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Alexandria, VA 22313-1450

Patent Number	8,170,583
Issue Date	05/01/2012
Application Number	12/720,362
Filing Date	03/09/2010
First Named Inventor	Shkedi, Roy
Attorney Docket Number	BP-CON1

Please change the Correspondence Address for the above-identified patent to:

☐ The address associated with Customer Number:

OR

☒ **Firm or
Individual Name** Roy Shkedi

Broadphone, LLC
69-10 108th Street
Apt. 10K

Address

City Forest Hills

State NY

ZIP 11375

Country US

Telephone (646) 770-1290

Email rshkedi@broadphone.com

This form cannot be used to change the data associated with a Customer Number. To change the data associated with an existing Customer Number use "Request for Customer Number Data Change" (PTO/SB/124).

This form will not affect any "fee address" provided for the above-identified patent. To change a "fee address" use the "Fee Address Indication Form" (PTO/SB/47).

I am the:

☐ Patentee.

☐ If the Patentee was not the applicant for patent (37 CFR 1.42), then a Statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is enclosed or was filed on _____. See 37 CFR 3.71.

☒ Attorney or agent of record. Registration Number 38918.

☐ Patent practitioner acting in a representative capacity whose correspondence address is the correspondence address of record. Notice has been given to the patentee or owner. Registration Number 38918.

Signature /Louis J. Hoffman/

**Typed or
Printed Name** Louis J. Hoffman

Date 10/22/2020

Telephone (480) 948-3295

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop Post Issue, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	40923325
Application Number:	12720362
International Application Number:	
Confirmation Number:	8899
Title of Invention:	SIGNAL COMPARISON-BASED LOCATION DETERMINING METHOD
First Named Inventor/Applicant Name:	Roy Shkedi
Customer Number:	26362
Filer:	Louis J. Hoffman/Donald Hertz
Filer Authorized By:	Louis J. Hoffman
Attorney Docket Number:	24-CON
Receipt Date:	22-OCT-2020
Filing Date:	09-MAR-2010
Time Stamp:	18:32:30
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Change of Address	20-10-22-Broadphone-USP8170583-COA.pdf	198979 c284477bca86e5b70dc4029597426d703b94ba26	no	1

Warnings:

Information:	
Total Files Size (in bytes):	198979
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.	

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

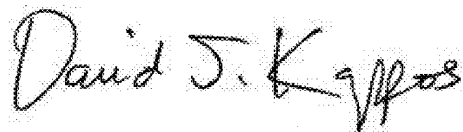
PATENT NO. : 8,170,583 B2
APPLICATION NO. : 12/720362
DATED : May 1, 2012
INVENTOR(S) : Roy Shkedi

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 26, Line 46, change "5" to --4--

Signed and Sealed this
Nineteenth Day of June, 2012

A handwritten signature in black ink, reading "David J. Kappos". The signature is written in a cursive, flowing style with a large initial "D" and a stylized "K".

David J. Kappos
Director of the United States Patent and Trademark Office

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor	Shkedi, Roy	Patent No.:	8,170,583
Application No.:	12/720,362	Issued:	May 1, 2012
Filed:	March 9, 2010	Conf. No.:	8899
Title:	Signal Comparison-Based Location Determining Method		

Attention: Certificate of Corrections Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR CERTIFICATE OF CORRECTION

Dear Sir:

Enclosed is a proposed Certificate of Correction, correcting an error made in the printing Claim 6 of this patent. [See the Examiner Amendment attached to the Notice of Allowance dated 3/20/12]

Because the error for which this Certificate of Correction is sought is due to a mistake on the part of the Office, no fee is due (35 U.S.C. § 254). Please send the issued Certificate to assignee's attorney at the below address.

