LOCATION SENSITIVE WIRELESS INFORMATION DISTRIBUTION

A wireless communications network (2) including a fixed master communication device (4) capable of initiating an action or requesting a service on the wireless communication network and a mobile slave communication device (6) to wirelessly communicate with the master communication device. The slave communication device (6) registers with the master communication device (4) to determine a location of the slave communication device and the slave communication device automatically downloads a location-specific portal corresponding to the location of the slave communication device from the master communication device (40-50). Further, communication controls of the slave communication device can be set according to the specific location by referring to a location distribution profile server (27) when the location of the device is determined (52-62).
Published:
— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.
LOCATION SENSITIVE WIRELESS INFORMATION DISTRIBUTION

Technical Field

The present invention relates to short-range communication systems that recognize a device location and more particularly, such systems that exchange communication information in accordance with a location distribution profile corresponding to the location of the device.

Background Art

Personal wireless devices promise to become a necessary companion to keep users connected to their work or family when they are away from the wired world. Their usefulness can be inhibited by annoyances caused by undesired intrusions of unexpected incoming information at times and places where it is not convenient or desirable. Many users turn their devices off to prevent unwanted intrusions, which defeats the purpose of having a personal device. At other times, users are not able to access or receive information because of their location. Existing methods to allow users to filter information which is sent to them must be changed manually by a user-initiated request and there was no way to change the settings automatically. Thus, it is desirable to be able to determine a present location of the wireless device and to match the location information with a profile previously stored which determines how the user of the device wants to be interacted with in that specific location.

In addition, with the increasing number of mobile wireless communication devices, going to a fixed portal is not as valuable as in the days when most computing devices were fixed. Therefore, it is desirable to provide a method to make the portal location-specific. In other words, it is desirable to automatically download a venue specific portal based on the location of the wireless device.

Brief Description of Drawings

The features of the present invention that are believed to be novel are set forth with particularity in the appended claims. However, the invention together with
further advantages thereof, may be best understood by reference to the accompanying drawings wherein:

FIG. 1 is a diagram of a wireless network including a master communication device and at least one slave communication device according to an embodiment of the present invention.

FIG. 2 is a diagram of the master communication device suitable for use in FIG. 1.

FIG. 3 is a diagram of the slave communication device suitable for use in FIG. 1.

FIG. 4 is a flow chart showing a process by which a location-specific portal is downloaded according to an embodiment of the present invention.

FIG. 5 is a diagram showing a process to set communication controls of a wireless communication device in accordance with a stored location distribution profile according to an embodiment of the present invention.

 Disclosure of Invention

FIG. 1 is a diagram of a wireless network including a master communication device and at least one slave communication device according to an embodiment of the present invention. Referring to FIG. 1, wireless network 2 is preferably an ad hoc network such as Bluetooth. Within wireless network 2, there is a master communication device 4, which is preferably capable of initiating an action or requesting a service on wireless network 2. Master communication device 4 controls communications between itself and slave communication devices 6. Each slave communication device 6 is capable of communicating with both master communication device 4 and another slave communication device 6 through master communication device 4. While only one master communication device is shown in FIG. 1, it should be understood that wireless network 2 could include many master communication devices and corresponding slave communication devices, as provided for by the Bluetooth network protocol.

Master communication device 4 and slave communication devices 6 are preferably short-range wireless communication devices, such as personal digital assistants, cellular phones, digital wallets, etc. Master communication device 4 and slave communication devices 6 need not necessarily be the same type of device,
i.e., personal digital assistants, as long as they are all Bluetooth enabled devices. Thus, wireless network 2 is essentially a cooperative engagement of a collection of mobile nodes without any intervention of a centralized access point or existing infrastructure. The lengths of the network are dynamic and are based on the proximity of one node to another node, i.e., master communication device 4 to slave communication devices 6.

FIG. 2 is a diagram of the master communication device as shown in FIG. 1. Referring to FIG. 2, master communication device 4 is preferably a short-range wireless device, as stated above, and may include a receiver 10, a processor 12, a memory 14, a transmitter 16, an input unit 18 and a display 19, inter-coupled as shown. In addition, master communication device 4 preferably includes a battery (not shown) to supply power thereto.

