(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
9 June 2011 (09.06.2011)

PCT

(10) International Publication Number
WO 2011/068622 A1

(51) International Patent Classification:
H04M 1/725 (2006.01) *H04M 3/487* (2006.01)
H04W 4/02 (2009.01) *G06F 3/01* (2006.01)

(21) International Application Number:
PCT/US2010/055585

(22) International Filing Date:
5 November 2010 (05.11.2010)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
12/629,927 3 December 2009 (03.12.2009) US

(71) Applicant *(for all designated States except US)*: **OSO-CAD REMOTE LIMITED LIABILITY COMPANY** [US/US]; Atten Dept 281, 2711 Centerville Road, Suite 400, Wilmington, Delaware 19808 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **PATOSKIE, John** [US/US]; 708 Beaumont Ct, Allen, Texas 75013 (US). **GERARD, Mark** [US/US]; 8244 Mura Drive, Plano, Texas 75025 (US). **WHEELER, Thomas** [US/US]; 7971 Highpoint Ridge, Frisco, Texas 75035 (US).

(74) Agents: **COWGER, Graciela G.** et al.; Stolowitz Ford Cowger LLP, 621 SW Morrison Street, Ste 600, Portland, Oregon 97205 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

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

(54) Title: METHOD, APPARATUS AND COMPUTER PROGRAM TO PERFORM LOCATION SPECIFIC INFORMATION RETRIEVAL USING A GESTURE-CONTROLLED HANDHELD MOBILE DEVICE

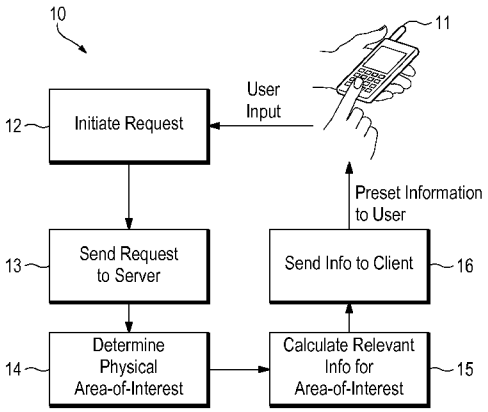

FIG. 1

(57) Abstract: A method and apparatus (10) are disclosed that calculate (14) an area-of - interest based on a user request (12) for location specific data. The operations may include transmitting (13) initial location data of the mobile terminal (11) and user initiated gesture data to a server. The server may then perform initiating (12) a request to receive the requested location data, and calculating (14) a geographical area-of - interest based on the initial location data and the user initiated gesture data. The location specific data related to the area-of - interest may then be retrieved (15) and transmitted (16) to the mobile terminal (11). The area-of - interest may be defined based on the initial position of the mobile terminal (11) and information provided by a gesture made by the user of the mobile terminal (11).

WO 2011/068622 A1

METHOD, APPARATUS AND COMPUTER PROGRAM TO PERFORM LOCATION SPECIFIC INFORMATION RETRIEVAL USING A GESTURE-CONTROLLED HANDHELD MOBILE DEVICE

FIELD OF THE INVENTION

[0001] The present inventive concept is related to a location-specific information retrieval method and apparatus that implements gesture-controlled handheld mobile devices.

BACKGROUND OF THE INVENTION

[0002] Mobile location specific computing is made possible by the availability of small, fast and wireless hand-held processing devices equipped with location identification capabilities. Examples of location identification services may include compass-related functions (i.e., latitude and longitude based location tools) and GPS receivers with additional capabilities such as distance and time-related calculations used to arrive at a desired target location.

[0003] Mobile communications systems implement location-specific add-on features that include various different location estimation techniques, such as, E-OTD (Enhanced Observed Time Difference), FOTA (Forced Timing Advance), TA (Timing Advance), TDOA (Time Difference Of Arrival) and TOA (Time Of Arrival) etc.

[0004] Hybrid systems are also used by mobile communications systems that incorporate a conventional location method, such as, those mentioned above, and which also rely on satellite-based location systems, such as, GPS (Global Positioning System) or Galileo. These types of

systems may offer more accurate location services or other advanced location features.

[0005] Broadcast cellular systems may also be combined with GPS in mobile environments to provide location-specific services to mobile stations. In such combined implementations, normally a central or distributed control site (e.g., Base Station Controller, Mobile Station Controller) determines the requested information content based on the received user request and provides the user with feedback from a database accessible via the mobile network. In this example, an auxiliary channel must be provided between the mobile user receiving device and the control center to provide the location-specific information content to the mobile user.

[0006] Broadcast cellular systems are normally only cost effective in very large service areas of hundreds of square miles. As for smaller areas, the use of such a system can hardly be justified for users with specific needs and preferences. For example, users who are limited to a smaller geographical location may have less success when trying to pinpoint a location and provide feedback location information to the network regarding their surroundings.

[0007] Currently, the techniques used for location-specific services access a computer network in order to search for a user's desired information. In these types of location service models, data may be retrieved from external data sources, processed for location-related queries and transmitted to the user's portable device. Such a combination of operations may be time consuming and load heavy on system resources. Additionally, such location service models are limited in their ability to

offer user selection services. For instance, the user's preferences and involvement (i.e., defining an area of interest) during the execution of a location service application may be limited or non-existent altogether.

