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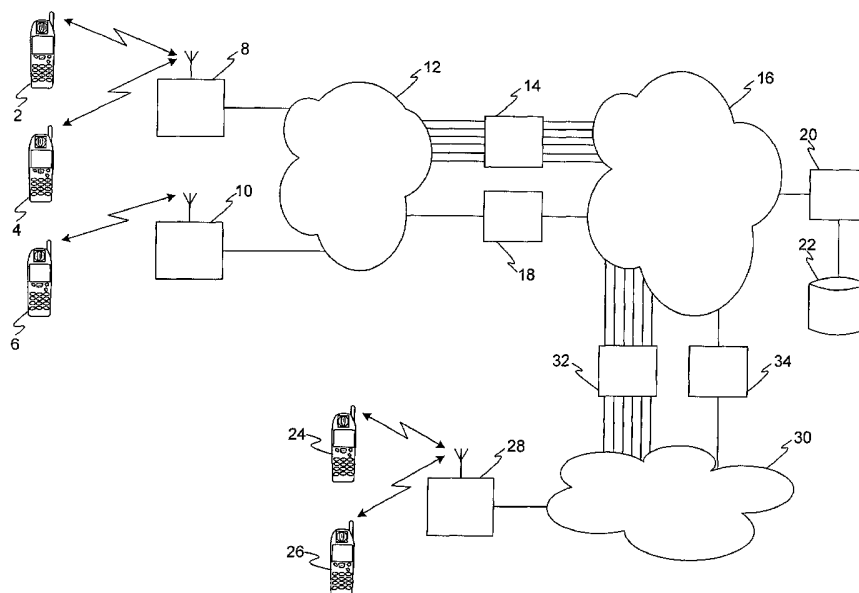
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(54) Title: DATA COMMUNICATION SYSTEM



(57) Abstract: A method for enabling the communication of messages comprising images to a recipient specified by a sender operating a mobile communications device, said method comprising: obtaining the location of a sender's mobile communications device, said location having been derived by a process in which the location of the sender's mobile communications device is automatically sensed; using said obtained location, searching a geocoded database comprising photographic images which relate to predetermined geographic locations or areas; retrieving data relating to one or more of said photographic images and transmitting same to the sender's mobile communications device.



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### **Data Communications System**

This invention relates to a data communications system, in particular, but not exclusively, a data processing system comprising mobile communications devices enabled for communication with service nodes in a telecommunications network.

A known type of electronic message communicated by senders to recipients is referred to as an eCard. Typically, an eCard sender visits the Website of an eCard supplier, selects a photographic image from an image database, inputs a message and a recipient e-mail address. The eCard supplier then transmits an e-mail message to the recipient, containing a Web link Uniform Resource Locator (URL) along with a unique code to be input to retrieve the eCard, or a Web link URL itself containing the card's unique code. The eCard itself is typically in the form of a single hypertext mark-up language (HTML) page containing both the selected photographic image and the message text.

Another type of electronic message communicated by senders to recipients is an option given on some Web sites to e-mail content on the currently-displayed page to a friend. The content may for example be a news story which the sender considers may be of interest to a friend. The story is formatted as an e-mail message, or the appropriate Web link is placed in an e-mail message, and the message is sent to the recipient specified by the sender. In some cases, an option is given to allow the sender to add text. This type of message differs from an eCard in that the original content is not arranged primarily for the purpose of transmission to the recipient using an e-mail message, but its transmission to the recipient is a secondary possibility following the viewing of the content by the sender. On the other hand, in the case of an eCard the original content is intended primarily for the purpose of the construction of a message for transmission to the recipient. In the case of an eCard service the original content includes a set of consistently formatted images, which are browsable by the sender before a particular image is chosen for transmission to the recipient.

Mobile telephone handsets and other wireless devices are known which have location-awareness. Mobile radio networks are known which allow accurate location sensing for handsets active in the network. The location sensing may be handset-based (for example via a global positioning system (GPS) receiver integrated or associated with the handset), network-based (for example the Cursor™ system developed by Cambridge Positioning Systems or a Cell ID method), or both (for example network-assisted GPS). A network-based entity, referred to herein as a “location server” which provides current (or most-recent) handset locations to authorised third parties. In the case of handset-based positioning the handsets may intermittently, or on request, report the handset position to the location server, to allow the network knowledge of the handset’s location, thereby enabling for example location-based push technology.

Aspects of the invention are set out in the appended claims.

The images sent as eCards in the present invention preferably comprise photographic images, such that messages representing electronic postcards may be constructed and transmitted. The image preferably comprise images of real buildings, geographical features, etc. which are in the vernacular of the place from which the sender initiates the generation of the message transmitted to the recipient.

