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(54) Alarm apparatus, computer program and system

(57) A portable alarm apparatus (10) for mounting on an object (12) such as a vehicle, person, and animal, the apparatus (10) comprising a unit (14) for gathering and processing event information such as velocity, GPS po-

sition etc, the unit being (14) configured to transmit the event information gathered to a central unit (16, 20) for alarm handling such as a server, wherein the alarm apparatus (10) is configured to initiate an alarm handling process algorithm in case of an accident trigger.

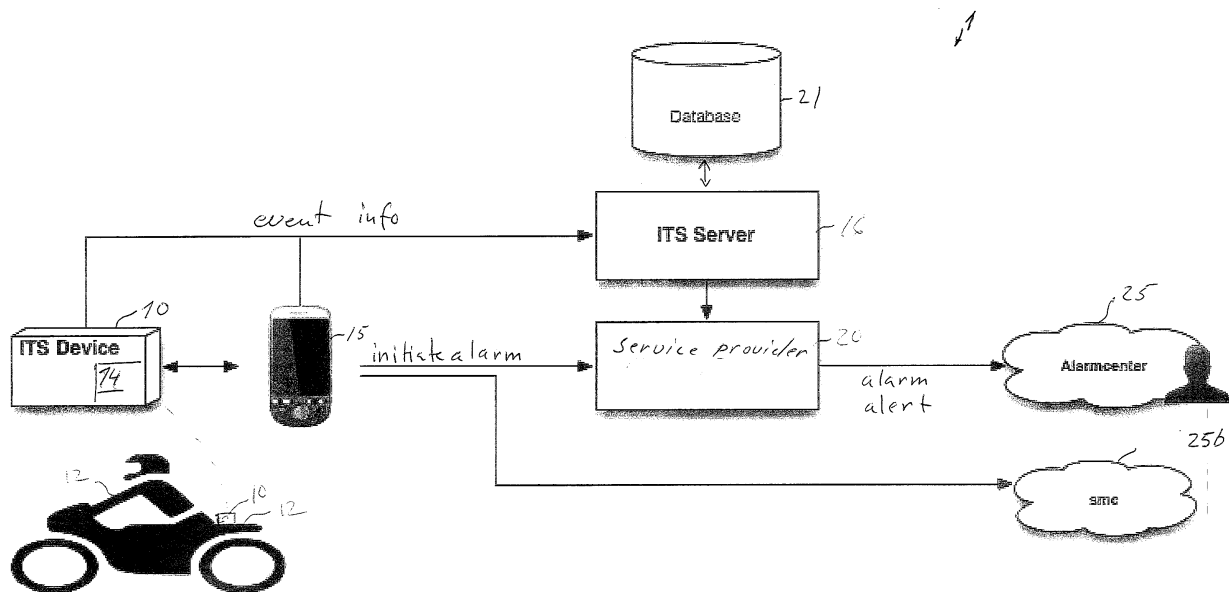


Fig. 1

Description

TECHNICAL FIELD

[0001] The invention relates generally to an alarm apparatus, computer program and system.

BACKGROUND

[0002] In a number of situations such as traffic accidents it is important that an alarm can be transmitted to an alarm handling service center, in the following referred to as an "alarm center". If an accident occurs, quick and suitable help can be determined by the outcome of the accident.

[0003] As, for example, about 40 % of all motor bike accidents are single accidents, i. e. accidents with only one vehicle involved. Most of the single accidents occur on roads having low traffic intensity. Sometimes it even takes time before someone else than the motor bike driver notices that an accident has happened and an alarm can be transmitted to alert a receiver, for instance an alarm center. In worst case, in case of a motor bike single accident, a motor bike driver will not even survive because of having to wait too long time before help.

[0004] Herein this disclosure, a "receiver" can be a physical person or any other device or system suitable for receiving the alarm.

[0005] Today, solutions are known for other vehicles such as cars having some type of automatic alarm system triggered by an action, such as an accident. However, a drawback of known systems for vehicles is that they are only linked to the status, such as indication of crash of vehicle, of the vehicle, not the driver.

[0006] Moreover, the solutions known typically also have the drawback that also false alarms may be transmitted to the alarm handling center. For instance, the alarm may have been triggered by the vehicle despite no crash. Too many false alarms transmitted have the effect that valid, real alarms, for instance when the driver or other vehicle occupants is/are injured, may not always be handled properly by the alarm center. This may in worst case result in no help being sent even if an accident has occurred and a vehicle occupant has been injured.

[0007] Another drawback is that they are typically very expensive and/or bulky, in particular not suitable for small vehicles such as motor bikes.

[0008] There can also be a need to gather information from multiple independent objects, which may be physically separated from each other, such as horse and rider, whose data is compiled and distributed to one or more receivers.

[0009] Herein, the term "object" includes physical objects, vehicles, animals, and humans.

[0010] Based on the above, there is a need to protect and save people's lives, health and property.

SUMMARY OF INVENTION

[0011] An object of the present invention is to protect and save people's lives, health and property.

