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*[Continued on next page]*

(54) Title: TRANSFERRING MESSAGES IN A COMMUNICATIONS NETWORK

(57) Abstract: A method and apparatus for transferring a message from a wireless communication device to another communication device. A communications device generates a message using the wireless communication device. The wireless communication device determines a geographical location and an orientation of the wireless communication device. A geographical region is determined using the geographical location and orientation, and a remote server determines the presence of an entity associated with the other communication device in the selected geographical region. The message is then transferred to the other communication device.

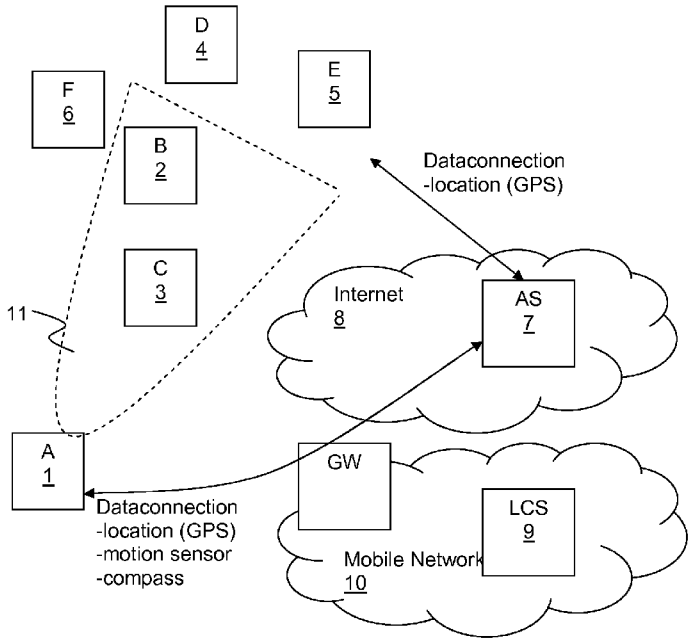



Figure 1

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**Published**:

— *with international search report (Art. 21(3))*

# Transferring Messages in a Communications Network

## TECHNICAL FIELD

The invention relates to the field of transferring messages in a communications network.

## BACKGROUND

Wireless mobile communications networks typically rely on an address, such as an IP address or a telephone number, in order to allow a user to communicate with another user. When a sending user wishes to send a message to a receiving user, for example a Short Message Service (SMS) message or a message for establishing a telephone call, the sending user must already know the address of the receiving user.

There are some circumstances where the sending user does not have access to the address of the receiving user. For example, consider the situation where the sending user is watching a football match at a pub, and the user does not have the addresses of any of the other people in the pub. If the sending user wishes to share, for example, media content such as a news flash, with the other people in the pub, he has no way of doing this as he does not have the addresses of the other people present.

One way to send a message without knowing the receiving user's address is to create a short range Personal Area Network (PAN) using a technology such as Bluetooth ™. The message can then be sent to other users within the range of the PAN who have communication devices using compatible PAN technology, and are willing to accept the message. However, PANs typically have a very limited range, and the message can only be sent to receiving users who have communication devices with compatible hardware.

Another way to send a message without knowing the receiving user's address is to use a technology such as infra red (IR) data transmission. A modulated IR beam is generated by the sending user's communication device and used to encode the message. In order for the receiving user to receive the message, the receiving user's communication device must have a line-of-sight with the sending user's communication

device. IR data transmission is therefore only suitable for very short ranges and communication with no more than one communication device at a time.

SUMMARY

It is an object of the invention to mitigate the problems associated with known ways communicating with other communication devices when the address of the recipient is not known. The invention relies on determining the location of the other communication device or an entity associated with the communication device on the basis of the orientation or direction of motion of the communication device.

According to a first aspect of the invention, there is provided a server for use in a wireless communications network. The server is provided with a receiver for receiving from a communication device information usable to identify a geographical region relative to a geographical location and an orientation of the communication device. A presence function is also provided for determining the presence of an entity associated with another communication device, the entity being located in the identified geographical region. A transmitter is provided for either sending a message to the other communication device, or sending an address associated with the other communication device to the communication device. In this way, a message can be forwarded to the other communication device, or communication device can use the received address to send a message to another communication device.

The server is optionally provided with a geographical region determination function for determining a geographical region using a received geographical location and orientation the communication device.

As an option, the receiver is arranged to receive a message from the communication device, and the transmitter is arranged to forward the message to the other communication device.