Features and advantages of the different aspects of the present invention will be apparent from the following description of preferred embodiments of the invention, made with reference to the accompanying drawings, in which:

Fig. 1 is a schematic illustration of a mobile communications system in accordance with an embodiment of the invention;

Fig. 2 is a schematic illustration of a mobile terminal in accordance with an embodiment of the invention;

Fig. 3 is a flow diagram illustrating steps carried out using a mobile terminal in accordance with an embodiment of the invention;

Fig. 4 is a flow diagram illustrating steps carried out at an eCard server in accordance with an embodiment of the present invention;

Figs. 5 to 7 illustrate graphical user interface configurations during eCard composition procedures in accordance with embodiments of the invention; and

5 Fig. 8 illustrates an eCard created in accordance with an embodiment of the invention.

Figure 1 schematically illustrates one embodiment of the invention in which user terminals are in the form of cellular radio communications devices with network access to various service resources and other user terminals. The devices have voice and data communications capability, and are capable of  
10 browsing hypermedia content in the form of Web pages, WAP (Wireless Application Protocol, as defined by the WAP Forum) decks and I-mode (as promoted by NTT Docomo of Japan) content. Examples of such devices are smartphones, which combine the features of a handheld computing device and cellular telephone, and a PDA/cellular telephone combination.

15 As shown in Figure 1, exemplary mobile terminals 2, 4, 6 are able to conduct cellular radio communications via radio base stations 8, 10, which form part of a known public cellular radio network 12. The cellular network 12 may for example be a GSM cellular network, or a third generation cellular network such as a UMTS network. In any case, terminals 2, 4, 6 have access to  
20 a public data communications network 16, such as the Internet, via packet data communications gateway 14, which may for example take the form of a Wireless Application Protocol (WAP) gateway, a General Packet Radio Service (GPRS) gateway, an I-mode gateway, etc.

Each mobile terminal 2, 4, 6 is able to sense its geographical location  
25 with an internal or co-located positioning module such as a GPS receiver or on-board triangulation-based location calculation equipment. Alternatively, mobile network 12 is able to sense the location of a mobile terminal using cell registration or triangulation methods such as those described above. Further alternatively, a hybrid positioning technology may be used wherein the mobile  
30 handset and mobile network cooperate to sense the location of the mobile terminal. The sensed location data is made available via location server 18. Service provision nodes are capable of obtaining the geographic location of a

mobile terminal from location server 18 by providing the server 18 with a suitable identifier for the terminal, such as its directory number or an allotted IP address. Alternatively, location data may be requested and provided to mobile device 14 via other signalling channels available in mobile network 26.

5           Location server 18 is capable of taking a mobile terminal identity received in a service request, for example an HTTP GET request, and transmitting an HTTP response containing the requested location data. The request/response format may for example be that used in the Ericsson Mobile Positioning Protocol (MPP). When a mobile terminal registers with eCard  
10 server 20, the eCard server may obtain geographical location data, preferably in the form of global location identifying coordinates (e.g. latitude and longitude coordinates) by transmitting such a request to the positioning server 18.

In alternative embodiments, the location of a mobile terminal may be  
15 sensed via a different interface, for example by receiving call ID information from the mobile terminal itself, for example via Short Message Service (SMS) messages, Multimedia Messaging Service (MMS) messages, or by signalling during a call involving the mobile terminal. In these cases, the registration procedure includes for example the transmission of an SMS or MMS message  
20 to the eCard server 20 or a voice call to the eCard server from the mobile station in question.

Mobile terminals 2, 4, 6 may access content and services available at eCard server 20 by using suitable hypermedia browser software applications. For example, eCard server 20 may include Web, MMS, I-mode and/or WAP  
25 servers and user terminals 2, 4, 6 may run Web browser, MMS presentation, I-mode browser or WAP micro-browser terminal application programs.

Connected to eCard server 20 is a geocoded photographic image library database 22, where from users may select digital photographic images to be sent in eCards to be sent to selected recipients. Each image is databased under  
30 specified location coordinates, for example longitude and latitude coordinates, indicating the location(s) with which the image is associated. In the case of a photograph of a particular location, such as a particular building or other

geographical feature, the location coordinates are preferably in the form of location coordinates defining a point corresponding to the location of the feature. In the case of a photograph of an image which relates to a particular area, for example wildlife or other images exemplary of a particular region the geocoding is in the form of location coordinates or other geographical indicators (for example a city name) which define the relevant geographical area.

Figure 1 also illustrates, for exemplary purposes, mobile terminals 24, 26, receiving cellular radio communications access via basestation 28 from a second mobile communications network 30. Mobile communications network 30 includes a gateway server 32 providing access to the eCard server 20 and via public data communications network 16. Mobile communications network 30 includes a location server 34, operating in the same way as location server 18 as described above, whereby eCard server 20 may be informed of the location of a mobile terminal 24, 26 operating within mobile communications network 30. In this way, users of mobile terminals receiving service via different mobile communications networks may each transmit eCards using the eCard server 20. The eCard server 20 is registered as an authorised location client of each location server of each mobile network of which subscribers are able to use the service provided by the eCards server.