[0012] According to an aspect of the present invention, there is provided a portable alarm apparatus for mounting on an object. The alarm apparatus comprises a unit configured to gather and process object related event information. The unit is configured to transmit the event information gathered to a central unit for alarm handling, wherein the alarm apparatus is configured to initiate an alarm handling process algorithm in the central unit and/or in a mobile communication device comprising a computer configured to communicate with the alarm apparatus, in case of an accident trigger based on the related event information, wherein an alarm alert is sent to a receiver for performing a relevant action based on a certain combination of event information, in particular comprising three dimensional position information of the object.

[0013] By means of the invention, an alarm is transmitted instantly and typically automatically in case of an accident. Since an alarm is sent to a receiver for performing a relevant action based on a certain combination of event information, provided by the unit configured to gather and process object related event information, false alarms may be avoided. Typically, the event information comprises three dimensional position information, such as inclination in any direction, acceleration, retardation and forces acting sideways on the object.

[0014] According to another aspect, there is provided an application specific computer program, when run in a computer of a driver's mobile communication device causing the computer to receive object related event information gathered and processed by the portable alarm apparatus, detect an event, initiate an alarm handling process, and invoke the central unit to initiate the alarm handling process algorithm.

[0015] By means of the invention, according to this aspect in case of an accident, a receiver, such as an operator at an alarm central receives an alarm from the alarm apparatus, and/or the user's, typically driver's, mobile communication device, such as a smart phone. According to an embodiment, the user's mobile communication device is configured to set up a call to the receiver, whereby the operator may listen remotely to the actual situation at the place of the accident to be able to decide which measures are required, for instance to send an ambulance or the like.

[0016] According to yet another aspect of the present invention there is provided an alarm system comprising a portable alarm apparatus for mounting on an object, a central unit and a receiver. The alarm apparatus comprises a unit configured to gather and process object related event information. The unit is configured to transmit the event information gathered to the central unit for alarm handling, wherein the alarm apparatus is configured to initiate an alarm handling process algorithm in the central

unit and/or in a mobile communication device comprising a computer, in case of an accident trigger based on the related event information, wherein an alarm alert is sent to a receiver for performing a relevant action based on a certain combination of event information, in particular comprising three dimensional position information of the object. The alarm system may also comprise a data base configured to communicate with the central unit.

[0017] In this disclosure throughout, conventional terms and their abbreviations that have been considered to be well-known to the skilled person have been used as much as possible for a better understanding. Since they are considered to be well-known to the skilled person they are used without exhaustive definitions. Thus, only terms considered to require a more exhaustive explanation have been explained in more detail, often by means of concrete examples to assist understanding.

[0018] Further advantages and features of embodiments of the present disclosure will become apparent when reading the following detailed description in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019]

Fig. 1 is a schematic block diagram of an alarm system, in which an embodiment of this disclosure is implemented;

Fig. 2a-b is schematic block flow diagrams illustrating the operation of the alarm handling system in Fig. 1;

Fig. 3 is a flow diagram illustrating an alternative embodiment of the alarm handling system, in which multiple alarm apparatus are provided;

Fig. 4 is a flow diagram illustrating how an embodiment of the application specific computer program can be implemented in the alarm handling system; and

Fig. 5 illustrates example of content of the data base.

DESCRIPTION OF EMBODIMENTS

[0020] Now is referred to Fig. 1, which is a schematic block diagram of an alarm system, in which an embodiment of this disclosure is implemented.

[0021] The alarm system 1 comprises a portable alarm apparatus 10, herein an incident tracking device (ITS) device, for mounting on an object 12, herein a motor bike, and possibly also a driver of the motor bike. The system 1 further comprises a central unit 16, 20, herein divided into two separate units, and ITS server 16 and a service provide server 20, and a first receiver 25, all units 16, 20, 25 configured to communicate with the alarm apparatus 10. The system 1 may also at least communicate with, or even comprise, a mobile communication device 15, typically a smart phone of the driver. A second receiver 25b may also be provided and configured to communi-

cate with the alarm apparatus 10. A service provider data base 21 may also be provided, as illustrated. The data base 21 is configured to communicate with at least the ITS server 16, but may also communicate with the service provider server 20 and/or the mobile communication device 15. The data base 21 will be described in more detail as follows.

[0022] The alarm apparatus 10 comprises a unit 14 configured to gather and process object related event information event info corresponding to one or more particular actions, for instance an vehicle accident or other vehicle incident. The unit 14 is configured to transmit the event information event info gathered at a particular interval, for instance every 5 seconds, to the central unit 16, 20 for alarm handling, wherein the alarm apparatus 10 is configured to initiate an alarm handling process algorithm alarm in the central unit 16, 20 and/or in the mobile communication device 15, in case of an action trigger based on the related event information, wherein an alarm alert (alarm alert) is sent to the first receiver 25 for performing a relevant action based on a certain combination of event information event info, in particular comprising three dimensional x, y, z position information of the object.

[0023] Herein, the term "action" is an event that happens in real-time that is measurable by known variables/parameters.

[0024] By using an apparatus 10 mounted on an object such as a vehicle 12, a person, a riding animal, for instance a horse, or any other object, information is gathered and processed by the alarm apparatus 10. The information is continually sent to and stored on the servers 16, 20 and/or database 21. One or more actions, in particular certain combinations of events initiate predefined processes such as the alarm alert describe above.