[0008] In addition to general conventional location services for mobile users, there are also known ways to track the movement or gestures made by a user of a wireless transmitting device. For example, a sensing device may be used for determining and measuring linear and/or arc movements of a human body by an accelerometer. Sensing and transmitting data related to movements of a human body may be accomplished by sending the data by a wireless transmitter of the user's device to other electrical peripheral devices, which enables the user to interact with those electrical peripheral devices in a multimedia fashion.

[0009] Accelerometers and other signal processing devices may track user movement and provide real-time updated user movement via an electronic transmitting device. Furthermore, the location specific needs of users of wireless terminals may be handled faster and with more detailed precision if the application servers are fully aware of the user's location between location information transfers between the user device and the application servers.

SUMMARY OF THE INVENTION

[0010] Disclosed is an optimized method and apparatus to receive location specific information from a gesture-controlled handheld mobile device and to calculate additional location information based on the user's request by taking into consideration the user's area-of-interest by

including arc gesture data provided by the mobile device and the user's current location.

[0011] One example embodiment of the present inventive concept includes a method of providing requested location data to a mobile terminal. The method includes transmitting initial location data of the mobile terminal and user initiated gesture data to a server. The method also includes initiating a request to receive the requested location data. The method also includes calculating a geographical area-of-interest based on the initial location data and the user initiated gesture data. The method further includes retrieving location specific data related to the area-of-interest, and transmitting the area-of-interest and the related location specific data to the mobile terminal.

[0012] Another example embodiment of the present inventive concept may also include an apparatus configured to provide requested location data to a mobile terminal. The apparatus includes a receiver configured to receive initial location data of the mobile terminal and user initiated gesture data, and to initiate a request to receive the requested location data. The apparatus also includes a processor configured to calculate a geographical area-of-interest based on the initial location data and the user initiated gesture data, and to retrieve location specific data related to the area-of-interest. The apparatus further includes a transmitter configured to transmit the area-of-interest and the related location specific data from the mobile terminal.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] FIG. 1 illustrates a system block diagram according to an example embodiment of the present inventive concept.

[0014] FIG. 2 illustrates a flow diagram of the client server model according to an example embodiment of the present inventive concept.

[0015] FIG. 3 illustrates another flow diagram of the hardware components of the client server model according to an example embodiment of the present inventive concept.

[0016] FIG. 4 illustrates a flow diagram according to the operations included in an example embodiment of the present inventive concept.

[0017] FIG. 5 illustrates another flow diagram that continues from FIG. 4 according to the operations included in an example embodiment of the present inventive concept.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0018] FIG. 1 illustrates a system diagram 10 according to an example embodiment of the present inventive concept. Referring to FIG. 1 a user device 11, such as, a mobile terminal (MT) provides a user input at operation 12 that may be, for example, an initiated request for a location or simply user location information of the current location of the MT 11. The user request may be sent to a server at operation 13 at a local base station (BS) or to a remote server location.

[0019] Further to the operations of FIG. 1, operation 14 provides that the request is received and a physical area-of-interest is determined for the user based on the requested information and/or the user's current location. A database (not shown) may be accessed to reference

previously stored user parameters, which may provide additional input for calculating a relevant area-of-interest (i.e., a local facility, a target geographical area, etc.) at operation 15. Once the area-of-interest is calculated, the relevant information may then be sent to the client/user MT 11 at operation 16.

[0020] Referring to the operations of the system model 10 in greater detail, FIG. 2 illustrates further example operations that are performed between the MT 11 and the server side of the system network. The MT 11 may instead by referred to as a client device 101 which communicates with a server device 102 at a remote location.

[0021] Referring to FIG. 2, the client device 101 may be a handheld computer or mobile terminal (MT) capable of locating its position (e.g., latitude, longitude and/or direction), via an internal and/or external compass, which may also include a GPS device. The server device 102 may be a general purpose computer capable of providing processing and database services to the client 101.

[0022] In operation, the client device 101 initiates a request 110 that is processed at operation 120 and is sent to the server 102. Once the request is received, the server 102 determines the physical area-of-interest (operation 130) based on the client's current geographical position and further based on the client's gesture and/or movement. The combination of the client's position and gesture are both taken into consideration when calculating the relevant area-of-interest information (i.e., a boundary estimate of the client's desired targeted area) at operation 140. The information provided by the server is sent to the client 101 (operation 150) and is presented to the user (operation 160).

[0023] FIG. 3 illustrates a block diagram of the hardware components used in an example communication transfer between the client 101 and the server 102. The user device 11 illustrates an example computing device, such as, a mobile phone or hybrid personal digital assistant (PDA) and mobile phone. The client 101 represents the processing modules used in the user device 11.

[0024] The gesture processing module 310 receives the user input gesture, which may include, for example, a voice command, a movement of the user device 11, a change in direction of the user device 11, etc. The gesture processing module 310 may then forward the gesture information and the user's current position information (e.g., GPS location information) to the sending communications module 320, which then transmits the information to the server 102 via a wireless connection over a local and/or remote communications network.

[0025] The receiving communications module 330 of the server 102 receives the location and gesture related information and forwards it to the request processing module 340 which initiates a request for stored data and other resources to assist in predicting and calculating an area-of-interest. For example, the request processing module 340 will interpret the received location information and determine the coordinates and the location origin of the area-of-interest.

[0026] The server 102 further calculates the relevant information needed to determine the area-of-interest by the data retrieval module 350. The information gathered for the user may include information related to the request itself (i.e., a gas station, bank, service area) and may

also include relevant advertisement data related to other services within the area-of-interest defined by the data retrieval module 350.