Respectfully submitted,

ALMONDNET, INC.
by its attorney

Dated: May 10, 2012

/Louis J. Hoffman/
Louis J. Hoffman
Reg. No. 38,918

LOUIS J. HOFFMAN, P.C.
14301 North 87th Street, Suite 312
Scottsdale, Arizona 85260
(480) 948-3295

UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

Page 1 of 1

PATENT NO. : 8,170,583
APPLICATION NO.: 12/720,362
ISSUE DATE : May 1, 2012
INVENTOR(S) : Roy Shkedi

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 26, Line 46, change "5" to --4--

MAILING ADDRESS OF SENDER (Please do not use customer number below):

Louis J. Hoffman, P.C.
14301 North 87th Street, Suite 312
Scottsdale, Arizona 85260

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Electronic Acknowledgement Receipt	
EFS ID:	12747499
Application Number:	12720362
International Application Number:	
Confirmation Number:	8899
Title of Invention:	SIGNAL COMPARISON-BASED LOCATION DETERMINING METHOD
First Named Inventor/Applicant Name:	Roy Shkedi
Customer Number:	26362
Filer:	Louis J. Hoffman/Donald Hertz
Filer Authorized By:	Louis J. Hoffman
Attorney Docket Number:	24-CON
Receipt Date:	10-MAY-2012
Filing Date:	09-MAR-2010
Time Stamp:	13:22:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Certificate of Correction	12-05-10-Datronics-8170583-Req_C_of_C.pdf	56973 e2fd7af0dc136f8535451f361424c9eb9a45883d	no	1

Warnings:

Information:

2	Request for Certificate of Correction	12-05-10-Cert_of_Correction. pdf	30120 016cc6b2dbe943142f90f989e88fc388586d cf75	no	1
Warnings:					
Information:					
Total Files Size (in bytes):			87093		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					



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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/720,362	05/01/2012	8170583	24-CON	8899

26362 7590 04/11/2012
LOUIS J. HOFFMAN, P.C.
14301 North 87th Street, Suite 312
Scottsdale, AZ 85260

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Roy Shkedi, New York, NY;

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax **(571) 273-2885****

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

26362 7590 03/20/2012

LOUIS J. HOFFMAN, P.C.
14301 North 87th Street, Suite 312
Scottsdale, AZ 85260

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Certificate of Mailing or Transmission

FILED VIA E.F.S.

Donald Hertz	(Depositor's name)
/Donald Hertz/	(Signature)
03/28/2012	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/720,362	03/09/2010	Roy Shkedi	24-CON	8899

TITLE OF INVENTION:

SIGNAL COMPARISON-BASED LOCATION DETERMINING METHOD

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$870	\$300	\$1170	06/20/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
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PHUONG, DAI 2617 455-456100

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Louis J. Hoffman

2

3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

BROADPHONE, LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

NEW YORK, NEW YORK

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are enclosed:

- ☒ Issue Fee
- ☒ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s):

- ☐ A check in the amount of the fee(s) is enclosed.
- ☒ Payment by credit card.
- ☐ The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above. NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature /Louis J. Hoffman/

Date 03/28/2012

Typed or printed name Louis J. Hoffman

Registration No. 38,918

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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Electronic Patent Application Fee Transmittal				
Application Number:		12720362		
Filing Date:		09-Mar-2010		
Title of Invention:		SIGNAL COMPARISON-BASED LOCATION DETERMINING METHOD		
First Named Inventor/Applicant Name:		Roy Shkedi		
Filer:		Louis J. Hoffman/Donald Hertz		
Attorney Docket Number:		24-CON		
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	2501	1	870	870
Publ. Fee- early, voluntary, or normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1170

Electronic Acknowledgement Receipt	
EFS ID:	12416591
Application Number:	12720362
International Application Number:	
Confirmation Number:	8899
Title of Invention:	SIGNAL COMPARISON-BASED LOCATION DETERMINING METHOD
First Named Inventor/Applicant Name:	Roy Shkedi
Customer Number:	26362
Filer:	Louis J. Hoffman/Donald Hertz
Filer Authorized By:	Louis J. Hoffman
Attorney Docket Number:	24-CON
Receipt Date:	28-MAR-2012
Filing Date:	09-MAR-2010
Time Stamp:	17:19:39
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$1170
RAM confirmation Number	4528
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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1	Issue Fee Payment (PTO-85B)	12-03-28-Broadphone-CON- issue_fee_trans.pdf	34777 792d45845c93e138e6e72866c16a1e934ca 23973	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	31886 55672b2fe3b8f6b245f07a3ef644f5028655 22e	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			66663		
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UNITED STATES DEPARTMENT OF COMMERCE
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NOTICE OF ALLOWANCE AND FEE(S) DUE

26362 7590 03/20/2012
LOUIS J. HOFFMAN, P.C.
14301 North 87th Street, Suite 312
Scottsdale, AZ 85260