According to a second aspect of the invention, there is provided a mobile communication device for use in a wireless telecommunications network. The mobile communication device is provided with a message generating function for device to generate a message. A geographical location function is provided for determining a

geographical location of the communication device, and an orientation determination function is also provided for determining an orientation of the communication device. A transmitter is provided for sending the message to a further communication device associated with an entity located in a geographical region determined using the determined geographical location and orientation. This allows a user of the communication device to point at a geographical location, and send a message to other communication devices associated with entities in that geographical region, without the user needing to know the addresses of the other communication devices.

As an option, the communication device is provided with a motion detection function for detecting a motion of the wireless communication device in the direction of the geographical location of an entity associated with the other communication device. The transmitter is arranged to send the message as a consequence of the motion, which allows the user to "throw" a message to another communication device.

Optionally, the transmitter is arranged to send the determined geographical location and orientation to a remote server, in which case the remote server can determine the geographic region.

The transmitter is optionally arranged to send the generated message to the remote server for forwarding by the remote server to the further communication device. Alternatively, the communication device is provided with a receiver for receiving from the remote server an address of the further communication device, in which case the transmitter is further arranged to send the generated message to the further communication device using the received address.

Whilst it has been described above that a remote server can determine the geographical region, as an optional alternative, the communication device may be provide with a geographical region module arranged to determine the geographical region relative to the geographical location and direction of orientation. In this case, the transmitter is further arranged to send the determined geographical region to a remote server.

According to a third aspect of the invention, there is provided a method of transferring a message from a wireless communication device to another communication device. A

user generates a message using the wireless communication device. The wireless communication device determines a geographical location and an orientation of the wireless communication device. A geographical region is determined using the geographical location and orientation, and the presence of an entity associated with the other communication device in the selected region is determined. The message is then transferred to the other communication device.

As an option, the method further comprises detecting a motion of the wireless communication device in the direction of the geographical location of an entity associated with the other communication device, and transferring the message to the other communication device as a consequence of detecting the motion. As a further option, a distance between the geographical region and the wireless communication device is determined by the velocity of the motion.

Optionally, the entity associated with the other communication device is the other communication device.

As processing power is typically limited at the wireless communications device, the steps of selecting a geographical region in the direction of orientation and determining the presence of the entity associated with the other communication in the selected region are optionally performed at a remote server. In this case, the remote server optionally either forwards the message to the other communication device, or sends an address of the other communication device to the communication device, thereby allowing the communication device to send the message to the other communication device.

According to a fourth aspect of the invention, there is provided a computer program, comprising computer readable code means which, when run on a server, causes the server to behave as a server as described above in the first aspect of the invention.

According to a fifth aspect of the invention, there is provided a computer program, comprising computer readable code means which, when run on a communication device, causes the communication device to behave as a communication device as described above in the second aspect of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates schematically in a block diagram a network architecture according to an embodiment of the invention;

Figure 2 is a flow diagram illustrating embodiments of the invention;

Figure 3 illustrates schematically in a block diagram a communication device according to an embodiment of the invention; and

Figure 4 illustrates schematically in a block diagram a server according to an embodiment of the invention.

DETAILED DESCRIPTION

A sending user having a communication device wishes to send a message to a communication device associated with an end-point. The sending user does not have an address for the end-point, but simply knows the approximate geographical location of the end-point relative to the sending user.

In one embodiment, the end-point is the communication device associated with the end-point, for example when the sending user's communication communication device is used simply to send a message to another communication device based on that communication device's location. In an alternative embodiment, the end-point may be geographically remote from the communication device associated with the end-point. For example, the end-point may be a historical building, and the communication device associated with the historical building is a library or City server that holds historical information on the historical building. In the first embodiment, the geographical location of the end-point (i.e. the communication device), is dynamic. In the alternative embodiment, the geographical location of the end-point is static. The invention will work in either case provided that accurate and up-to-date information about the geographical location of the end-point is available.

In order for the user to send the message according to the geographical location of the end-point, the user generates the message using their communication device, and

moves their communication device in the geographical direction of the required end-point. This may be in the form of a throwing action. The user communication device, determines the direction of movement. A forwarding message is then sent to a remote server. The forwarding message includes the generated message, and the determined direction of movement. The remote server uses the current geographical location of the communication device and the determined direction of movement to select one or more end-points that the message can be sent to. Information about other end-points is stored (which may be dynamically updated where the end-points location can change) and, based on the calculated path, the possible destinations are resolved from the collection of known end-points. The generated message is then sent to communication devices associated with those end-points

The location of the first user communication device can be determined using any suitable mechanism, for example by determining the mobile cell via which the communication device is attached to the communication network, using Global Positioning System (GPS) data, using indoor positioning (WLAN), and so on.