[0025] The apparatus 10 contains all components necessary to do its job independently, including communication over mobile telephony networks, but may also use the mobile communication device 15 to some extent for instance to set up and receive a voice or video call. This will be explained as follows.

[0026] A typical process is some kind of alarm that indicates an accident, or other incident such as theft or unauthorized use. The apparatus 10 initiates the process and the service provider server 20 alerts an alarm operator. All gathered information is presented to the receiver 25, for instance to an alarm operator of an alarm center, so that the receiver, herein the operator, can make the correct decisions about what actions to take for the given situation.

[0027] Now is referred to Fig. 2a-b, which are schematic block flow diagrams illustrating the operation of the alarm handling system in Fig. 1.

[0028] According to an embodiment, as illustrated in Fig. 2a, the apparatus 10 comprise an accelerator configured to detect and/or record acceleration of the object 12, and/or a gyro meter configured to record orientation of the object 12, and/or a position system (GPS) config-

ured to record position of the object 12. In this way, the alarm apparatus 10 can be used to gather and process, typically analyze, information from a given event by known variables/parameters, such as GPS position Inclination (measured by a gyro), velocity (using a velocimeter or a combination of position and time), G-force, or compass bearing.

[0029] The alarm apparatus 10 is further responsible to communicate the given measurements to either other compatible devices such as other alarm apparatuses, as illustrated in Fig. 3 illustrating an alternative embodiment of the alarm handling system, in which multiple alarm apparatus are provided to which is referred, and/or to a given server backend system comprising the ITS server 16, the service provider server 20, and possibly the data base 21, as illustrated in Fig. 1. This embodiment may find application for instance for horse back riding, wherein one apparatus is provided on the horse, one apparatus on the person riding the horse. Some trigger is then provided indication that a contact between the horse and the person riding thereon has been disconnected. To be sure that there is no false alarm, for instance that the person riding has only stepped down from the horse on purpose but forget to inactivate the alarm, the alarm apparatus can be configured to measure two conditions for instance: 1. the horse was moving say the last 10 seconds before alarm being triggered and 2. The person continues riding. If only the first 1 of these conditions 1 and 2 are fulfilled, it is considered to be a true alarm. Then an alert is sent to the receiver 25 typically with sound from to determine relevance of alarm. If the person riding continues riding in the same direction and at the same speed, the system (or the operator at the receiver 25) deletes the alarm.

[0030] An advantage with the present invention is that always the person, for instance a person riding a horse, or a motor bike, is primarily protected, not only, or primarily, the vehicle, the horse, etc. itself. This is an advantage compared to prior art, wherein the vehicle is primarily protected. For instance, if the alarm is only linked to what happens with the vehicle, the vehicle triggers the alarm, but the operator at the receiver does not know what has happened the person, which may be dead or alive.

[0031] The alarm apparatus can include algorithms used to create a measurement of an action. The central unit 16, 20, herein a server, receives, stores and processes information received from a plurality of alarm apparatuses 10 mounted on a plurality of objects 12. In the event of an action, the server(s) 16, 20 perform(s) a predefined process, such as an alarm. The data base 21 may alternatively store some or all of the information.

[0032] As illustrated in Fig. 2a, the alarm apparatus 10 can be configured to communicate with a mobile communication device 15 of a user of the object 12 for communication with the central unit 16, 20, herein the service provider server 20.

[0033] An application specific computer program 15a, when run in a computer 15b, herein provided by a proc-

essor and memory of the smart phone 15 causes the computer 15b to receive object related event information (event info) gathered and processed by the portable alarm apparatus (10), for instance to record route; detect an event, for instance an accident, crash, record accident time; acceleration, orientation, position (See Fig. 2b); initiate an alarm handling process including sending route to the service provider server 20, possibly including time, and position and to invoke the central unit 16, 20 to initiate the alarm handling process algorithm (alarm), in particular to send alarm alert to alarm center 25. This embodiment is useful for instance on a motor bike.

[0034] Herein, the term "computer" is defined to include any programmable apparatus, including e.g. a mobile phone and in particular a smart phone. A computer program is synonymous with "program", "software" and "program for a computer".

[0035] The application specific computer program may also be configured to set up a voice and/or video call with the receiver 25 via the central unit 16, 20 for alarm handling. In this way, audio can be streamed from the smart phone 15, indicating if there is a real accident, for instance no sound at all from the driver, or indicating that only an incident has occurred such as dropped motor bike, but no driver injuring accident. In this way, the operator can decide that no ambulance has to be sent in some cases.

[0036] Algorithms used to initiate processes may vary from case to case. An example of such an algorithm may be a combination of a rapid velocity decrease to zero in combination with the decline of a motor bike going from <45 degrees to >65 degrees, which would mean that the motorcycle has turned over on its side and come to a sudden stop, indicating that an accident has occurred. In this way, the operator can decide that an ambulance has to be sent in some cases.

[0037] Other algorithms may include geo-fencing, which means marking areas on a map and triggering events when an object, such as a device, or animal, moves out of or into a geo-fenced area.