FIG. 3 is a diagram of the slave communication device as shown in FIG. 1. Referring to FIG. 3, slave communication device 6 is essentially similar to master communication device 4 with additional elements illustrated herein for the purpose of explanation of the preferred embodiment. Specifically, slave communication device 6 preferably includes a receiver 20, a processor 22, a memory 24, a transmitter 26, a location distribution profile server 27, an input unit 28, an antenna 29 and a display 30, inter-coupled as shown. Again, slave communication device 6 preferably includes a battery (not shown) to supply power thereto.

It will be understood that the operation and functionality of the master and slave devices are largely established or controlled by software programs being executed by one or more processors such as processor 12 or 13. Such software is not further discussed herein in the interest of avoiding unnecessarily obscuring the invention. However, development thereof, however lengthy, would be well within the group of one of ordinary skill given the teachings of the present invention.

As stated above, wireless network 2 may include a plurality of slave communication devices 6. A user of slave communication device 6 typically stores location distribution profiles corresponding to user defined locations, such as, the mall, the user’s office, the user’s home, a meeting room, etc. In location distribution profile server 27, this information is preferably input via the input unit 28. Input unit 28 could be a keypad, for example. Each location distribution profile defines communication controls of the communication device in accordance with the user’s instructions. For example, when the user is in his or her automobile, all transactions
will be conducted via voice, for example. Thus, freeing up the user’s hands to control the automobile. Thus, when slave communication device 6 is in the user’s automobile, for example, and registers with master communication device 6, also located in the automobile, slave communication device 6 typically registers with master communication device 4, whereby the location of the slave communication device is determined through this process. Alternatively, master communication device 4 can register slave communication device 6 and transmit location information to slave communication device 6. This operation is described in detail with reference to FIG. 5.

Although the location distribution profile server is shown as being located within the slave communication device, it is possible that the location distribution profile server is located within a master device or within a web server, which can be accessed by the master device. Essentially, the location distribution profile server is a central controller for determining how a user is to be communicated with depending on where, as determined by network location, the user is currently connected. It is not necessary that the server be located on network 2, for example, as long as there is a way to access the information stored therein.

As another example, the master device could access the slave device’s home network, which is accessible via many other networks via an inter-network connection.

FIG. 4 is a flow chart showing a process by which a location-specific portal is downloaded and displayed by a slave communication device according to an embodiment of the present invention. Referring to FIG. 4, in operation 40, master communication device 4 scans to locate a compatible device, i.e., slave communication device 6. Alternatively, slave communication device 6 scans to locate a compatible master, i.e., master communication device 4. This can be accomplished in both devices by using the respective processors, receivers, transmitters, etc. Such communication methods are well known in the art, for example, Bluetooth methods, and therefore, a detailed description of their operation is omitted here.

From operation 40, the process moves to operation 42, where it is determined whether a compatible device has been located. Again, the method of determining whether a compatible device has been located is well known in the art and, thus, a description thereof will be omitted here.
If in operation 42 a compatible device is not located, the process moves from operation 42 back to operation 40, where scanning is again done to locate a compatible device.

If a compatible device is located in operation 42, the process moves to operation 44, where master communication device 4 registers with slave communication device 6 (or slave communication device 6 registers with master communication device 4, as the case may be). Such registration is done within the standards of the Bluetooth technology, which is well known in the art.

From operation 44, the process moves to operation 46, where master communication device 4 determines the location of slave communication device 6 from registration information obtained in operation 44 or other information available to the master device. Essentially, if master communication device 4 is a fixed device, this location information is easily available, perhaps as preprogrammed information, and will typically be transmitted from master communication device 4 to slave communication device 6.

From operation 46, the process moves to operation 48, where master communication device 4 transmits a location-specific portal to slave communication device 6. For example, if master communication device 4 is located within the lobby of a specific hotel, master communication device 4 will transmit a location-specific portal relating to the lobby of that hotel, for example. Such a portal could possibly be designed to provide for quick and easy guest registration or check out.

From operation 48, the process moves to operation 50, where slave communication device 6, if desired, displays, via display 30, a web page corresponding to the location-specific portal.