Once the message has been generated, the trigger for sending it is the throwing action made by the user in the desired direction applying a desired force. By collecting sensor information about the movement (for example using one or more motion sensors) of the communication device, and geographical direction (for example using an eCompass) of the communication device, the point of origin is determined in addition to the bearing and distance of the message.

Figure 1 illustrates an example in which User A 1 wishes to send a message in a certain direction. In this example, users B 2, C 3, D 4, E 5 and F 6 all use the same application and are registered with an Application Server (AS) 7 located in Internet 8. When a user starts the application on the mobile phone, the current position is sent to the AS 7. In case of non-GPS terminals, the position can be retrieved using the user's operator Location Services (LCS) application 9 located in the user's mobile access network 10.

User A 1 wishes to throw a message in a certain direction, for example the users B 2 and C 3 in a pub. User A 1 composes the message using the application on the communication device (mobile phone) and makes a throwing movement in the target

direction (toward the users in the pub). When the throwing movement comes to a stop, an application at User A's communication device collects information relating to the current location of the communication device, movement information from a motion sensor at the communication device, and direction of movement from an electronic compass. The information is sent to the AS 7. Optionally, User A 1 can indicate the type of notification that should be sent to the receiver of the message. Of course, whilst the description is based on a "throwing" movement, it will be appreciated that the invention could also be implemented in a "point and click" way. In this way, the user simply points his communication device in a certain direction and "clicks" to send the message. A determination of motion is not made in this case, but a determination of the orientation of the device is required to determine the direction.

The AS 7 determines the flight sector 11 of the message by using the information sent by User A 1. The flight sector 11 is a geographical region that corresponds to a calculated path of "flight" that the message would take if it were a physical object that had been thrown. The AS 7 then uses location information of other end-points registered with the AS to determine possible target end-points within the flight sector. In this example, the AS 7 determines that User B 2 and User C 3 are end-points within the flight sector 11.

The AS 7 sends a notification to the Users B and C 2, 3 of the incoming message. using a data-channel. A response message may be sent to User A 1 indicating that the message has been successfully delivered, and possibly the identities and/or addresses of the users 2, 3 to whom the message has been successfully delivered.

When Users B and C 2, 3 receive the notification, the each decide whether to accept the message, or not. If the user accepts the message, the AS 7 delivers the generated message to each accepting user. If a user declines to accept the message, or does not respond to the notification, then the generated message will not be delivered and eventually will be deleted after a predetermined message time-to-live.

The size of the flight sector can vary on factors such as the speed of motion, angle of elevation, rotational motion etc. It can also vary depending on application. In some scenarios it might be desirable to throw a message hundreds of kilometres, for example from Helsinki to Turku. In this case, the size of the flight sector relative to the

speed of throwing motion may be larger than an application where it is sufficient to be able "throw" a message across a room.

In an alternative embodiment otherwise compatible with the first embodiment, User A's communication device 1 calculates the flight sector and sends this directly to the AS 7, which then determines other end-points in the flight sector.

The services are not limited to sending messages between end-points, but any service provided by the communication network may be initiated. For example, a voice call may be established between User A 1 and User B 2. The service may also be used to leave messages at certain locations or areas for other end-points to detect when entering the specified location or area. For example, User A 1 may "throw" a message at an electronic notice board for storage at the notice board. Note that the notice board need not contain the communication device, but may simply be an entity at a particular geographical location that ha a remote communication device associated with it.

Referring to Figure 2, the invention is illustrated in a flow diagram with the following numbering corresponding tot he numbering of Figure 2:

S1. User A 1 generates a message using his communication device.

S2. User A 1 moves his communication device towards an end-point to which he wishes to send the message.

S3. User A's communication device detects its geographical location, the direction of movement, and in one embodiment a velocity of movement. In one embodiment, the communication device determines the flight sector 11 using the location and movement information.

S4. User A's communication device sends a message to the AS 1. The message may contain the generated message in addition to either the determined flight sector 11 or the location and movement information.

S5. If the message sends the location and movement information, then the AS 7 determines the flight sector 11.