[0038] The receiver 25, herein an alarm center, is an external part that uses information from the server 16, 20 to perform relevant actions, such as receive incident, handle incident, view map over route, see crash location on map and listen to audio stream (See Fig. 2b), based on information collected by alarm apparatuses and algorithms. More than one receiver 25 may be provided such as the second receiver 25b, for instance a motorbike organization (smc), as illustrated in Fig. 1.

[0039] Now is referred to Fig. 4, which is a flow diagram illustrating how an embodiment of the application specific computer program can be implemented in the alarm handling system.

[0040] In a first step 401, the application computer program is started. Then it is checked if the application is started for the first time, step 402. In case of YES, an account is created, or login into existing account is performed, step 403, 406. A flag may be set regarding "first started" from true to false, step 404. This can be stored

in the phone, step 405. Record of new or existing account to phone can be saved so that the user does not have to login again afterwards, step 407.

[0041] If application was not started for the first time, 402, and it is checked if user is signed in, step 408. If no, 5
phone store is checked for account data, with phone storage, 410. If account data exist, 411, account is loaded, 412. This is communicated with phone storage, 413. If not, account is created, 403.

[0042] If user is signed in, 408, it is checked if phone 10
is connected to alarm apparatus (herein labeled "device", 414). If YES, this is shown on main screen, 415 and the application computer program is now ready to be used, 416. If NO, it is connected to the apparatus, 417 to achieve connection success. If connection is failed, it is checked if communication such as Bluetooth is enabled on phone, 418. If YES, troubleshoot is shown on apparatus screen, 419. If NO, Bluetooth settings are shown on screen, 420.

[0043] Now is referred to Fig. 5 illustrating examples of data in data base 21. 20

[0044] Examples of areas of use of the invention are the following:

[0045] Motorized vehicles such as: motor bikes (125CC and above), mopeds (under 125CC), four-wheeled motor bikes, cars, motorized wheel chairs, construction machines, forklifts, ATW:s, snow mobiles, scooters and boats. 25

[0046] Non-motorized vehicles such as: bicycles, tri-cycles, hang gliders, parachutes, canoes and rowing boats. 30

[0047] Healthcare measurements such as: heart rate, blood pressure, brain activity, oxygen intake, stress levels and blood sugar levels (diabetes).

[0048] Animals such as: horseback riding, harness racing, donkey riding, camel riding, and sled dog racing. 35

[0049] Agriculture such as: livestock, honeybee colonies and farming machinery.

[0050] Miscellaneous use such as: home appliances.

[0051] It will be evident to the skilled person that, in various embodiments, the invention can be implemented by a combination of hardware and software. 40

[0052] In the drawings and specification, there have been disclosed typical embodiments and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being set forth in the following claims. 45

Claims

1. A portable alarm apparatus (10) for mounting on an object (12), the alarm apparatus (10) comprising an unit (14) configured to gather and process object related event information (event info), the unit (14) being configured to transmit the event information (event info) gathered to a central unit (16, 20) for alarm handling, wherein the alarm apparatus (10) is

configured to initiate an alarm handling process algorithm (alarm) in the central unit (16, 20) and/or in a mobile communication device (15) comprising a computer (15a), in case of an accident trigger based on the related event information, wherein an alarm alert (alarm alert) is sent to a receiver (25) for performing a relevant action based on a certain combination of event information (event info), in particular comprising three dimensional (x, y, z) position information of the object.

2. The portable alarm apparatus (10) according to claim 1, configured to communicate with the mobile communication device (15) of a user of the object (12) for communication with the central unit (16, 20).

3. The portable alarm apparatus (10) according to claim 1 or 2, configured to communicate with the mobile communication device (15) configured to invoke the central unit (16, 20) to initiate the alarm handling process algorithm (alarm).

4. The portable alarm apparatus (10) according to any one of the claims 1-3, comprising an accelerator configured to detect and/or record acceleration of the object (12).

5. The portable alarm apparatus (10), according to any one of the claims 1-4, comprising a gyro meter configured to record orientation of the object (12).

6. The portable alarm apparatus (10), according to any one of the claims 1-5, comprising a position system (GPS) configured to record position of the object (12).

7. An application specific computer program (15a), when run in a computer (15b) causing the computer (15b) to:

- receive object related event information (event info) gathered and processed by the portable alarm apparatus (10) according to any one of the claims 1-6;
- detect an event;
- initiate an alarm handling process
- invoke the central unit (16, 20) to initiate the alarm handling process algorithm (alarm).

8. The application specific computer program according to claim 7, configured to:

- set up a voice and/or video call with the receiver (25) via the central unit (16, 20) for alarm handling.

9. The application specific computer program according to claim 7, configured to record one or more of

the following parameters: object route, accident time, acceleration, orientation, position of object and to transmit one or more of the parameters to the receiver (25).

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10. The application specific computer program according to claim 7, configured to stream audio and/or video from the communication device (15) to the receiver (25).

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11. An alarm system (1) comprising a portable alarm apparatus (10) for mounting on an object (12), a central unit (16, 20) and a receiver (25), configured to communicate with the alarm apparatus (10), the alarm apparatus (10) comprising an unit (14) configured to gather and process object related event information (event info), the unit (14) being configured to transmit the event information (event info) gathered to a central unit (16, 20) for alarm handling, wherein the alarm apparatus (10) is configured to initiate an alarm handling process algorithm (alarm) in the central unit (16, 20) and/or in a mobile communication device (15) comprising a computer (15a), in case of an accident trigger based on the related event information, wherein an alarm alert (alarm alert) is sent to a receiver (25) for performing a relevant action based on a certain combination of event information (event info), in particular comprising three dimensional (x, y, z) position information of the object.