[0027] Once the information related to the request is obtained, the user requested data will be forwarded to the client device 101 via the sending communications module 360, and received at the client device 101 via the receiving communications module 370. The client device 101 may further process the information before presenting the requested data to the user of the client device 101. The client device 101 will receive the sent information, which will be presented to the user by the client device 101.

[0028] The information provided by the client device 101 to the server 102 will include both a location estimate of the client device 101 and gesture data. For instance, an initial GPS location position of the mobile client device 101 may be obtained via an estimate provided by a satellite. In addition, a gesture performed by the user of the client device 101 will be combined with the GPS location estimate.

[0029] The gesture portion of the data will be used to determine a target area-of-interest. For example, the movement of the client device 101 in a particular direction may be discerned as being a valid gesture which will narrow the area-of-interest to a particular direction near the original GPS calculated location of the mobile device 101 (i.e., relevant location information in the direction moved). In a two-dimensional coordinate system, the GPS estimate location of the client device 101 may be used to represent a starting point, and, the gesture (i.e., movement of the user in a particular direction) may be used to move from the point to create an arc of movement data.

The arc can in turn be used to define a region or area-of-interest.

[0030] The gesture may be initiated by a command, for example, a simple push button indicating a direction arrow pointing in a direction of interest. The gesture may instead be a vocal command that indicates a direction (i.e., "north") or object that may be recognized by the server as a valid gesture that assists in defining a region or area-of-interest. For instance, the movement of the device may be interpreted as a two-dimensional arc that is tracked and stored in memory as gesture data defining the area-of-interest.

[0031] Another example of a gesture may be providing a direction in a well-defined shopping area. For instance, a user of a mobile terminal may initiate a request by conducting a gesture for information while being located in a shopping plaza. The user's current position may be located as being on the sidewalk by a GPS satellite. The user may then gesture towards a store by moving the client device in the direction of the store. This movement may constitute a valid gesture that is used with the GPS data to provide information regarding the store. As a result, the user may receive information about the store (e.g., coupons, advertising, details of merchandise etc.).

[0032] In another example, according to an example embodiment of the present inventive concept, the arc-description may be generated by a separate device (e.g. separate apparel worn by the user). For instance, a bluetooth enabled device (i.e., a pair of sunglasses) may offer another way to communicate gesture data (via the direction of the user's head) to the mobile device, which may be interpreted as a valid gesture by the server 102. A

locally paired device that is capable of communicating with the mobile device may provide an alternative to offering gesture data, provided that the external device has the requisite compass (i.e., orientation) functionality.

[0033] In the case of an orientation only type of gesture, a direction of the device is used to represent a valid gesture. Such an example gesture would require a compass functionality and would offer a direction and an angle that could be measured to identify the direction the user is pointing without any arc movement being generated. In turn, the angle could then be used to provide a direction of interest, which could then be defined as a larger area-of-interest.

[0034] Providing the information to the user may be accomplished by a server or a plurality of distributed servers. The plurality of distributed servers can offer individualized treatment of the requests depending on the local information stored in each server. The information may be presented to the user via text message, push email or an executable application on the user device.

[0035] The server 102 calculations that may be performed based on device location information and user gesture information may include narrowing the area-of-interest by beginning at a single point. For example, a circle-shaped region based on a point may be narrowed by offering an angle based on the gesture information that could be used to narrow a section of the circle. The arc path generated from the user gesture information could define a pie slice of the circle as an area of interest. Translating the pie slice to a map, may offer the locations of stores or facilities wholly or partially within only the defined pie slice.

[0036] Server calculations include converting the user supplied area-of-interest (arc) and "fitting" it to a preset granularity for the categorization of information (e.g. the server may use 60 degree arcs in hexagons or circles of map data). The client 101 and server 102 may exchange client-to-server and server-to-client information. The links between client 101 and server 102 may be wireless links enabled directly or through other transport networks. The client 101 may initiate an area-of-interest request that may include an initial compass heading and gesture data.

[0037] The request which may include location, compass heading, gesture arc, and distance information, may be sent to the server 102 by the sending unit 120. The sending unit, in turn, should generally be equipped with all necessary functions and hardware required to communicate with the server 102.

[0038] More precise user preferred location information may be generated by using a combination of a predetermined location (i.e., latitude and longitude determined via GPS or other location method) and a gesture as input to an information source. In addition, a remote database of location-relevant information filtered by user preferences may offer more precise user preferred location information when compared to the predetermined location and gesture information. In addition, the area-of-interest may be determined on the client device 101 before sending the request to a server 102. The server 102 could further modify the area-of-interest or simply just populate the area-of-interest with facility information of nearby stores, gas stations or other user preferred facility information.

[0039] The user's request for information pertaining to a particular area-of-interest may provide optimized use of the system resources, such as, bandwidth and network resources. For instance, by pre-storing user preferences and receiving user initiated area-of-interest information, the system may offer fast and optimized location information to the user without requiring excessive bandwidth requirements or processing resources. There may also be a reduction in the overall amount of irrelevant information being sent to the user.

[0040] In general, the gestures provide an input mechanism for human interfacing with a computer or a handheld device. Computers and handheld devices equipped with gesture recognition sensors provide the necessary hardware and software to recognize gesture input related to hand movements or vocal commands in varying degrees of complexity. Some recognition systems utilize planar two-dimensional (2D) or three-dimensional (3D) accelerometers embedded in handheld devices, which, in turn, communicate the human initiated data to their respective computing engines to provide data geared at offering integrated human input and location information requests for additional information.