S6. The AS 7 determines end-points having a geographical location within the flight sector, and, if any end-points are not communication devices, then the AS 7 determines the communication devices associated with those end-points

S7. The AS 7 either forwards the generated to the determined endpoints, or sends a message to User A's communication device with the addresses of the communication devices associated with the end-points, allowing User A's communication device to send the generated message to the communication devices associated with the end-points.

Referring now to Figure 3, there is illustrated a communication device 12. The communication device 12 is provided with a user input device 13 such as a keyboard or touch screen that allows a user to input information. The input device 13 is operatively connected to a message generating function 14 that generates a message.

A geographical location function 15 is provided for determining the geographical location of the communication device 12. The geographical location function may determine the location using, for example, GPS, an operator-enabled location based service, WiFi location system and so on.

A motion sensor 16 is used to detect a motion and a direction of the motion. It may also detect a velocity of motion and an elevation of motion, to assist in calculating a flight sector. This may be coupled to an ecompass 17 to provide directional information. In an alternative embodiment, only the ecompass is required to provide orientation information.

In an embodiment of the invention, the communication device is provided with a geographical region calculating module 18 for calculating the flight sector using the information obtained from the geographical location function 15, motion sensor 16 and ecompass 17.

A transmitter 19 is provided for sending information to the AS 7. This information may include the generated message, and either the calculated flight sector or the geographical location and motion information.

A receiver 20 is provided for the embodiment of the invention in which the AS 7 replies to the communication device 12 with a list of addresses of communication devices associated with end-points. In this case, the transmitter 19 may be further used to send the generated message to the communication devices associated with the endpoints.

The above description assumes a hardware implementation of the invention, although the skilled person will appreciate that certain elements, for example, the geographical location function 15 and the geographical region calculating module 18 may be implemented using software. In this case the device contains a computer readable medium in the form of a memory 21 at which a computer program 22 is stored, and a processor 23 for running the computer program.

Referring now to Figure 3, there is illustrated an AS 7. The AS 7 is provided with a receiver 24 for receiving a communication from the communication device 12. As described above, this may include a generated message, a calculated flight sector, or location and orientation (and possibly motion) information relating to the communication device 12. Where the communication only includes the location and orientation (or motion) information, a geographical region determination function 25 is provided for determining the flight sector 11.

A presence function 26 is provided for determining the presence of entities located in the flight sector 11, and for identifying a communication device associated with each entity.

A transmitter 27 is provided for either sending the generated message to the identified communication devices, or for sending addresses of the identified communication devices to the communication device 12. User A 1 sender of the message may choose to deliver the generated message as a “multi-cast”, where the generated message is sent to multiple receivers, or as “single-shot”, where the message can be received by only a limited number of receivers who match a predetermined profile (e.g. supporters of a particular football team). In this case, User A must specify parameters relating to the intended recipients.

The above description assumes a hardware implementation of the invention, although the skilled person will appreciate that certain elements, for example, the presence function 26 and geographical region determination function 25 may be implemented using software. In this case the device contains a computer readable medium in the form of a memory 28 at which a computer program 29 is stored, and a processor 30 for running the computer program.

The above description refers to User A sending a message to one or more further communication devices associated with endpoints located in a geographical region relative to the location and direction of movement of User A's 1 communication device. The term "message" is used to refer to any type of signalling that the communication device sends or receives, such as signalling to set up a session (for example a SIP INVITE), a message containing media content, and so on. The skilled person will appreciate that the message can take many forms, and the following list is a non-exhausted list of examples of the types of message that may be sent:

- Messages related to gaming;
- geo-caching;
- remote ping-pong (which allows remote users still to play games such as ping-pong);
- virtual phone throwing (phone throwing is a growing sport in which participants must throw a mobile telephone as far as they can. This results in damage to the mobile telephone. Using the invention, the mobile telephone need not be physically thrown);
- chain-letters;
- advertising;
- multicasting a message to users within an area;
- augmented reality (allowing the user to interact with a virtual world based on the orientation, location and motion of his communications device);
- "throwing" a request towards a static subject such as a building or statue and receiving information relating to the subject
- car parking payments; pay parking fee based on the position of the user's car;
- establishing a telephone call with a user;
- exchanging contact information;
- security (for example, a door can only be accessed by a user with the right device).

Various community services can also be enhanced using the invention. For example messages can be sent to members/friends in a specific community (e.g. Facebook ™) in a specified area. Messages may be also published on Facebook on the recipients' displays. By combining various web- and community service, new features can be published.

The solution is enabled by combining on-board technologies, namely (electronic) compass and motion sensor, as well as positioning technologies. The positioning technology may be based on combining this information with the speed of the movement in order to calculate the flight-path.