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12. The alarm system according to claim 11, wherein the central unit (16, 20), and/or the data base (21) is configured to save at least one of the following parameters: acceleration, orientation, position of the object, route data, or audio stream from portable communication device.

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13. The alarm system according to claim 12 or 13, configured to receive alarm invoked by application specific program (15a) in portable communication device (15).

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14. The alarm system according to any one of the claims 11-13, configured to create and transmit alarm alert (alarm alert) to the at least one receiver (25).

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15. The alarm system according to any one of the claims 11-13, configured to save and display accidents.

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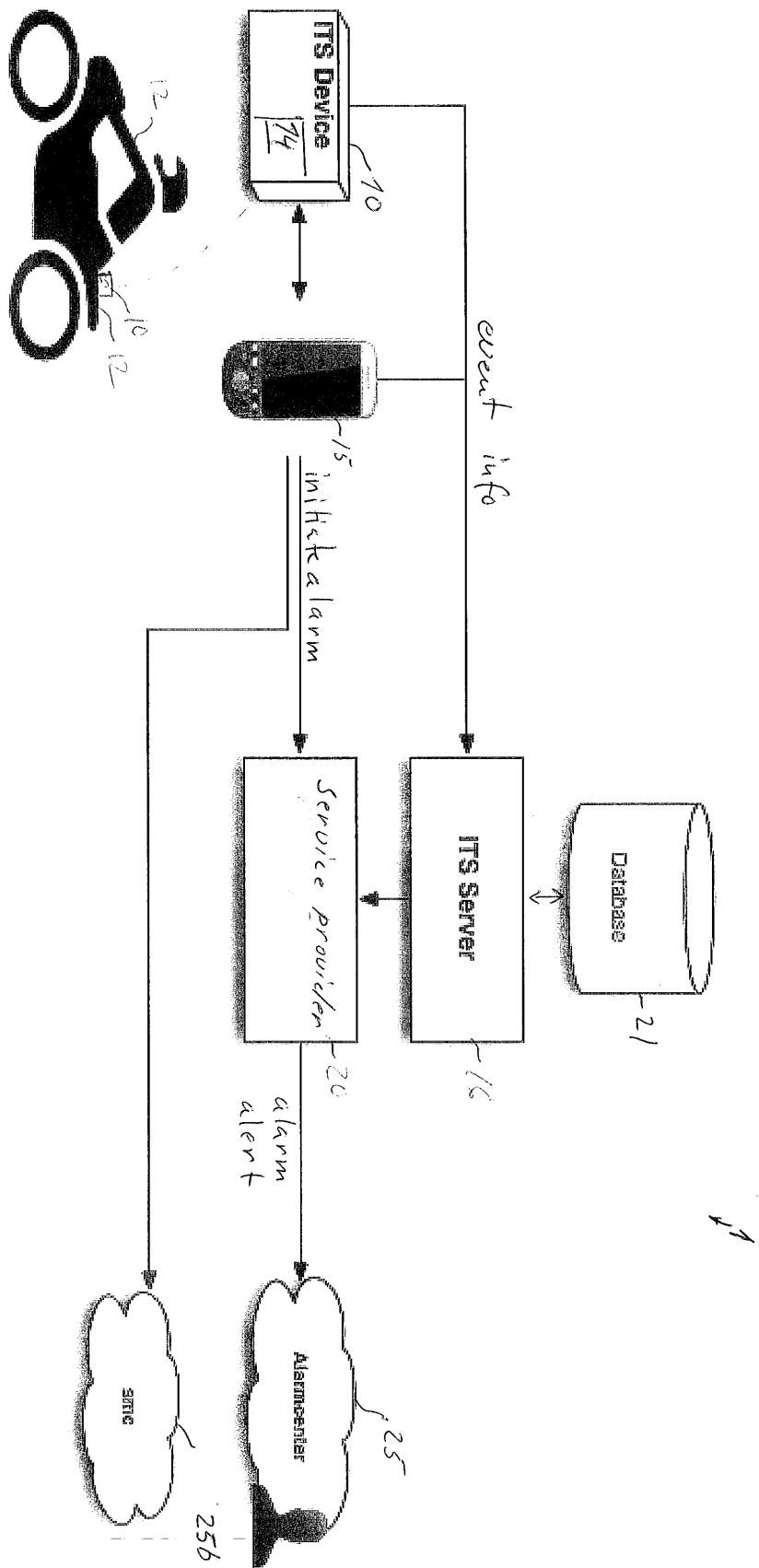