Figure 2 schematically illustrates external features of a mobile station 2. The mobile station includes a radio communications antenna 50, a touch screen 52 for displaying and interacting with hypermedia content, a text input pad 54 for inputting text in the form of a touch screen keyboard or a handwriting recognition pad, and a plurality of operational keys 56.

Figure 3 is a flow diagram illustrating steps carried out at a mobile terminal 2 in the process of sending an eCard to a selected recipient. In step 100, the user registers with the service. In this embodiment, the sender uses the hypermedia browser on terminal 2 to access a predetermined hypermedia site, for example "www.spotcard.com". If the sender has not previously registered with the service, the sender selects a registration option and fills in an on-line form giving personal details, including a user name and password,

used by the site to ensure privacy of the locational information which is used to obtain eCards according to the present invention, which are related to the current location of the sender. The user also provides the identity of their mobile communications network operator, whereby the appropriate location server is identified, and their mobile subscriber international service directory number (MSISDN), whereby the appropriate mobile terminal is identified by the location server. If the sender has previously registered, the user may log on to utilise previously stored personal information, for example by means of their user name and password and/or by means of a cookie message sent from the mobile terminal identifying the user.

Once logged on, the sender initiates an eCard search by clicking on a given option on the homepage of the eCard service site, step 102. In response, the site transmits a position request message to the appropriate location server 18. If using the Ericsson MPP, the request is sent as an appropriately formatted http POST request, including various parameters relating to the position request including the client ID of the eCard service, the client password, the mobile station MSISDN, the coordinate system in which the answer is to be prepared, a quality of service (QoS) parameter, and a maximum delay accepted by the service between the sending of the request and the receipt of the response. Further details of the request format can be obtained from the protocol documentation: Mobile Positioning Protocol, V3.0, Ericsson, 2001, incorporated herein.

If the sender has made the appropriate privacy settings with their network operator, the location server will transmit a response containing location coordinates, for example longitude latitude coordinates, as most recently obtained for the specified mobile terminal. The method by which the location coordinates are obtained is one of the above-described methods in which the location of the mobile station is sensed, either handset based, network-based or both. If the appropriate privacy settings are not currently active, the service returns a message to the mobile station indicating that positioning is not possible, that the user must make the appropriate authorisation settings with their mobile network operator, and allowing the

sender the option to specify their location by other means, for example by entering the name of a city, street name, postcode, etc.

In the conduct of the search, further interaction with the sender may occur. Figure 5 illustrates an input screen showing different image category selections which the sender may select between. The images in the geocoded database are also coded by category, in this exemplified embodiment “Local Sights”, “Local Wildlife” and “Local Food”.

Following completion of the search, the user is presented with a hypermedia page or card showing a selection of one or more local images from which to choose. An example is illustrated in Figure 6, in which the sender is presented with the names of three selectable local sights, represented in the geocoded database by location coordinates defining points, presented as hyperlinks 302, along with an indication of the distance between the sender’s current location, as sensed during the mobile terminal positioning procedure, and the stored location coordinates for each image in turn. As illustrated, the image names are sorted by distance from the current location, with the most proximate sight at the top of the list. Figure 7 illustrates a further example hypermedia page or card showing a different selection of one or more local images from which to choose. In this example, the sender is presented with the names of three selectable local wildlife images, represented in the geocoded database by location coordinates defining regions, presented as hyperlinks 304, along with an indication of the region for which the image is applicable, and in which the sender’s current location, as sensed during the mobile terminal positioning procedure, falls. As illustrated, the areas may include national regions (e.g. UK), sub-national regions (such as a county or district) and metropolitan regions (e.g. London).

In the next step, step 104, the user selects an image by clicking on one of the hyperlinks. In response, the user may be sent a copy of the image in question for perusal before confirming the selection. The image may be sent in full, or, in order to conserve wireless bandwidth, a reduced data file size version, for example a thumbnail version, of the image may be sent. If a



different image is desired, the sender may return to one of the previous selection parts of the procedure to make a different selection.

On selecting an image, the user proceeds by composing a textual message, step 106, inputting a recipient address in the form of an e-mail address or other appropriate address (for example the recipient's MSISDN to  
5 allow the transmission of an SMS message or MMS message), step 108, and confirms by an appropriate hypermedia link selection in step 110 to initiate the sending of the eCard by the eCard server 20.