[0041] Fig. 4 illustrates an example flow diagram of the communications conducted between a user and a remote location information server, according to an example embodiment of the present inventive concept. Referring to FIG. 4, a user makes a gesture at operation 400, it is then determined by the user device or the server whether the gesture is a valid known type of gesture at operation 401. If not, the user is informed that gesture is not valid or there is no result from that invalid gesture at operation

403. If the gesture is valid the gesture information is forwarded to the gesture server provided the server is available at operation 404. If the server is not available, the user is informed or the process does not move forward at operation 405, and the process will end at 403.

[0042] If the server is available, the server proceeds to define the area-of-interest based on the information it receives and information which may be known to the server at operation 406. The server will receive a request sent for location information at operation 407 and if the request is properly received, the operations will continue to operation 410 denoted by "A", and the process will further be continued at FIG. 5. If the request is lost, operation 409 will create an error message to re-transmit the request.

[0043] Referring to FIG. 5, further details of the location information processing between the client and server is disclosed. For instance, continuing at "A", now that the preliminary communications between the client and server have commenced. The additional client operations are illustrated on the left and the server operations are illustrated on the right. These operations may be conducted independently by the client and/or server, or, alternatively, may be conducted in parallel.

[0044] After receiving the area of interest request, the server validates the request at operation 508 from the client. Once the request is deemed valid, the server calculates at operation 510 the geospatial boundaries of the physical area that the user had indicated via the gesture input to determine the physical area-of-interest. If the request is not valid, an invalid request response

will be generated and sent to the user at operation 509, and the process will end at "B" operation 514. Moving forward, the server will further determine the relevant stores included in the area-of-interest defined at operation 511. Based on the results of operation 511, the server will also determine the relevant advertisements at operation 512 by cross-referencing the relevant stores with advertisement information stored in a database. The server will then send the results to the user at operation 513 and will end at "B" in operation 514.

[0045] Referring to the left side of FIG. 5, while the server is validating and locating the area-of-interest and its related content, the client device is standing by and waiting for the response at operation 501. During this time period of waiting, the client device keeps checking for the server response while keeping track of time at operation 502. If a predefined timeout period expires, the client will be informed that no response was received at operation 506 and the process will end at 503.

[0046] On the other hand, if the response is received within the timeout period and the result of the server operations "B" is provided to the client, it is then determined whether the request is valid or invalid at operation 504. If the request is considered invalid the client is informed at operation 507, and the process ends at operation 503. If the request is deemed valid, the client is informed of the results at operation 505, and the process ends at operation 503.

[0047] The present inventive concept is preferably realized in a hardware device, such as, a computer, cellular phone, or other mobile terminal device etc. In other embodiments, the present invention may be realized in

hardware, software, firmware or a combination of hardware, software and/or firmware.

[0048] The above example embodiments may also be implemented in software code and may be stored on a computer readable medium, such as, for example, non-volatile memory devices (e.g., RAM, ROM, hard disk etc.). The software code may be accessed from the computer readable medium and may be executed by a processor. The executed program may provide one or more of the features of the example embodiments.

[0049] While preferred embodiments of the present invention have been described, it is to be understood that the embodiments described are illustrative only and the scope of the invention is to be defined solely by the appended claims when considered with a full range of equivalents and modifications (e.g., protocols, hardware devices, software platforms etc.) thereto.

CLAIMS

WHAT IS CLAIMED IS:

1. A method of providing location specific data to a mobile terminal, the method comprising:

transmitting initial location data of the mobile terminal and user initiated gesture data to a server;

initiating a request to receive the requested location data;

calculating a geographical area-of-interest based on the initial location data and the user initiated gesture data;

retrieving location specific data related to the area-of-interest; and

transmitting the related location specific data to the mobile terminal.

2. The method of claim 1, wherein the gesture data transmitted to the server comprises a movement of the mobile terminal in a particular direction.

3. The method of claim 1, wherein the gesture data transmitted to the server comprises a voice command made by the user of the mobile terminal.

4. The method of claim 1, wherein the gesture data is a button selection entered into the mobile terminal.

5. The method of claim 1, wherein the location specific data includes facilities located within the area-of-interest.

6. The method of claim 5, wherein the facilities comprise at least one of shopping facilities and service facilities.

7. The method of claim 1, wherein the location specific data includes advertisements of facilities located within the area-of-interest.

8. The method of claim 1, wherein the initial location data is provided by a GPS position estimate.

9. The method of claim 1, wherein the gesture data is provided by a direction estimate from a compass component of the mobile terminal.

10. An apparatus configured to provide location specific data to a mobile terminal, the apparatus comprising:

a receiver configured to receive initial location data of the mobile terminal and user initiated gesture data, and to initiate a request to receive the requested location data;

a processor configured to calculate a geographical area-of-interest based on the initial location data and the user initiated gesture data, and to retrieve location specific data related to the area-of-interest; and

a transmitter configured to transmit the related location specific data to the mobile terminal.

11. The apparatus of claim 10, wherein the gesture data received at the receiver comprises a movement of the mobile terminal in a particular direction.

12. The apparatus of claim 10, wherein the gesture data received at the receiver comprises a voice command made by the user of the mobile terminal.

13. The apparatus of claim 10, wherein the gesture data is a button selection entered into the mobile terminal.

14. The apparatus of claim 10, wherein the location specific data includes facilities located within the area-of-interest.

15. The apparatus of claim 14, wherein the facilities comprise at least one of shopping facilities and service facilities.