FIG. 5 is a diagram showing a process by which communication controls of a wireless communication device are set in accordance with a stored location distribution profile according to an embodiment of the present invention. Referring to FIG. 5, in operation 52, the slave communication device registers with the master communication device. However, as stated in conjunction with the description of FIG. 4, it is possible that the master communication device will register the slave communication device when the slave communication device is detected by the master communication device.

From operation 52, the process moves to operation 54, where master communication device 4 transmits location information to the slave communication.
device. According to this embodiment, master communication device 4 is a fixed device and, thus, the location information will not change. However, the present invention is not limited to a fixed master communication device. For example, if the master device is equipped with or otherwise has access to a GPS receiver, the location information can be updated routinely even if it is changing.

From operation 54, the process moves to operation 56, where it is determined whether the location information matches a stored location in the location distribution profile server. If the location information does not match a location previously stored in the location distribution profile server, the process moves to operation 58, where communication controls of the slave communication device are set according to a default setting. The default setting can be set according to the user's wishes and manually adjusted thereafter.

If the location information matches a location stored in the location distribution profile server, the process moves to operation 60, where the slave communication device retrieves a profile from the location distribution profile server corresponding to the location of the device.

From operation 60, the process moves to operation 62, where communication controls of the slave communication device are set in accordance with the profile stored in a location distribution profile which corresponds to the location of the slave communication device, which is determined in operation 54. Thus, according to this embodiment, for example, if the slave communication device is in an automobile, and this location is identified by the master communication device and transmitted to the slave communication device, the slave communication device can set the communication controls of the slave communication device in accordance with the pre-specified controls for an automobile, which are previously stored in the location distribution profile server.

Thus, according to the above described embodiments, determining the location of the wireless communication device, i.e., the slave communication device, allows a location-specific portal to be downloaded to the device and also allows the device to automatically set its communication controls in accordance with that particular location.

According to another embodiment of the present invention, if slave communication device 6 moves outside of the communication range of master communication device 4 (or network 2), it is preferable that the display of the slave
communication device will automatically display at least one default web page. In other words, if the location-specific portal is no longer applicable to the location of the wireless communication device, there is provided a method to display a default web page. It should be understood that when slave communication device 6 moves out of range, it either enters another network or is transferred to a wide area network, perhaps. Then, a default web page would preferably be downloaded and then displayed by slave communication device 6. This can be accomplished according to well known methods for sending web pages to wireless communication devices, such as described by the Wireless Access Protocol literature.

In addition to downloading a default web page, the slave communication device 6 can be changed in terms of its operation parameters when it enters a new location, for example, when in a meeting room.

Further, the slave communication device could transmit cookies, i.e., a set of stored preferences, to the master communication device. Thus, the location-specific portal could be personalized to the user of the slave communication device based on the cookies transmitted from the slave communication device to the master communication device.

It will be apparent to those skilled in the art that the disclosed invention may be modified in numerous ways and may assume many embodiments other than the preferred forms specifically set out and described above. Accordingly, it is intended by the appended claims to cover all modifications of the invention, which fall within the true spirit and scope of the invention.
What is claimed is:

1. A wireless communication device, characterized by:

   a processor to determine a location of the wireless communication device through registration with a fixed master communication device; and

   a receiver to automatically download a location-specific portal corresponding to the location of the wireless communication device.

2. The device as claimed in claim 1, wherein the wireless communication device is a mobile device.

3. The device as claimed in claim 1, further characterized by a display to display a web page corresponding to the location-specific portal.

4. The device as claimed in claim 3, wherein the display automatically displays at least one default web page if the wireless communication device moves outside of a communication range of the master communication device.

5. The device as claimed in claim 1, further characterized by a transmitter to transmit cookies to the master communication device, wherein the receiver automatically downloads a personalized location-specific portal corresponding to the cookie and the location of the wireless communication device.

6. The device as claimed in claim 1, further characterized by a location distribution profile server storing location distribution profiles for a user of the wireless communication device, wherein incoming information is received according to the location distribution profile corresponding to the location of the wireless communication device.
7. The device as claimed in claim 1, wherein incoming information is received by the receiver according to location distribution profiles stored in a location distribution profile server.