Figure 4 illustrates steps carried out by the eCard server 20 during the  
10 eCard composition process. On receipt of a request to begin the eCard composition process, in the form of a packet transport protocol request message such as an http request, step 200, the eCard server 20 uses the requesting user's mobile station identifier, in this embodiment the MSISDN, to format a new positioning request, which is transmitted to the Location Server  
15 18 of the mobile network identified in the personal profile of the user, and, providing positioning is possible, a response is received containing location coordinates for the mobile station in question, step 202. If positioning is not possible, a reply is sent to the user to request the input of the user's location in another format, as described above. With the mobile station's location  
20 coordinates, and any image category data the user may have specified in a preceding interaction, the eCard server 20 performs a location-based search of the geocoded database of images, step 204. In this search, a proximity-calculating algorithm is used to identify the images, within the selected category, which represent objects associated with the area in which the current  
25 location of the user falls. Once one or more images have been identified in this way, a hypermedia page or card is transmitted to the user terminal containing identifiers for the one or more identified images, step 206. The identifiers may include names of the places or objects represented in the images, along with the images, or reduced versions thereof. The identifiers are presented in a  
30 selectable manner, such that the user may make a choice by touch-screen or other man-machine interface interaction, which results in the eCard server 20 receiving a message indicating the selection of the user, which is stored, step

208. In response, the eCard server transmits a text input form to allow the user to compose a textual message on their mobile terminal, step 210. The user transmits the filled-in form back to the eCard server, which is stored, step 212. Next, a form is transmitted to the user to allow the input of a recipient address or other identifier, step 214. Finally, the eCard server 20 receives the recipient address or identifier and, preferably following a step in which the eCard server transmits a representation of the entire eCard for approval, the eCard server receives a message confirming that the eCard should be sent, step 216. Following this interaction with the sender, the eCard server transmits a message, for example an e-mail, MMS, WAP, I-mode or SMS message, to the recipient. The message, if an e-mail, MMS, WAP or I-mode message, may contain the eCard as an attachment in the form for example of a Web, MMS, WAP or I-mode message. Otherwise, the message may contain a hyperlink address for the eCard server and a unique transaction ID to allow the recipient to access the eCard, presented as a Web, WAP or I-mode page or card, details of which are stored for a given period on the eCard server 20, by selecting the hyperlink.

Note that during the eCard composition process, a number of steps are carried out in the mobile network of the subscriber, including the steps of sending the location of the mobile station, receiving and transmitting a response to a positioning request from the eCard server, and transmitting all of the messages exchanged between the mobile terminal and the eCard server during the eCard composition process.

Figure 8 illustrates an exemplary eCard format, showing the eCard 400 as a Web, MMS, WAP or I-mode message. The eCard includes the selected image 402, the message text 404 input by the sender, and an identifier for the sender, 406. Other elements may also be included, for example animated content, advertising or other promotional content not selected or specified by the sender, etc. The different elements of the eCard may also be distributed over to or more linked pages or cards.

In embodiments of the invention, the images in the geocoded database preferably include a large number of digitally coded photographs, which may

be substantially unedited or may include photographic features along with otherwise produced graphical features, or the photographs may be somehow edited, for example with the addition of greeting text. Such greeting text may be related to the location(s) to which the image pertains (for example  
5 “Greetings from London”). The images in the geocoded database of images may also include computer-generated images or animations of places and other objects. Preferably the majority of the images are substantially purely photographic images, to provide the most satisfying eCard service, since real photographic images are generally most capable of displaying the  
10 characteristics of a building or other geographical feature which people will wish to communicate to others when using the eCards service. Furthermore, the database preferably comprises a geographical distribution of images which varies such that regions or cities which have a greater number of major tourist sites tend to have more images, being images of those sites, stored than regions  
15 or cities in which have a lesser number of major tourist sites.

The above embodiments are to be understood as illustrative examples of the invention. Further embodiments of the invention are envisaged. For example, the eCard server 20 may be connected to one mobile network only, as a service intended only for the subscribers of that mobile network.  
20 Furthermore, rather than transmitting the eCard directly to the recipient, it may be sent first to the sender, following its composition, for onward transmission to a selected recipient, for example as an e-mail message attachment. In this case, the message text may be added to the eCards after receipt by the sender, and before its onward transmission to the recipient, which may be selected for  
25 example by the sender from an internal contacts directory on the mobile terminal. It is to be understood that any feature described in relation to one embodiment may also be used in other of the embodiments. Furthermore, equivalents and modifications not described above may also be employed without departing from the scope of the invention, which is defined in the  
30 accompanying claims.

**CLAIMS:**

1. A method for enabling the communication of messages comprising images to a recipient specified by a sender operating a mobile communications device, said method comprising:
- 5 obtaining the location of a sender's mobile communications device, said location having been derived by a process in which the location of the sender's mobile communications device is automatically sensed;
- using said obtained location, searching a geocoded database comprising
- 10 data for images representing places or objects which relate to predetermined geographic locations or areas;
- retrieving data relating to one or more of said images and transmitting same to the sender's mobile communications device;
- receiving a selection from the sender specifying a selected image;
- 15 receiving message data from the sender, said message data being intended to accompany the selected image;
- transmitting a message to allow a selected recipient to access said selected image and said message data.
- 20 2. A method according to claim 1, wherein said transmitted message allows access to the image and message data in the form of an eCard.
3. A method according to claim 1 or 2, wherein said geocoded database comprises a geographical distribution of data relating to images which
- 25 varies such that regions or cities which have a greater number of tourist sites tend to have more images stored than regions or cities in which have a lesser number of tourist sites.
4. A method according to any preceding claim, wherein said
- 30 images representing places or objects which occupy predetermined geographic locations, and said geocoded database comprises geographical location indicators identifying said locations.