16. The apparatus of claim 10, wherein the location specific data includes advertisements of facilities located within the area-of-interest.

17. The apparatus of claim 10, wherein the initial location data is provided by a GPS position estimate.

18. The apparatus of claim 10, wherein the gesture data is provided by a direction estimate from a compass component of the mobile terminal.

19. The apparatus of claim 10, further comprising:

a peripheral device worn by the user that communicates the gesture data to the mobile terminal.

20. A computer readable medium embodying a computer program that when executed controls a processor to perform:

transmitting initial location data of a mobile terminal and user initiated gesture data to a server;

initiating a request to receive location specific data;

calculating a geographical area-of-interest based on the initial location data and the user initiated gesture data;

retrieving location specific data related to the area-of-interest; and

transmitting the related location specific data to the mobile terminal.

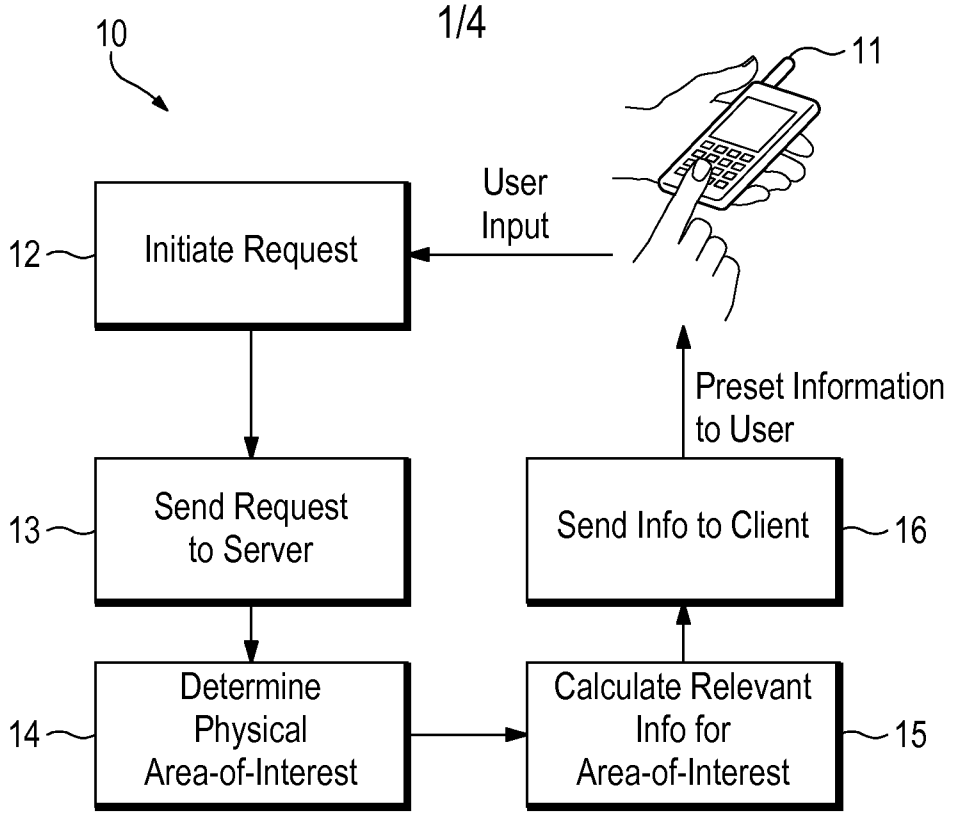
10
11
User Input
12
Initiate Request
Preset Information to User
13
Send Request to Server
Send Info to Client
16
14
Determine Physical Area-of-Interest
Calculate Relevant Info for Area-of-Interest
15

FIG. 1

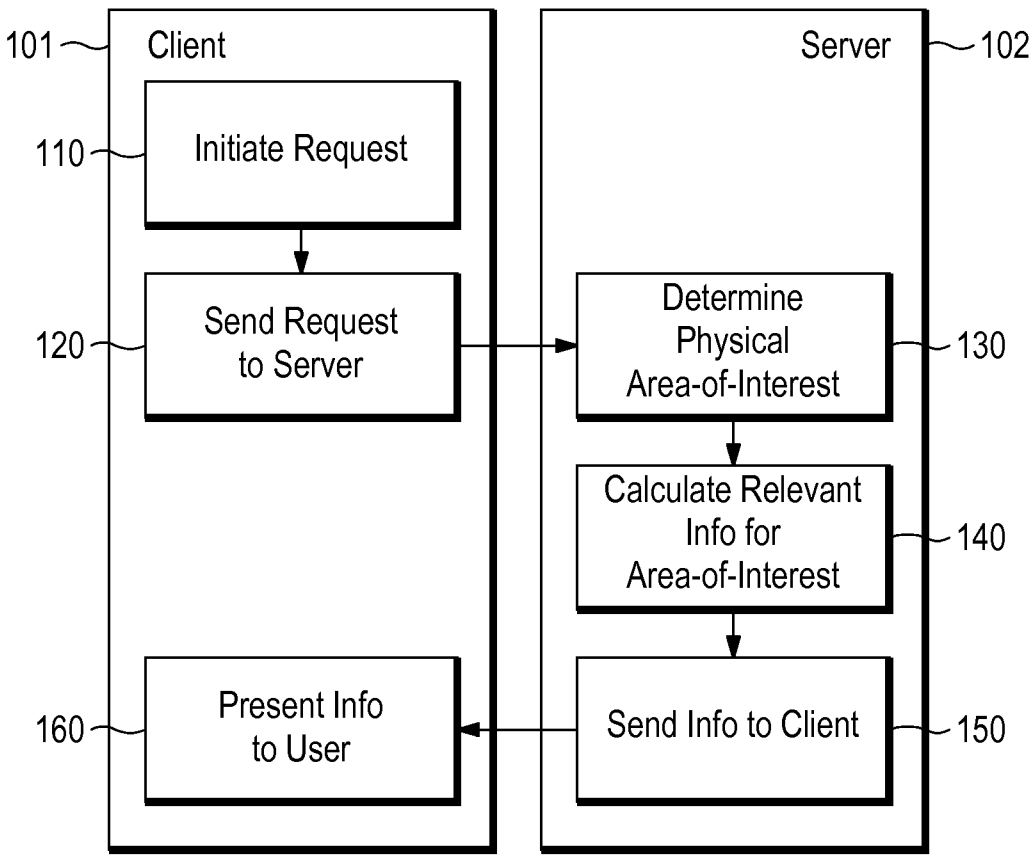
101
Client
Server
102
110
Initiate Request
120
Send Request to Server
Determine Physical Area-of-Interest
130
Calculate Relevant Info for Area-of-Interest
140
160
Present Info to User
Send Info to Client
150