Various embodiments and possible uses for the invention have been described above, but it will be appreciated by a person of skill in the art that various modifications may be made to the above-described embodiments without departing from the scope of the invention as defined by the appended claims.

**CLAIMS:**

1. A server for use in a wireless communications network, the server comprising:

a receiver for receiving from a communication device information usable to identify a geographical region relative to a geographical location and an orientation of the communication device;

a presence function for determining the presence of an entity associated with another communication device, the entity being located in the identified geographical region;

a transmitter for performing a step selected from one of sending a message to the other communication device, and sending an address associated with the other communication device to the communication device.

2. The server according to claim 1, further comprising a geographical region determination function for determining a geographical region using a received geographical location and orientation the communication device.

3. The server according to claim 1 or 2, wherein the receiver is arranged to receive a message from the communication device, and the transmitter is arranged to forward the message to the other communication device.

4. A mobile communication device for use in a wireless telecommunications network, the mobile communication device comprising:

a message generating function for allowing a user of the device to generate a message;

a geographical location function arranged to determine a geographical location of the communication device;

an orientation determination function arranged to determine an orientation of the communication device;

a transmitter arranged to send the message to a further communication device associated with an entity located in a geographical region determined using the determined geographical location and orientation.

5. The mobile communication device according to claim 4, further comprising a motion detection function for detecting a motion of the wireless communication device

in the direction of the geographical location of an entity associated with the other communication device, wherein the transmitter is arranged to send the message as a consequence of the motion.

6. The mobile communication device according to claim 4 or 5, wherein the transmitter is arranged to send the determined geographical location and orientation to a remote server.

7. The mobile communication device according to any one of claims 4, 5 or 6, wherein the transmitter is arranged to send the generated message to the remote server for forwarding by the remote server to the further communication device.

8. The mobile communication device according to claim any of claims 4, 5 or 6, further comprising a receiver for receiving from the remote server an address of the further communication device, the transmitter being further arranged to send the generated message to the further communication device using the received address.

9. The mobile communication device according to claim 4, further comprising a geographical region module arranged to determine the geographical region relative to the geographical location and direction of orientation, wherein the transmitter is further arranged to send the determined geographical region to a remote server.

10. A method of transferring a message from a wireless communication device to another communication device, the method comprising:

the wireless communication device generating a message;

the wireless communication device determining a geographical location and an orientation of the wireless communication device;

determining a geographical region using the geographical location and orientation;

determining the presence of an entity in the selected region, the entity being associated with the other communication device;

transferring the message to the other communication device.

11. The method according to claim 10, further comprising:

detecting a motion of the wireless communication device in the direction of the geographical location of an entity associated with the other communication device;

as a consequence of the motion, transferring the message to the other communication device.

12. The method according to claim 11, wherein a distance between the geographical region and the wireless communication device is determined by the velocity of the motion.

13. The method according to claim 10, 11 or 12, wherein the entity associated with the other communication device is the other communication device.

14. The method according to any one of claims 10 to 13, wherein the steps of selecting a geographical region in the direction of orientation and determining the presence of the entity associated with the other communication in the selected region are performed at a remote server.

15. The method according to claim 14, wherein the remote server performs a step selected from one of forwarding the message to the other communication device, and sending an address of the other communication device to the communication device, thereby allowing the communication device to send the message to the other communication device.

16. A computer program, comprising computer readable code means which, when run on a mobile communication device, causes the mobile communication device to behave as a communication device as claimed in any one of claims 4 to 9.

17. A computer program, comprising computer readable code means which, when run on a server, causes the server to behave as a server as claimed in any one of claims 1, 2 or 3.

