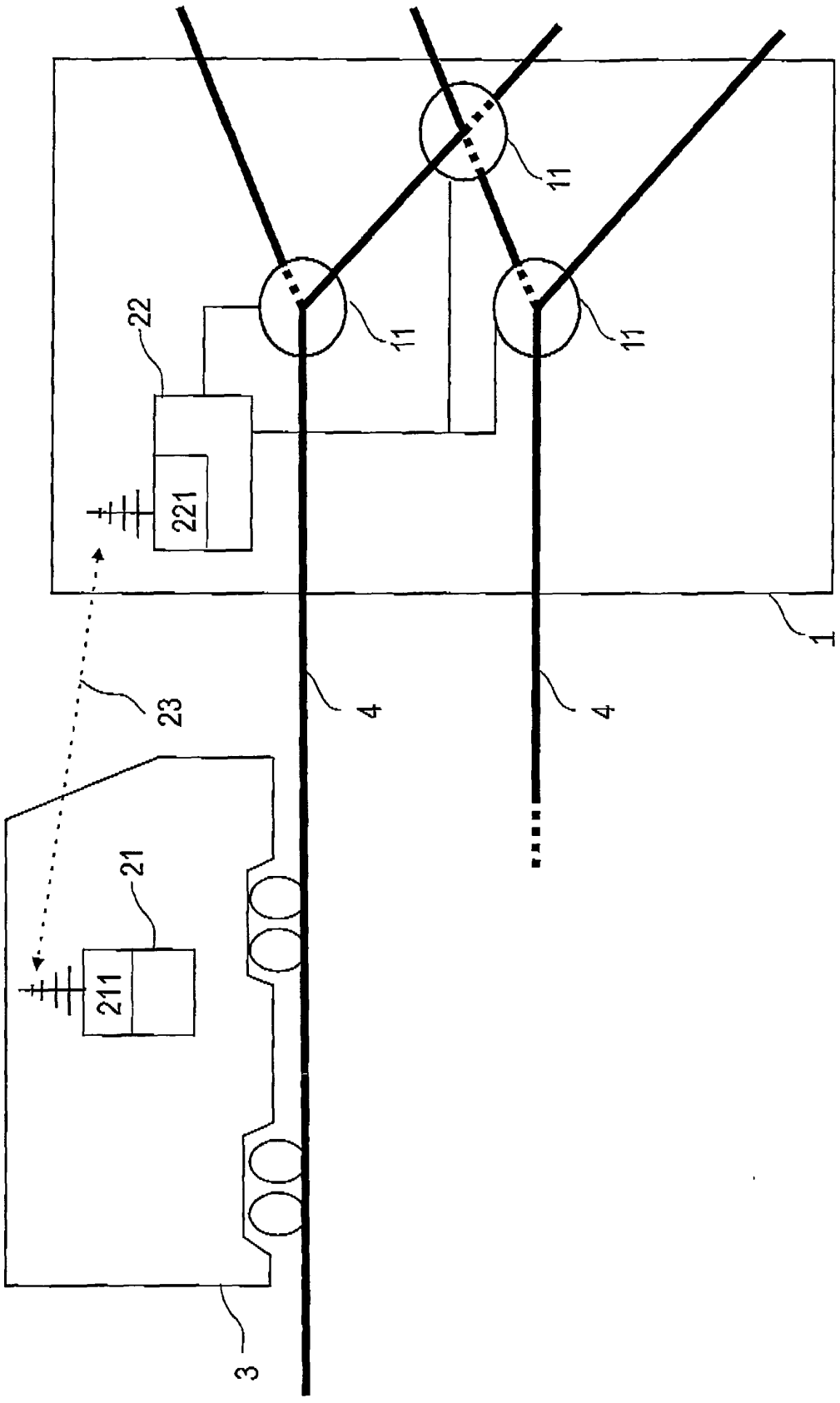

FIG 1

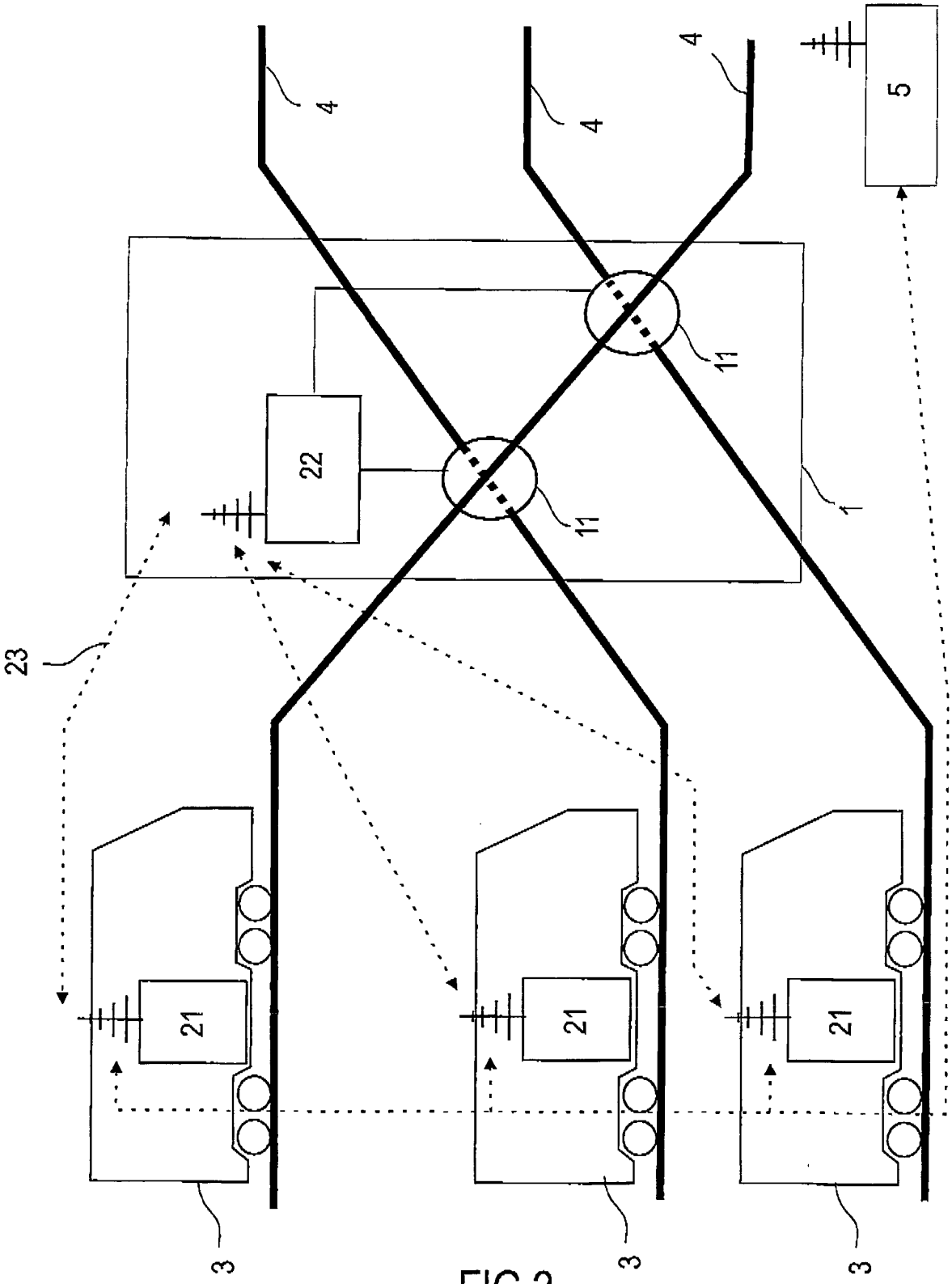

FIG 2

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EUROPEAN SEARCH REPORT

Application Number
EP 11 29 0433

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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	1 February 2012	Janhsen, Axel

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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