Fig 1

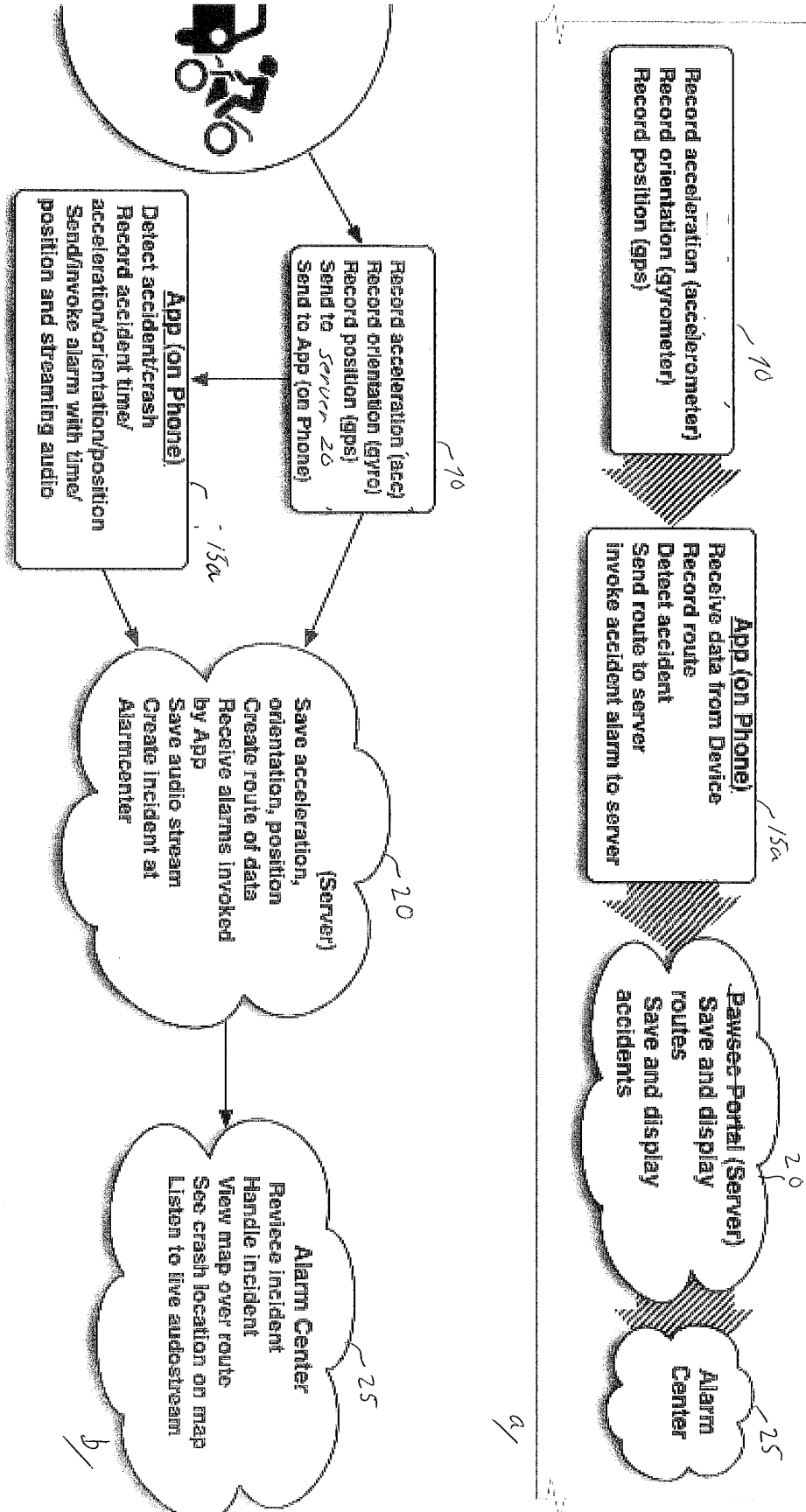


Fig. 2a-b

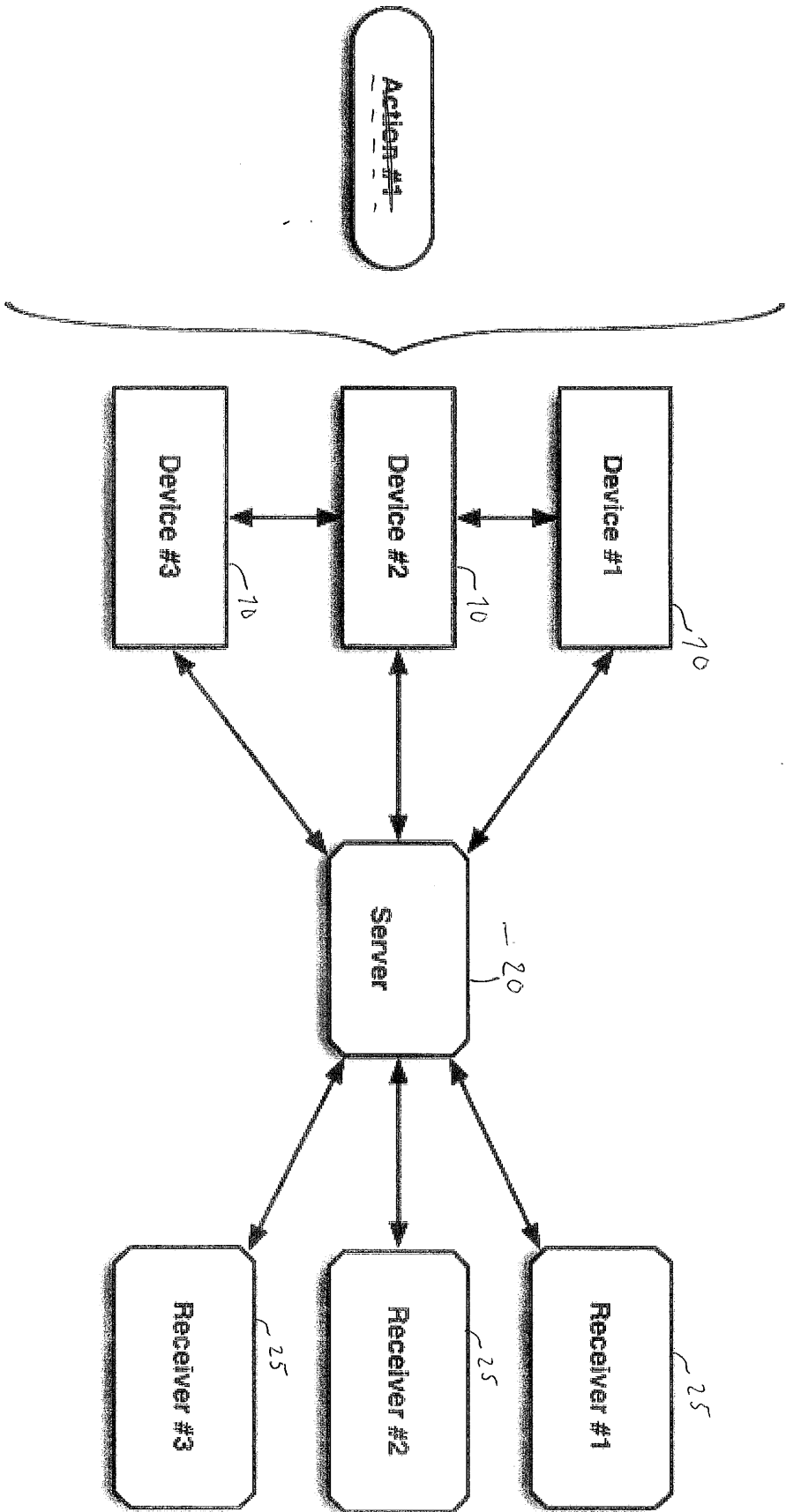


Fig. 3

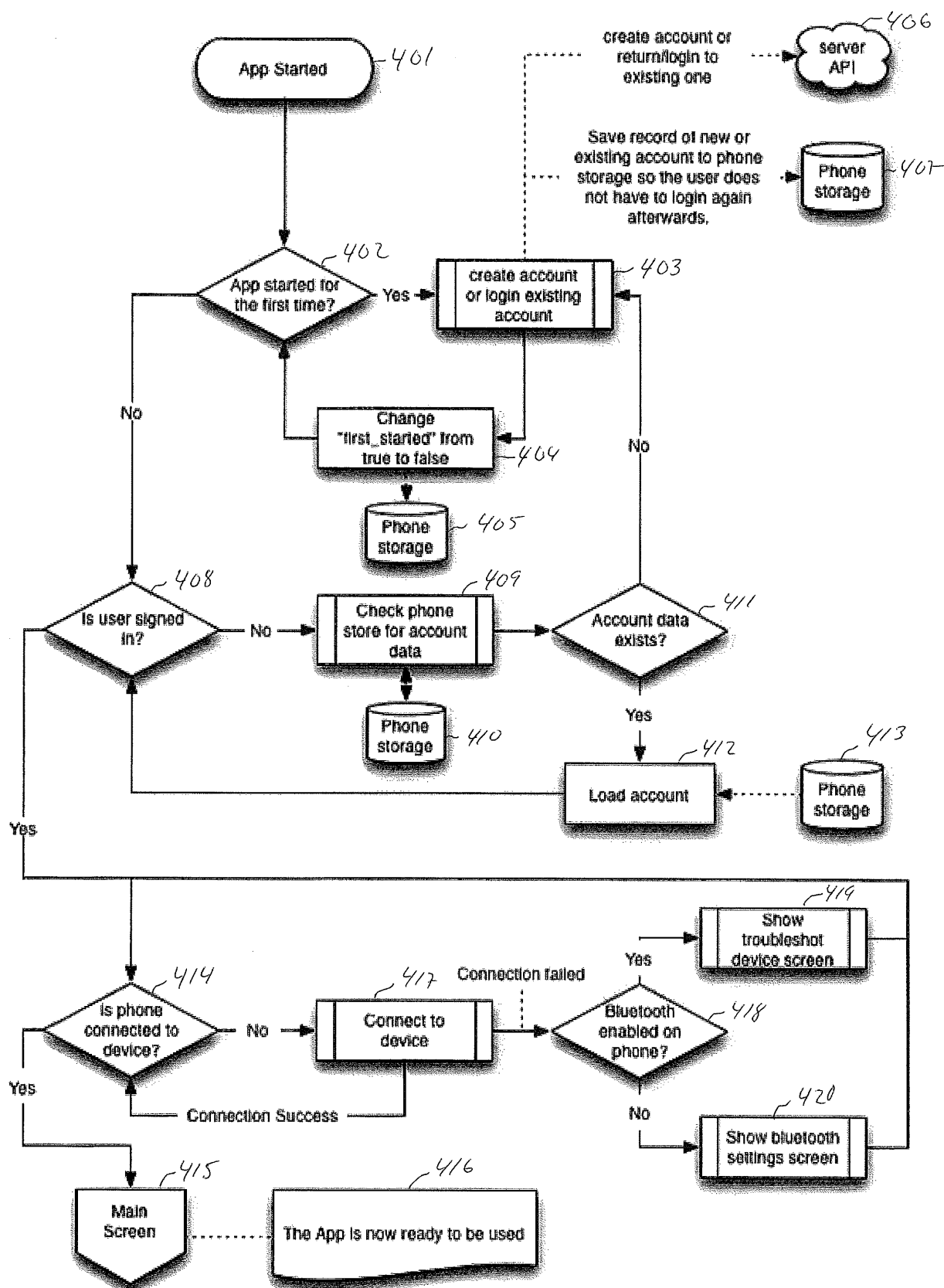


Fig. 4

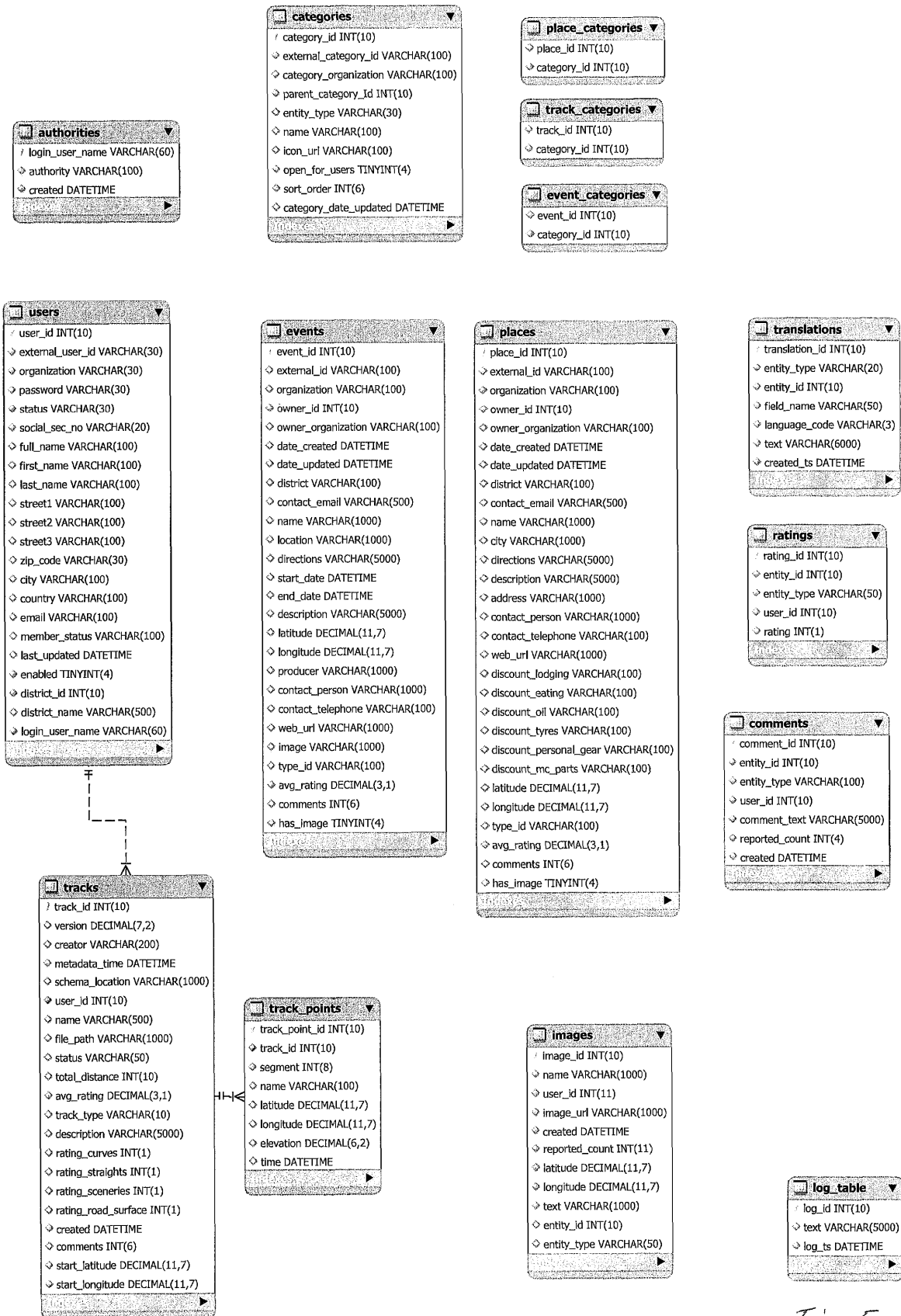


Fig. 5



EUROPEAN SEARCH REPORT

Application Number
EP 13 15 2876

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 22 April 2013	Examiner Fagundes-Peters, D
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	

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EPO FORM 1503 03-82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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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
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