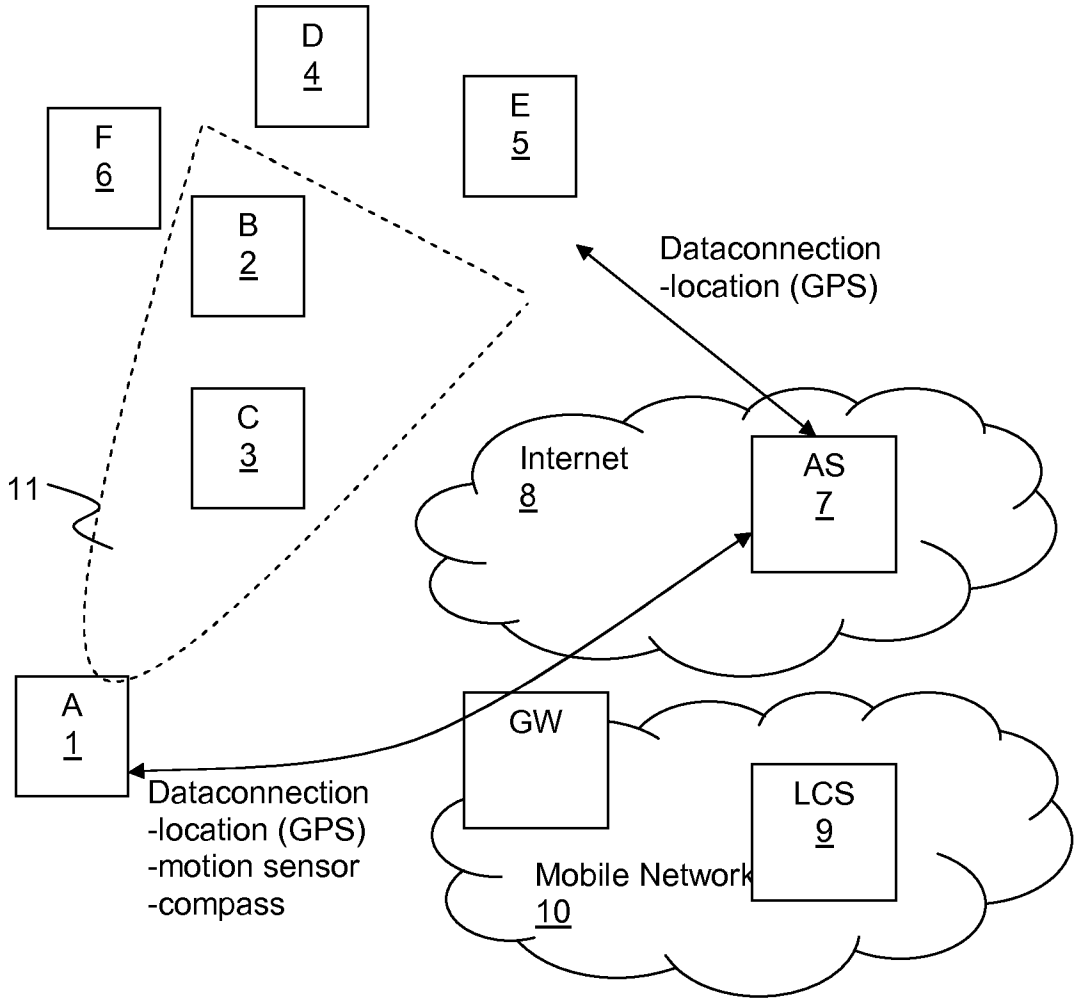

D
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B
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C
3
11
Dataconnection
-location (GPS)
Internet
8
AS
7
A
1
GW
LCS
9
Dataconnection
-location (GPS)
-motion sensor
-compass
Mobile Network
10