5. A method according to any preceding claim, wherein said images representing places or objects which relate to predetermined geographic areas, and said geocoded database comprises geographical location indicators  
5 identifying said areas.

6. A method according to claim 5, wherein said areas comprise geo-political regions.

10 7. A method according to claim 6, wherein said regions comprise national regions.

8. A method according to claim 6 or 7, wherein said regions comprise sub-national regions.

15

9. A method according to claim 6, 7 or 8, wherein said regions comprise metropolitan regions.

10. A method according to any preceding claim, wherein said  
20 searching process comprises searching said geocoded database by proximity, based on said obtained location.

11. A method according to any preceding claim, wherein said  
25 searching process comprises searching said geocoded database by determining one or more geographical areas in which said obtained location falls.

12. A method according to any preceding claim, wherein said image comprise photographic images.

30 13. A method according to claim 12, wherein the majority of said images comprise photographic images.

14. A method according to any preceding claim, comprising:  
receiving data identifying a recipient address from the sender; and  
transmitting a message to the recipient address to allow the recipient to  
access said selected image and said message data.

5

15. Apparatus arranged to perform the method of any preceding  
claim.

16. A method of operating a mobile communications device in  
10 order to construct a message intended to be sent to a recipient, said method  
comprising:

transmitting a message to a service node to allow said service node to  
obtain the location of the sender's mobile communications device, said  
location being derived by a process in which the location of the sender's  
15 mobile communications device is automatically sensed;

receiving data relating to one or more images, said images having been  
identified using said obtained location by searching a geocoded database  
comprising data for images representing places or objects which relate to  
predetermined geographic locations or areas;

20 receiving input from the sender relating to a selected image;  
transmitting data to said service node to confirm a selection of the  
sender;

receiving input from the sender relating to message data from the  
sender, said message data being intended to accompany the selected image;

25 receiving input from the sender relating to a selected recipient; and  
transmitting data to a service node to allow the selected recipient to  
access said selected image and said message data.

17. A method for enabling the communication of messages  
30 comprising images to a recipient specified by a sender operating a mobile  
communications device, said method comprising:

deriving the location of a sender's mobile communications device by a process in which the location of the sender's mobile communications device is automatically sensed;

transmitting said derived location to a service node using said derived  
5 location to search a geocoded database comprising data for images representing places or objects which relate to predetermined geographic locations or areas;

receiving data relating to one or more of said images from a service node and transmitting same to the sender's mobile communications device;

receiving a selection from the sender relating to a selected image and  
10 transmitting same to a service node;

receiving message data from the sender and transmitting same to a service node, said message data being intended to accompany the selected image, to allow the service node to generate a message to allow a recipient to access said selected image and said message data.

15

18. A method for enabling the communication of messages comprising images to a recipient specified by a sender operating a mobile communications device, said method comprising:

obtaining the location of a sender's mobile communications device,  
20 said location having been derived by a process in which the location of the sender's mobile communications device is automatically sensed;

using said obtained location, searching a geocoded database comprising photographic images which relate to predetermined geographic locations or areas;

25 retrieving data relating to one or more of said photographic images and transmitting same to the sender's mobile communications device.