FIG. 2

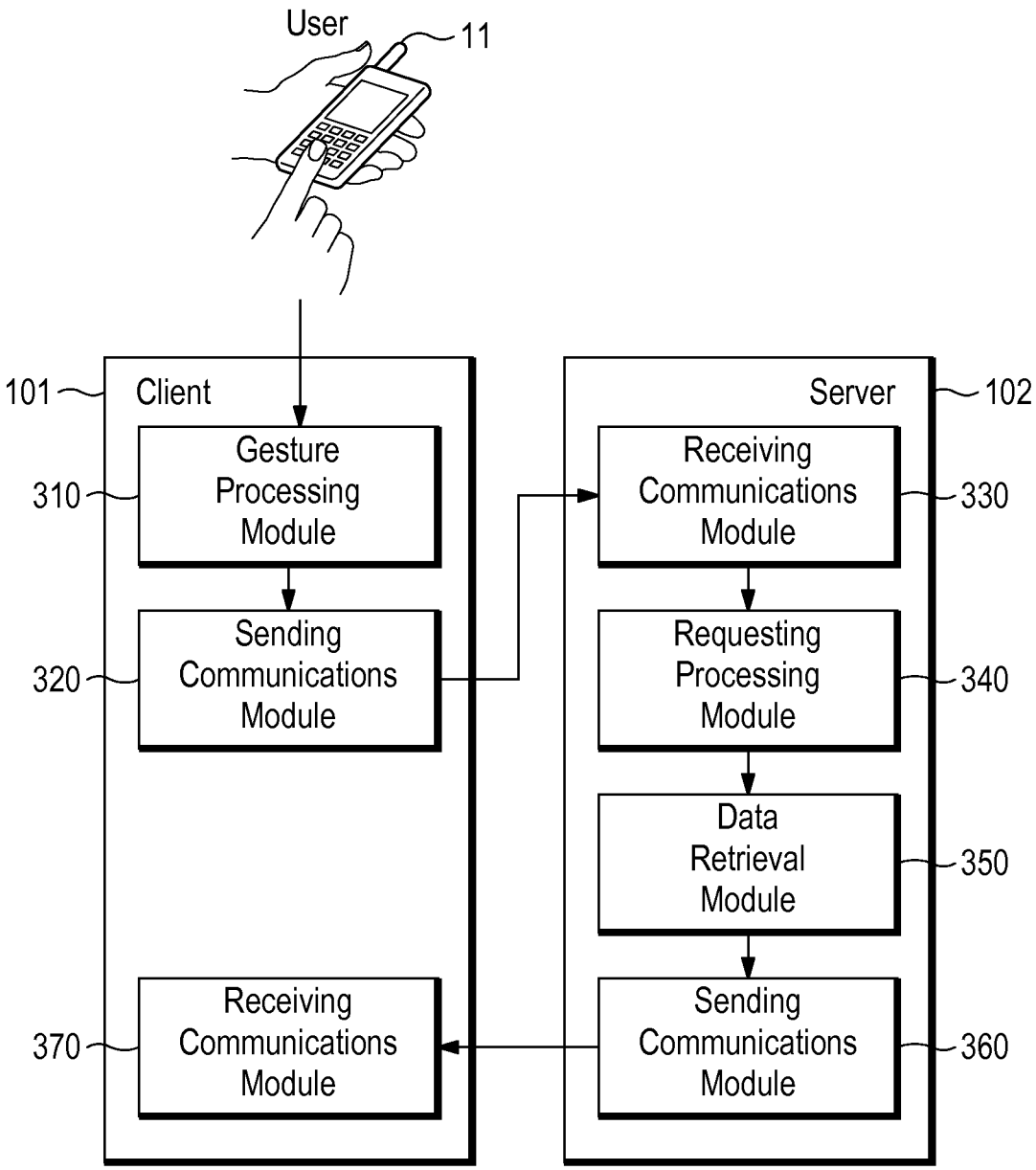
User
11
101
Client
Server
102
Gesture Processing Module
310
Sending Communications Module
320
Receiving Communications Module
330
Requesting Processing Module
340
Data Retrieval Module
350
Sending Communications Module
360
Receiving Communications Module
370