EXAMINER

PHUONG, DAI

ART UNIT

PAPER NUMBER

2617

DATE MAILED: 03/20/2012

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/720,362	03/09/2010	Roy Shkedi	24-CON	8899

TITLE OF INVENTION: SIGNAL COMPARISON-BASED LOCATION DETERMINING METHOD

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$870	\$300	\$0	\$1170	06/20/2012

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
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CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

26362 7590 03/20/2012
LOUIS J. HOFFMAN, P.C.
14301 North 87th Street, Suite 312
Scottsdale, AZ 85260

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/720,362	03/09/2010	Roy Shkedi	24-CON	8899

TITLE OF INVENTION: SIGNAL COMPARISON-BASED LOCATION DETERMINING METHOD

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	\$870	\$300	\$0	\$1170	06/20/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
PHUONG, DAI	2617	455-456100

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev. 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
 (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
 (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE _____ (B) RESIDENCE: (CITY and STATE OR COUNTRY) _____

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____
 Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/720,362	03/09/2010	Roy Shkedi	24-CON	8899

26362 7590 03/20/2012
LOUIS J. HOFFMAN, P.C.
14301 North 87th Street, Suite 312
Scottsdale, AZ 85260

EXAMINER

PHUONG, DAI

ART UNIT	PAPER NUMBER
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2617

DATE MAILED: 03/20/2012

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No.		Applicant(s)	
	12/720,362		SHKEDI, ROY	
	Examiner		Art Unit	
	DAI A. PHUONG		2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 02/23/12.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1,3-17,24-28,45 and 47-55.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____ .
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 * Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
 (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892) 2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948) 3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date ____ 4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material	5. ☐ Notice of Informal Patent Application 6. ☐ Interview Summary (PTO-413), Paper No./Mail Date ____ . 7. ☒ Examiner's Amendment/Comment 8. ☒ Examiner's Statement of Reasons for Allowance 9. ☐ Other ____ .
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/DAI A PHUONG/ Primary Examiner, Art Unit 2617	
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DETAILED ACTION

1. This Office Action is response to amendment filed on 02/23/2012.

Claims 2, 28-23, 29-44 and 46 have been canceled.

Claims 1, 3-17, 24-28, 45 and 47-55 are pending and allowed.

Examiner amendment

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Louis J. Hoffman on 02/29/2012

The application has been amended as follows:

In The Claim:

1. (~~Currently amended~~) A signal-comparison based location-determining method, operable by a first portable RF communications device in conjunction with ~~at least two~~ a plurality of fixed-location service-area antenna stations capable of RF communication with the first portable RF communications device wherein the antenna stations are substantially continuously operating, the method comprising ~~the step of:~~

(a) the first portable RF communications device monitoring its location by (i) receiving communications signals from a first plurality of ~~local fixed-location service area~~ the antenna stations, (ii) identifying at least one ID within at least one of the received communications signals, and (iii) measuring the signal strengths associated with a received communications signal from ~~at least two of said~~ the first plurality of antenna stations; and

(b) the first portable RF communication device determining if a monitored location is within proximity of a location chosen by a user of the first portable RF communication device, as a result of (i) electronically comparing the at least one ID and at least one figure based on the signal strengths of ~~at least two service~~ the first plurality of antenna stations at the monitored location with the at least one ID and the at least one figure based on signal strengths of the ~~at least two service~~ first plurality of antenna stations at the location chosen by the user, and (ii) determining if the difference between the signal strengths measured at the monitored location and the signal strengths at the location chosen by the user is less than a predetermined threshold.

2. (Canceled)

3. (Currently amended) The method of claim [[2]] 1 wherein the chosen location signal strengths were measured by the first portable RF communication device.

4. (Currently amended) The method of claim [[2]] 1 wherein the chosen location signal strengths were measured by a second portable RF communication device, different from the first portable RF communication device.

5. (Currently amended) The method of claim [[2]] 1 wherein the chosen location signal strengths and at least one ID originated from a database of geographic locations and corresponding signal strengths and IDs.

6. (Original) The method of claim 5 wherein the database is stored remotely, and not on the first portable RF communication device.

7. (Original) The method of claim 5 wherein the database is built by a service provider.