Figure 1

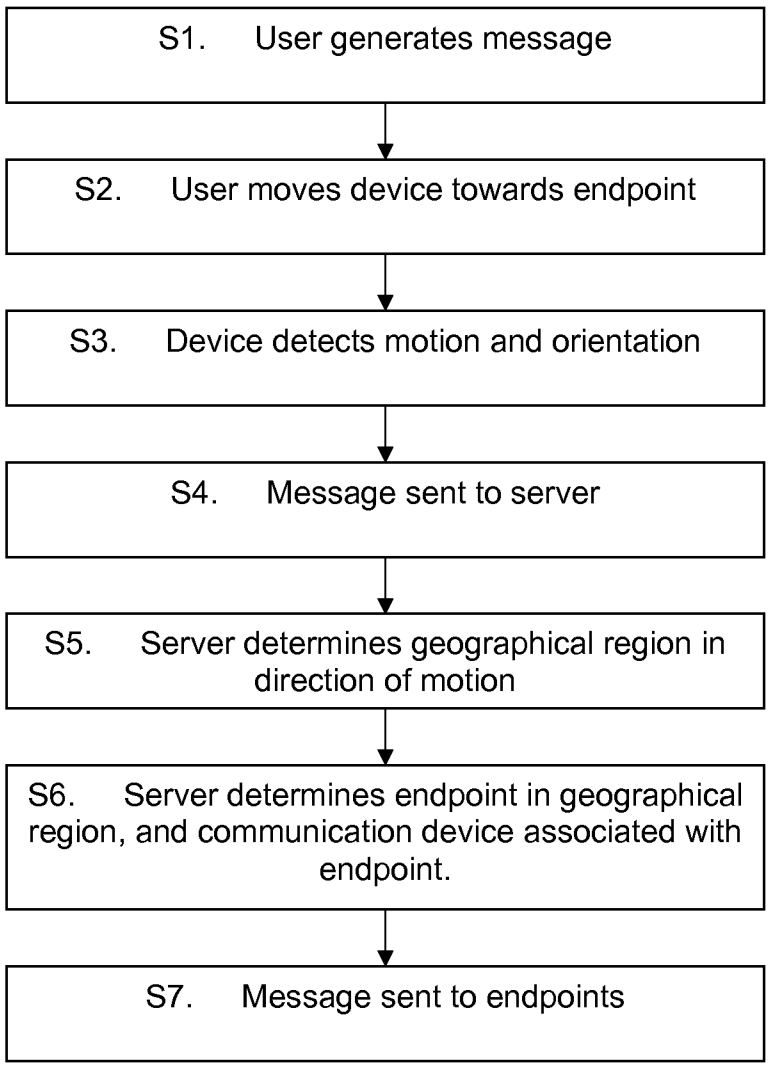

S1. User generates message
S2. User moves device towards endpoint
S3. Device detects motion and orientation
S4. Message sent to server
S5. Server determines geographical region in direction of motion
S6. Server determines endpoint in geographical region, and communication device associated with endpoint.
S7. Message sent to endpoints

Figure 2

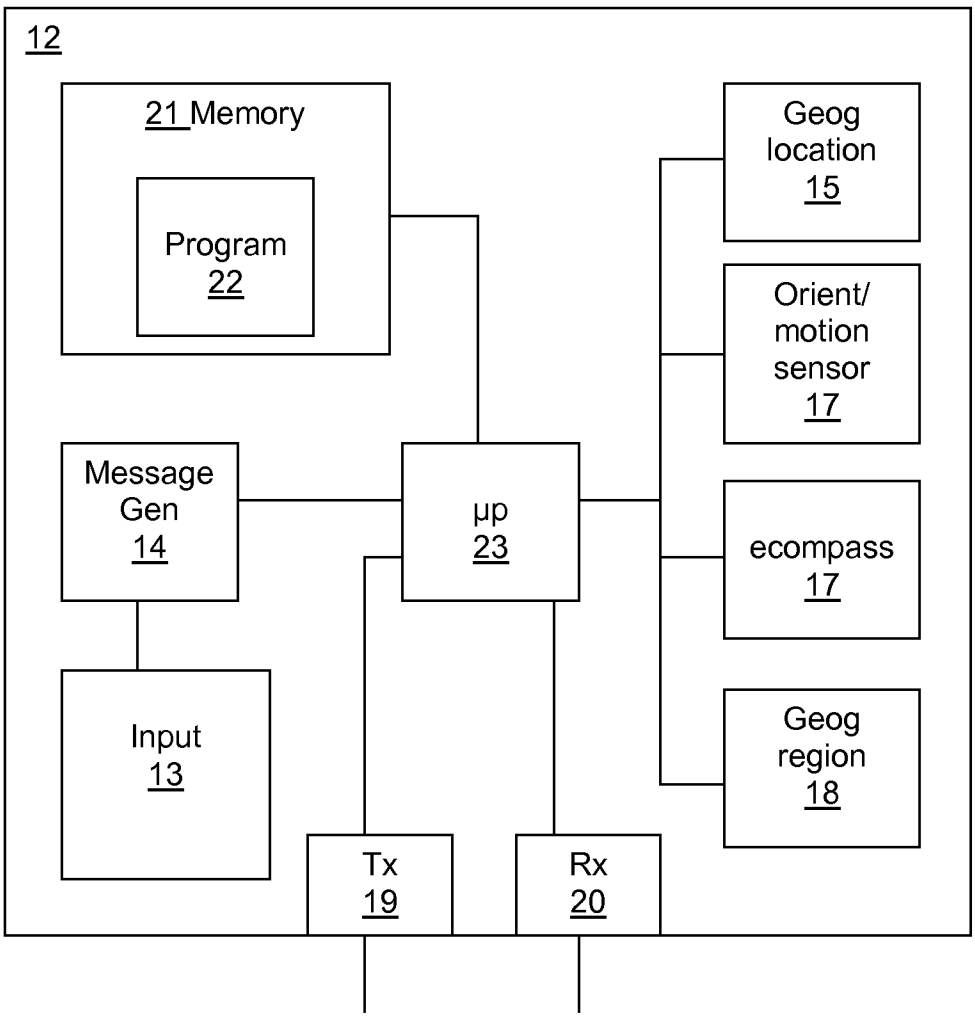

12
21 Memory
Program
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Orient/
motion
sensor
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Message
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23
ecompass
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18
Tx
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Rx
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Figure 3