FIG. 3

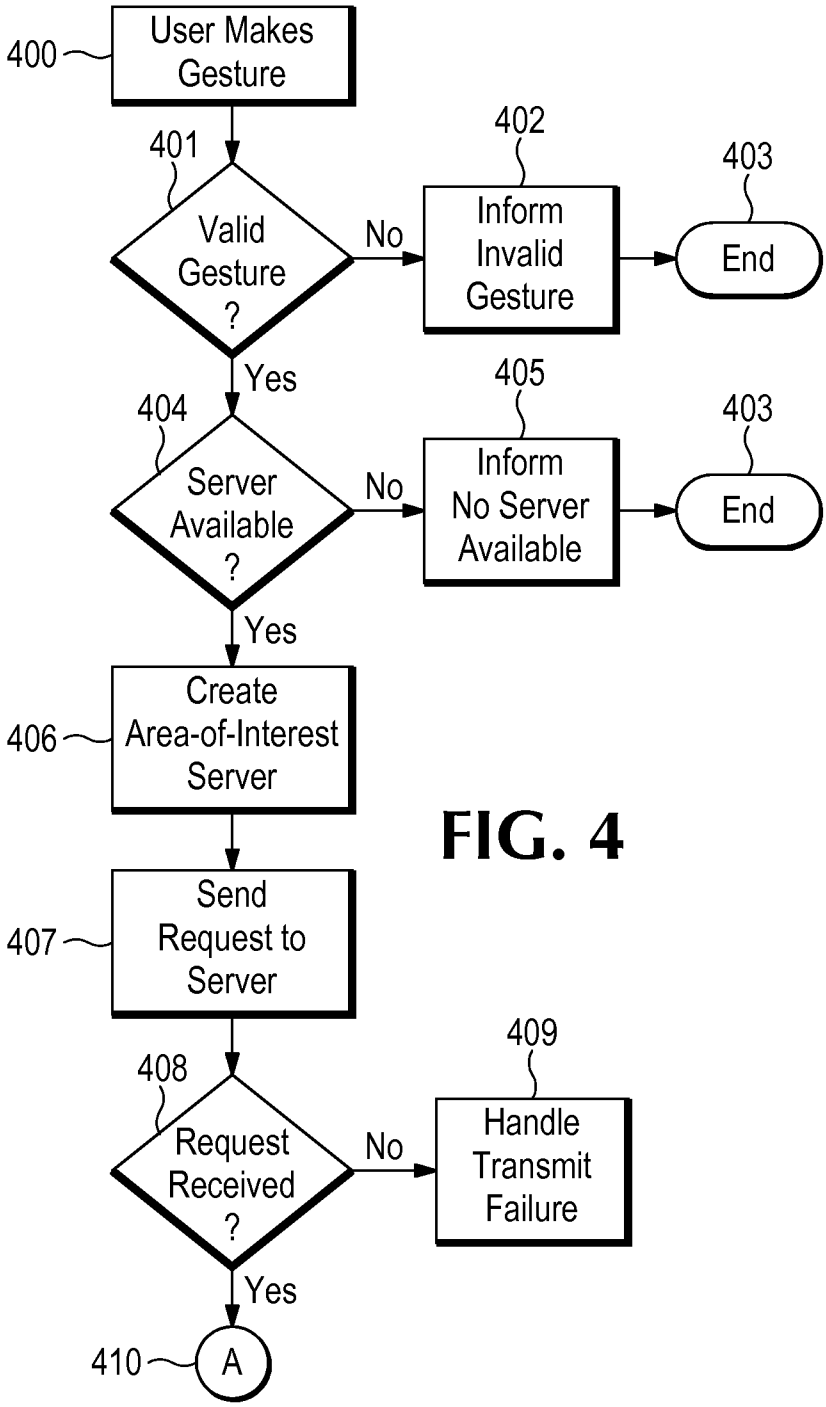
400
User Makes Gesture
401
Valid Gesture ?
No
402
Inform Invalid Gesture
403
End
Yes
404
Server Available ?
No
405
Inform No Server Available
403
End
Yes
406
Create Area-of-Interest Server
407
Send Request to Server
408
Request Received ?
No
409
Handle Transmit Failure
Yes
410
A