8. (Currently amended) The method of claim 5 wherein the database is built based on multiple locations, where for each location, GPS measurements and signal strength measurements are performed and the IDs of nearby ~~base~~ antenna stations of the plurality of antenna stations are recognized.

9. (Original) The method of claim 8 wherein at least for some of the locations, signal strength measurements are taken at different times.

10. (Original) The method of claim 8 wherein the signal strength measurements are taken using a portable RF communication device.

11. (Currently amended) The method of claim 10 wherein the signal strength measurements or calculation results made using the signal strength measurements, along with the ~~base~~ antenna station IDs, are sent by the portable RF communication device to a server responsible for building the database of geographic locations and corresponding signal strengths and ~~base~~ antenna stations IDs.

12. (Previously presented) The method of claim 5 wherein the chosen location signal strengths and at least one ID is taken from the database of geographic locations and corresponding signal strengths and IDs using a geographic location entered by the first portable RF communication device user as the location chosen by the user.

13. (Previously presented) The method of claim 5 wherein the chosen location signal strengths and at least one ID, which corresponds with a geographical location chosen by the first portable RF communication device user, is the result of extrapolating the signal strengths of locations in the database of geographic locations and corresponding signal strengths and IDs.

14. (Previously presented) The method of claim 5 wherein the chosen location signal strengths and at least one ID, which corresponds with a geographical location chosen by the first portable RF communication device user, is taken from the database of geographic locations and corresponding signal strengths and IDs, said database being built using computational closure.

15. (Original) The method of claim 1 wherein the at least one ID is a cell ID.

16. (Original) The method of claim 1 wherein the first portable RF communication device is a mobile phone.

17. (Original) The method of claim 1 wherein the first portable RF communication device is a ubiquitous computer.

18.-23. (Canceled)

24. (Original) The method of claim 1 wherein the monitoring step comprises 'low accuracy monitoring' and 'high accuracy monitoring'.

25. (Previously presented) The method of claim 24 wherein 'low accuracy monitoring' includes comparing the chosen location IDs with the current location IDs.

26. (Previously presented) The method of claim 25 wherein 'high accuracy monitoring' takes place only if the current location IDs are determined to match the chosen location IDs in the 'low accuracy monitoring' step.

27. (Previously presented) The method of claim 26 wherein 'high accuracy monitoring' includes measuring a signal strength at the current location.

28. (Original) The method of claim 1 wherein the monitoring step is performed iteratively, with a predetermined time delay between successive iterations such that data from the monitoring step is used only if a substantial portion of the successive measurements are alike within a predetermined threshold.

29.-44. (Canceled)

45. (Currently amended) A signal-comparison based location-determining system, comprising:

(a) a first portable RF communications device communicating with ~~at least two~~ a plurality of fixed-location service-area antenna stations capable of RF communication with the first portable RF communications device, wherein the antenna stations are substantially continuously operating;

(b) software residing on the first portable RF communications device, said software causing the first portable RF communications device to monitor its

location by (i) receiving communications signals from a first plurality of ~~local fixed location service area~~ the antenna stations, (ii) identifying at least one ID within at least one of the received communications signals, and (iii) measuring signal strengths associated with a received communications signal from ~~at least two of the first plurality of antenna stations;~~ and

(c) software residing on the first portable RF communication device, said software causing the first portable RF communication device to determine if the monitored location is within proximity of a location chosen by a user of the first portable RF communication device, as a result of (i) electronically comparing the at least one ID and at least one figure based on the signal strengths of ~~at least two service~~ the first plurality of antenna stations at the monitored location with the at least one ID and at least one figure based on signal strengths of the ~~at least two service~~ first plurality of antenna stations at the location chosen by the user, and (ii) determining if the difference between the signal strengths measured at the monitored location and the signal strengths at the location chosen by the user is less than a predetermined threshold.

46. (Canceled)

47. (Currently amended) The method of claim 1 wherein the 'at least one figure based on the signal strengths' is the signal strengths, for both the monitored location and the chosen location.

48. (Currently amended) The method of claim 1 wherein the 'at least one figure based on the signal strengths of ~~at least two service~~ the first plurality of antenna stations' is a figure based on a calculation using the signal strengths of ~~at least two service~~ the first plurality of antenna stations.

49. (Previously presented) The method of claim 1 wherein determining if the monitored location is within proximity of a location chosen by the user of the first portable RF communication device further includes informing a location-based

software program application running on the portable device that the device is at the location chosen by the user or is no longer at the location chosen by the user.