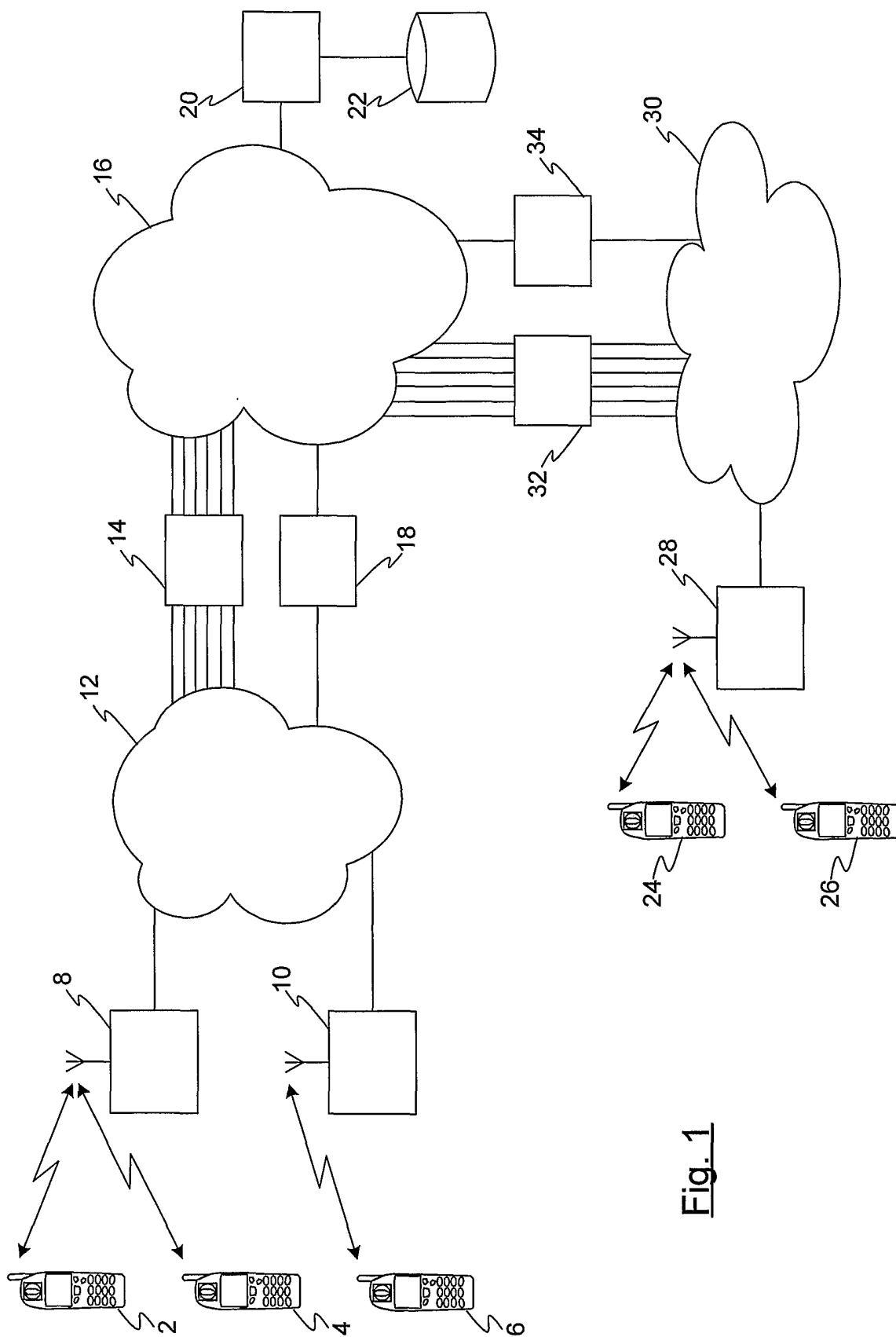


Fig. 1



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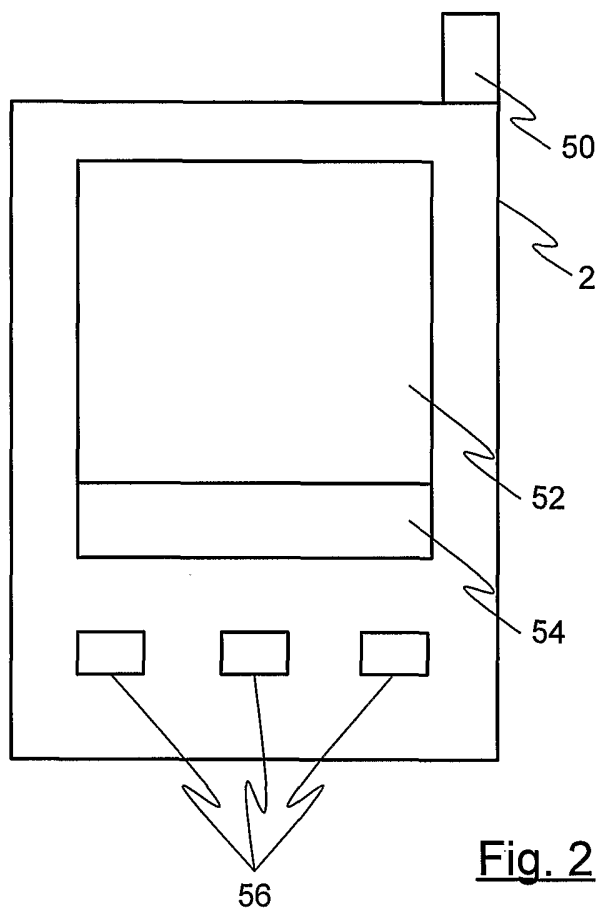