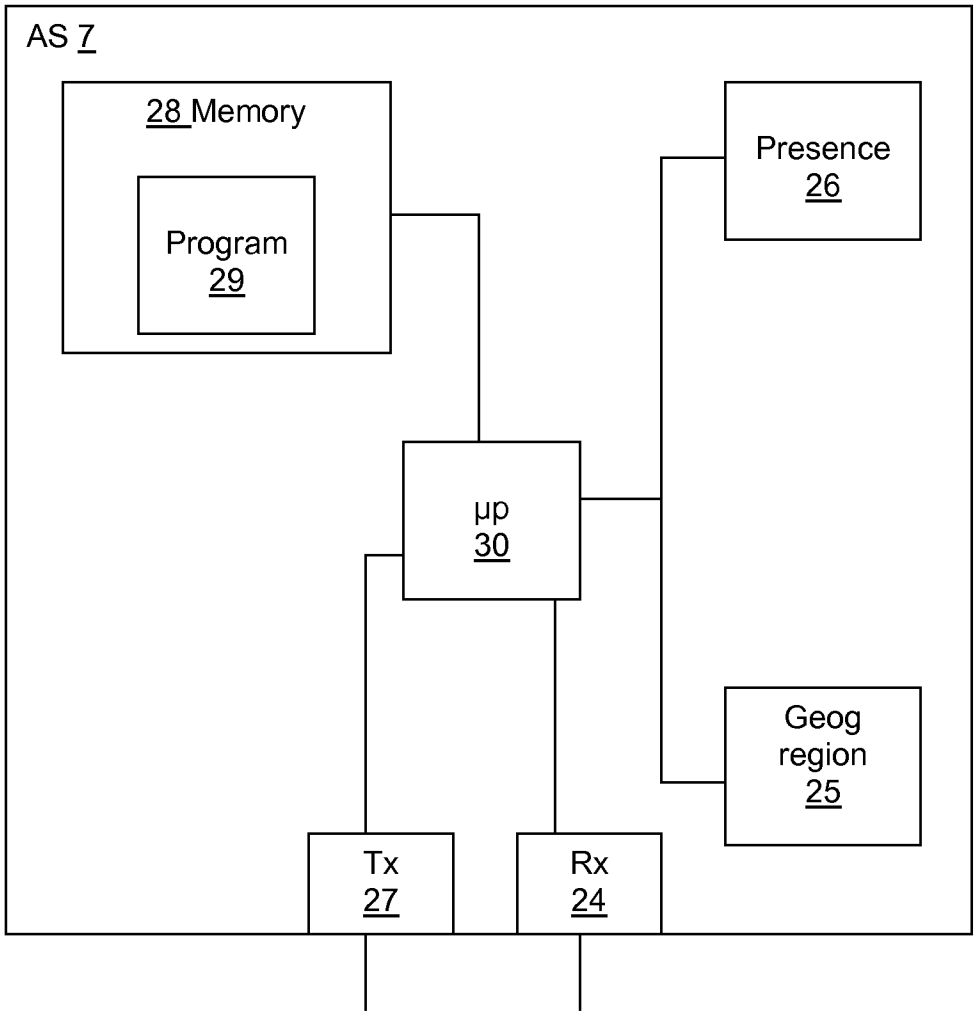

AS 7
28 Memory
Program
29
Presence
26
µp
30
Geog
region
25
Tx
27
Rx
24

Figure 4

# INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2009/065968

**A. CLASSIFICATION OF SUBJECT MATTER**
INV. H04L29/08

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)
H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | Gaurav Singh: "Bump uses the iPhone or iPod Touch's accelerometer" Ub News<br><br>26 April 2009 (2009-04-26), pages 1-3, XP002567464<br>Retrieved from the Internet:<br>URL:http://ub-news.com/news/bump-uses-the-iphone-or-ipod-touch-accelerometer/2196.html><br>[retrieved on 2010-02-08]<br>the whole document | 1-17 |

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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| 9 February 2010 | 17/02/2010 |

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