8. The device as claimed in claim 1, wherein communication controls of the wireless communication device are set in accordance with the location of the wireless communication device.

9. The device as claimed in claim 6, wherein requests from the wireless communication device to the master communication device are handled in accordance with the location distribution profile corresponding to the location of the wireless communication device.

10. A wireless communications network characterized by:

   a fixed master communication device capable of initiating an action or requesting a service on the wireless communication network; and

   a mobile slave communication device to wirelessly communicate with the master communication device, wherein the slave communication device registers with the master communication device to determine a location of the slave communication device and the slave communication device automatically downloads a location-specific portal corresponding to the location of the slave communication device from the master communication device.

11. The wireless communications network as claimed in claim 10, wherein the master communication device registers the slave communication device to determine the location of the slave communication device.

12. The wireless communications network as claimed in claim 10, wherein the master communication device automatically downloads a location-specific portal corresponding to the location of the slave communication device to the slave communication device.
13. A master communication device characterized by:

a receiver to receive a communication from a wireless communication device within a communication range of the master communication device; and

a transmitter to automatically transmit a location-specific portal, corresponding to a location of the wireless communication device, to the wireless communication device.

14. The master communication device as claimed in claim 13, wherein the transmitter transmits a registration signal to the wireless communication device to determine the location of the wireless communication device prior to receiving a communication from the wireless communication device.

15. A method of automatically downloading a location-specific portal from a fixed master communication device to a mobile slave communication device in a wireless communications network, characterized by:

registering the mobile slave communication device with the fixed master communication device;

determining a location of the mobile slave communication device from registration information received at the fixed communication device; and

automatically transmitting a location-specific portal corresponding to the location of the mobile slave communication device from the fixed communication device to the mobile slave communication device.
FIG. 1

FIG. 2
FIG. 3
MASTER DEVICE SCAN TO LOCATE A COMPATIBLE DEVICE OR SLAVE DEVICE
SCANS TO LOCATE A COMPATIBLE MASTER

IS COMPATIBLE DEVICE LOCATED?

NO

YES

MASTER DEVICE REGISTERS WITH SLAVE DEVICE OR SLAVE DEVICE REGISTERS WITH MASTER DEVICE

MASTER DEVICE DETERMINES LOCATION OF SLAVE DEVICE FROM REGISTRATION INFORMATION

MASTER DEVICE TRANSMITS LOCATION-SPECIFIC PORTAL TO SLAVE DEVICE

SLAVE DEVICE DISPLAYS WEB PAGE CORRESPONDING TO LOCATION-SPECIFIC PORTAL

FIG. 4
4/4

WIRELESS COMMUNICATION DEVICE REGISTERS WITH MASTER DEVICE 52

MASTER DEVICE TRANSMITS LOCATION INFORMATION TO WIRELESS COMMUNICATION DEVICE 54

DOES LOCATION INFORMATION MATCH LOCATION STORED IN LOCATION DISTRIBUTION PROFILE SERVER ?

56

YES

RETRIEVE PROFILE CORRESPONDING TO LOCATION INFORMATION 60

SET COMMUNICATION CONTROLS TO DEFAULT SETTING 58

NO

SET COMMUNICATION CONTROLS OF WIRELESS COMMUNICATION DEVICE IN ACCORDANCE WITH PROFILE 62

FIG. 5
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
   IPC(7) : H04Q 7/20; H04M 11/10, 5/42 G01C 21/00; G06F 15/16
   US CL : 465/456, 414, 418; 701/307; 709/308
   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)

   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 practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>US 6,014,090 A (ROSEN et al) 11 January 2000, col col 3 line 40-41, col 5 line 27</td>
<td>1-15</td>
</tr>
<tr>
<td>A</td>
<td>US 5,613,213 A (NADDELL et al) 18 March 1997, col 1 line 65-col 2 line 23</td>
<td>1-15</td>
</tr>
</tbody>
</table>

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

Date of the actual completion of the international search
07 DECEMBER 2001

Date of mailing of the international search report
09 JAN 2002

Name and mailing address of the ISA/US Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Authorized officer
CHARLES R CRAVER

Telephone No. (703) 505-8905

Form PCT/ISA/210 (second sheet) (July 1998)