Fig. 2

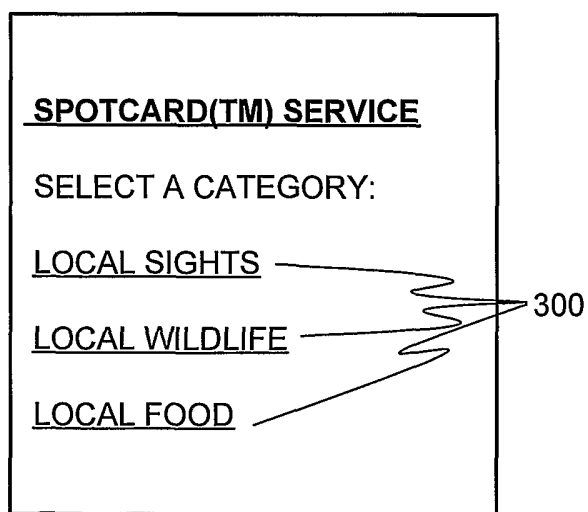


Fig. 5

3/6

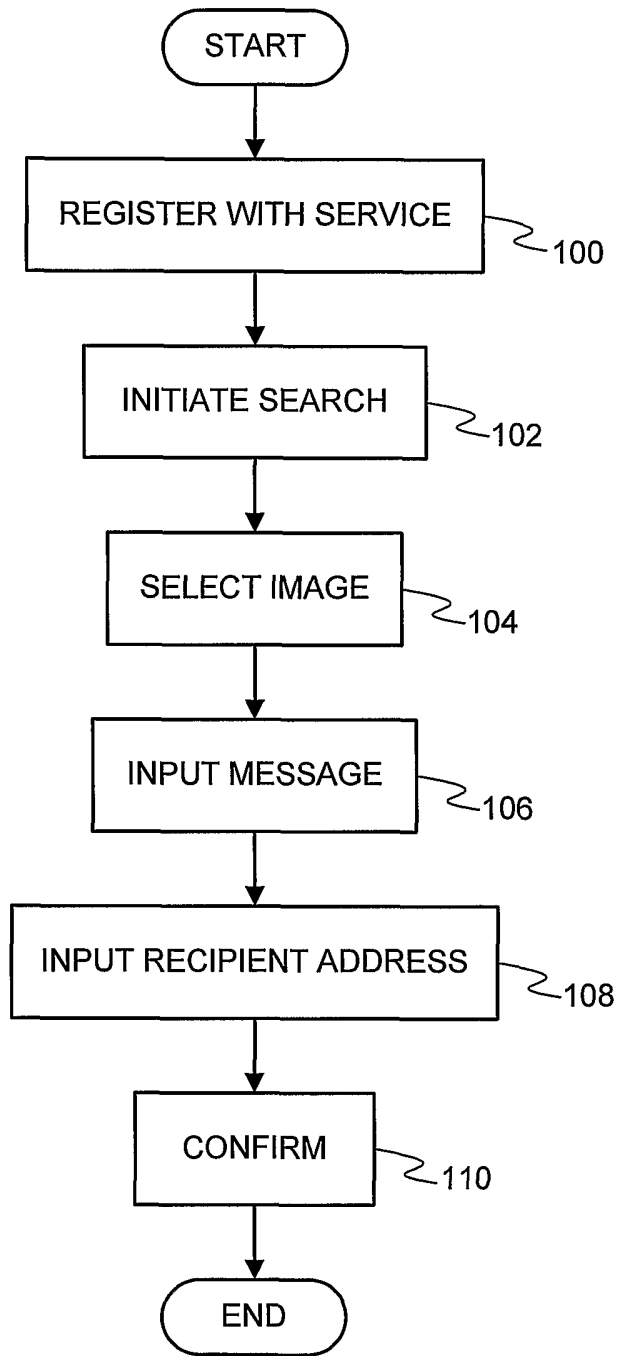


Fig. 3

4/6

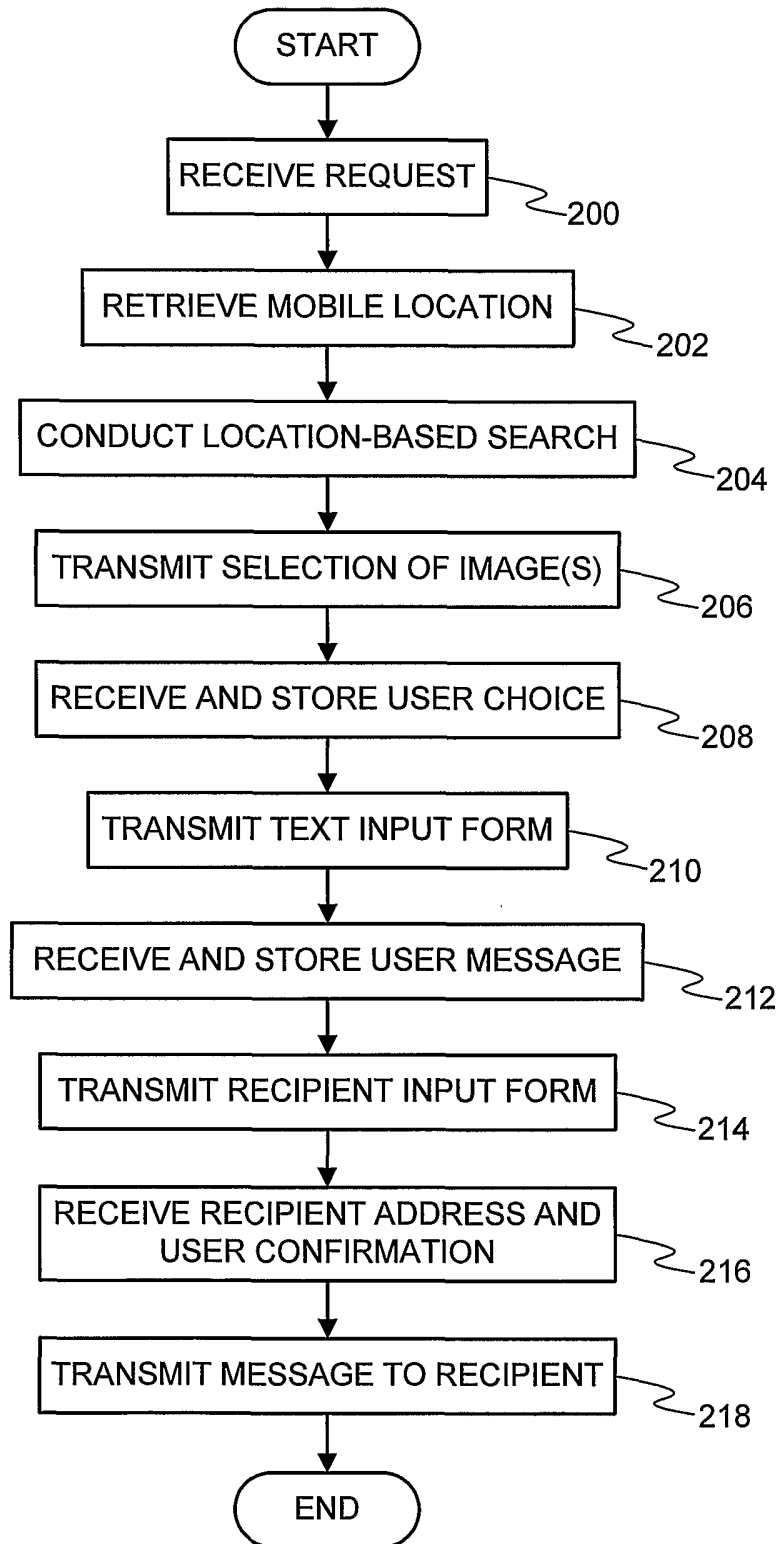


Fig. 4

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302

SELECT A SIGHT:	
<u>SIGHT</u>	<u>DISTANCE</u>