50. (Previously presented) The method of claim 1 wherein determining if the monitored location is within proximity of a location chosen by the user of the first portable RF communication device further includes launching a location-based software program application on the portable device when the device is at the location chosen by the user.

51. (Previously presented) The method of claim 1 wherein the determining of part (b) starts taking place or stops taking place at one or more of the following: (i) at specific time intervals, or (ii) at specific times, or (iii) depending on the rate the user's location changes, or (iv) at the occurrence of an event, or (v) upon a request from the network, or (vi) upon a request from a software application on the device, or (vii) upon a request from the user.

52. (Currently amended) The method of claim 51 wherein the determining of part (b) starts taking place or stops taking place at the occurrence of an event, and wherein the event is the device switching from one to another of the base antenna stations with which it is registered.

53. (Currently amended) The method of claim 52 wherein the ~~base antenna station~~ with which the device is registered is a cell base station.

54. (Currently amended) The method of claim 52 wherein the ~~base antenna station~~ with which the device is registered is a WiFi base station.

55. (Previously presented) The method of claim 1 wherein the at least one ID is a WiFi network ID.

(End of Amendment)

Allowable Subject Matter

3. Claims 1, 3-17, 24-28, 45 and 47-55 are allowed.

The following is an examiner's statement of reasons for allowance: the prior art of record does not teach or fairly suggest that the first portable RF communication device determining if a monitored location is within proximity of a location chosen by a user of the first portable RF communication device, as a result of (i) electronically comparing the at least one ID and at least one figure based on the signal strengths of the first plurality of antenna stations at the monitored location with the at least one ID and the at least one figure based on signal strengths of the first plurality of antenna stations at the location chosen by the user, and (ii) determining if the difference between the signal strengths measured at the monitored location and the signal strengths at the location chosen by the user is less than a predetermined threshold, as recited in claims 1 and 45.

4. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submission should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dai A Phuong whose telephone number is 571-272-7896. The examiner can normally be reached on Monday to Friday, 9:00 A.M. to 5:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on 571-272-7603. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 12/720,362
Art Unit: 2617

Page 9

/Dai A Phuong/
Examiner, Art Unit 2617
Date: 3/01/2012

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Shkedi, Roy	Art Unit	:	2617
Serial No.	:	12/720,362	Examiner	:	Phuong, Dai
Filing Date	:	03/09/2010	Conf. No.	:	8899
Title	:	Signal Comparison-Based Location Determining Method			

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Filed via EFS – February 23, 2012
After Final - Expedited Treatment Requested

RESPONSE TO FINAL OFFICE ACTION

Dear Sir:

In response to the Office Action dated September 23, 2011, which has been made final, assignee requests entry of the following amendments and consideration of the following remarks.

Amendments to the claims begin on page 2. OK TO ENTER: /D.P./

Remarks begin on page 7.

The application as amended now includes thirty-one (31) claims, two (2) of which are independent claims. Assignee has previously paid for forty-six (46) total claims and four (4) independent claims. Accordingly, no excess claims fees are due.

A shortened statutory period for reply expired on December 23, 2011. Accordingly, this amendment is filed with a request for a two-month extension of time and the corresponding fee.

Search Notes 	Application/Control No. 12720362	Applicant(s)/Patent Under Reexamination SHKEDI, ROY
	Examiner DAI A PHUONG	Art Unit 2617

SEARCHED			
Class	Subclass	Date	Examiner
455	432.1-442, 456.1-456.3	3/24/11	ad
	East search updated	09/15/11	ad
	East search updated	3/01/12	ad

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor Search	3/24/11	ad
Inventor search updated	09/15/2011	ad
Inventor search updated	3/01/12	ad

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
	Please see printout	3/1/12	ad

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<i>Index of Claims</i> 	Application/Control No. 12720362	Applicant(s)/Patent Under Reexamination SHKEDI, ROY
	Examiner DAI A PHUONG	Art Unit 2617

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant				☐ CPA		☐ T.D.		☐ R.1.47	
CLAIM		DATE							
Final	Original	09/15/2011	03/01/2012						
1	1	✓	=						
-	2	✓	-						
2	3	✓	=						
3	4	✓	=						
4	5	✓	=						
5	6	✓	=						
6	7	✓	=						
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<i>Index of Claims</i> 	Application/Control No. 12720362	Applicant(s)/Patent Under Reexamination SHKEDI, ROY
	Examiner DAI A PHUONG	Art Unit 2617