FIG. 4

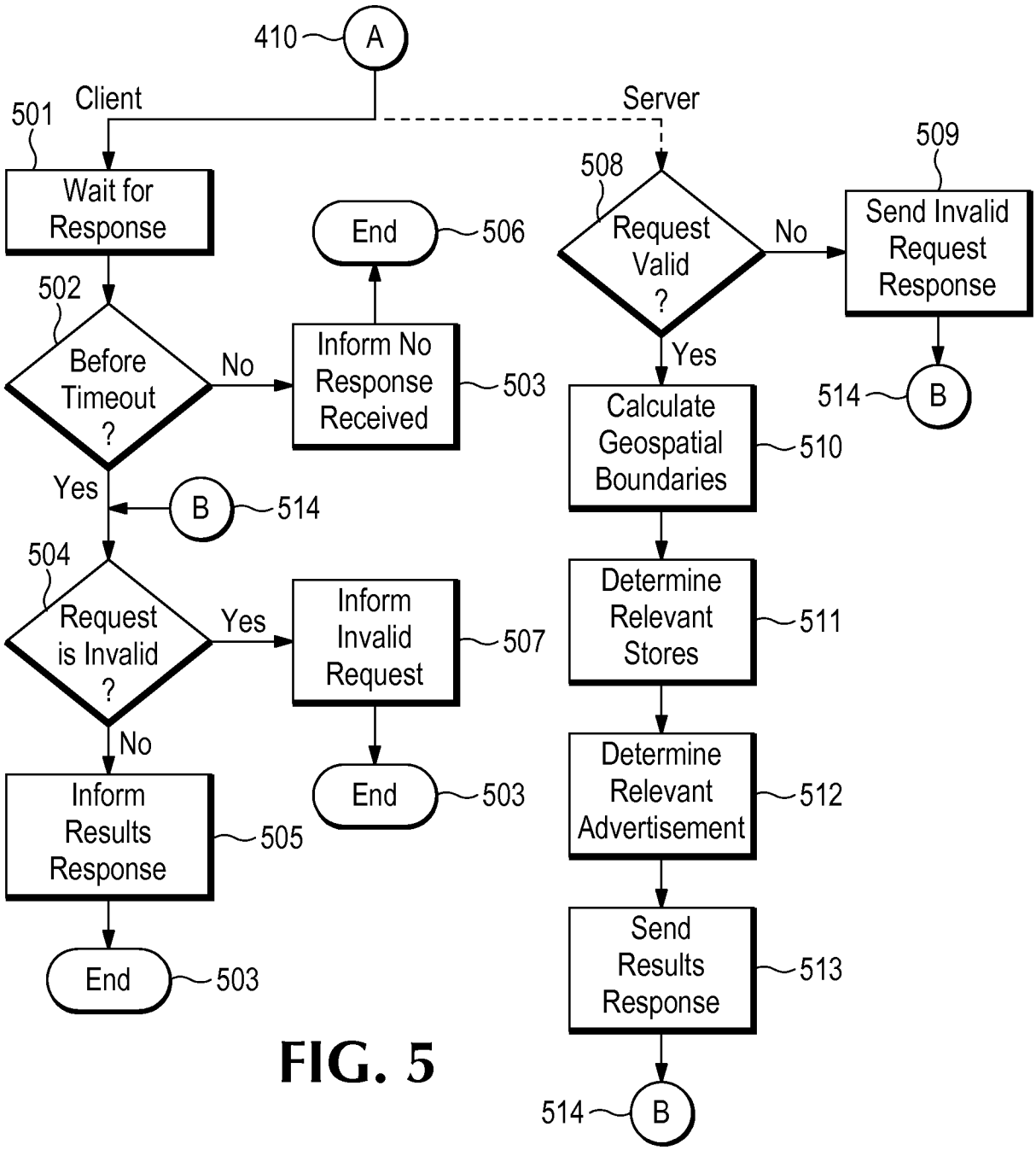
410
A
Client
Server
501
Wait for Response
502
Before Timeout ?
No
Inform No Response Received
503
End
506
Yes
B
514
504
Request is Invalid ?
Yes
Inform Invalid Request
507
End
503
No
Inform Results Response
505
End
503
508
Request Valid ?
No
509
Send Invalid Request Response
514
B
Yes
Calculate Geospatial Boundaries
510
Determine Relevant Stores
511
Determine Relevant Advertisement
512
Send Results Response
513
514
B

FIG. 5

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2010/055585

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04M1/725 H04W4/02 H04M3/487 G06F3/01
ADD.

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)
H04M H04W G06F

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2006/161379 A1 (ELLENBY THOMAS W [US] ET AL) 20 July 2006 (2006-07-20) the whole document	1-20
X	WO 2007/132055 A1 (NOKIA CORP [FI]; BODA PETER [FI]) 22 November 2007 (2007-11-22) the whole document	1-20
X	WO 2009/104088 A1 (NOKIA CORP [FI]; WIROLA LAURI AARNE JOHANNES [FI]; HALIVAARA ISMO KULL) 27 August 2009 (2009-08-27) the whole document	1-20
A	WO 95/07526 A1 (CRITICOM CORP [US]; ELLENBY JOHN [US]; ELLENBY THOMAS W [US]) 16 March 1995 (1995-03-16) page 16, line 11 - line 30; figures 1,5	19

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"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

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
24 February 2011	07/03/2011

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Kanlis, Angelos

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2010/055585

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006161379 A1	20-07-2006	EP 1354260 A2	22-10-2003
		JP 2004531791 T	14-10-2004
		JP 2008171410 A	24-07-2008
		JP 2010205281 A	16-09-2010
		NZ 560769 A	30-04-2009
		WO 02059716 A2	01-08-2002
		US 2002140745 A1	03-10-2002
WO 2007132055 A1	22-11-2007	US 2007275691 A1	29-11-2007
WO 2009104088 A1	27-08-2009	CN 101952845 A	19-01-2011
		EP 2260444 A1	15-12-2010
		US 2009319605 A1	24-12-2009
WO 9507526 A1	16-03-1995	AT 256327 T	15-12-2003
		AU 691508 B2	21-05-1998
		AU 7314694 A	27-03-1995
		CA 2171314 A1	16-03-1995
		CH 689904 A5	14-01-2000
		DE 69433405 D1	22-01-2004
		EP 0722601 A1	24-07-1996
		JP 9505138 T	20-05-1997
		JP 3700021 B2	28-09-2005
		NZ 269318 A	19-12-1997
		US 6031545 A	29-02-2000
		US 5815411 A	29-09-1998
		US 5742521 A	21-04-1998
		US 5682332 A	28-10-1997
		US 6307556 B1	23-10-2001