<u>BIG BEN</u>	100 M
<u>HOUSES OF PARLIAMENT</u>	140 M
<u>NELSON'S COLUMN</u>	900 M

Fig. 6

304

SELECT WILDLIFE:	
<u>TYPE</u>	<u>AREA</u>
<u>SHREW</u>	UK
<u>LONDON FOX</u>	LONDON
<u>HEDGEHOG</u>	UK

Fig. 7

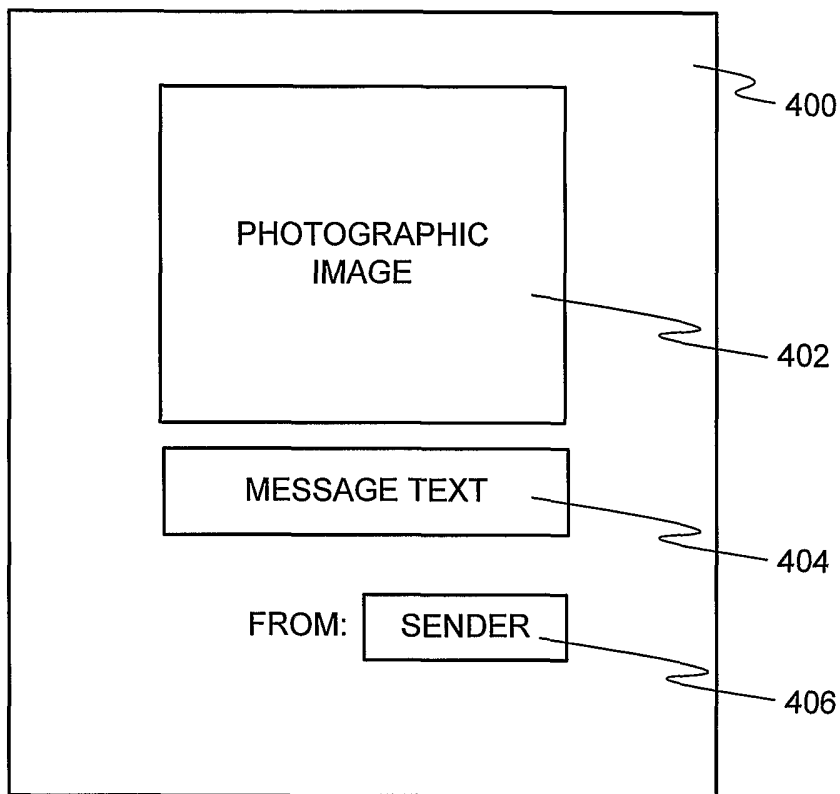


Fig. 8