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant										☐ CPA										☐ T.D.										☐ R.1.47									
CLAIM		DATE																																					
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31	45	✓	=																																				
-	46	-	-																																				
22	47	✓	=																																				
23	48	✓	=																																				
24	49	✓	=																																				
25	50	✓	=																																				
26	51	✓	=																																				
27	52	✓	=																																				
28	53	✓	=																																				
29	54	✓	=																																				
30	55	✓	=																																				

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1	12/720362	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/01 12:34
L2	1	(station\$4 and (id identif\$8) and (signal\$4 near4 strength\$4) and ((less small\$4) near4 (threshold\$4 predetermin\$4 level)) and figur\$4 and ((locat\$4 position\$4 area) near4 chos\$4)).clm.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/01 12:45
S1	33383547	@ad<="20060919" or @rlad<="20060919" or @ptad<="20060919" or @pt1d<="20060919" or @pt3d<="20060919"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 07:21
S2	2	"20090031006"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 07:23
S3	1	12/122619	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 11:03
S4	2	"7057556".pn.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 11:48
S5	2	"7050786".pn.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 11:49
S6	2	"6972717".pn.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 11:54
S7	0	"200900031006"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 11:55
S8	2	"20090031006"	US-PGPUB; USPAT; EPO; JPO; DERWENT;	OR	ON	2011/03/24 11:55

			IBM_TDB			
S9	3	"20070232322"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 11:55
S10	2	"20080039114"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 12:04
S11	3406	((cell (base near3 station) bs) near4 (id identity identifi\$8)) with (table referenc\$4) with (locat\$4 position\$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 12:20
S12	197	((cell (base near3 station) bs) near4 (id identity identifi\$8)) with (table referenc\$4) with (within near5 (proximity range locat\$4 position\$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 12:21
S13	0	S3 and S12	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 12:23
S14	33383547	@ad<="20060919" or @rlad<="20060919" or @ptad<="20060919" or @pt1d<="20060919" or @pt3d<="20060919"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 12:23
S15	163	S12 and S14	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 12:24
S16	6	"7706975".pn.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 12:29
S17	1	12/720362	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 12:41
S18	2	"20080039114"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 12:44
S19	33383547	@ad<="20060919" or @rlad<="20060919" or @ptad<="20060919" or @pt1d<="20060919" or @pt3d<="20060919"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 14:16
S20	0	(via near5 (second near3 (mobile \$phone pda portable))) with (table referenc\$4) with (within near5 (proximity range locat\$4 position\$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT;	OR	ON	2011/03/24 14:17

			IBM_TDB			
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S22	36	((second near3 (mobile \$phone pda portable))) with (measur\$4) with (within near5 (proximity range locat\$4 position\$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 14:18
S23	25	S19 and S22	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 14:18
S24	62	((second near3 (mobile \$phone pda portable))) near12 (measur\$4) with ((determin\$4 comput\$4) near5 (proximity range locat\$4 position\$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 14:22
S25	53	S19 and S24	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 14:23
S26	7	"7706811".pn.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 15:03
S27	39	(SHKEDI near2 ROY).in.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 15:29
S28	8	(SHKEDI near2 ROY).in. and (id).clm.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 15:30
S29	3	(SHKEDI near2 ROY).in. and (rf same locat\$4).clm.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 15:31
S30	33453743	@ad<="20060919" or @rlad<="20060919" or @ptad<="20060919" or @pt1d<="20060919" or @pt3d<="20060919"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/09/15 16:13
S31	3	(SHKEDI near2 ROY).in. and ((locat\$4 position\$4) same id).clm.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/09/15 16:14
S32	150	((cell (base near3 station\$4) (access near3 point\$4)) near4 (id identity identif\$6)) same (interest\$4 near4 (locat\$4 position\$4 area point\$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT;	OR	ON	2011/09/15 16:16

		same (match\$4 compar\$4)	IBM_TDB			
S33	121	S30 and S32	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/09/15 16:17
S34	6752	((select\$4 chos\$4) near4 (locat\$4 position\$4 area)) same (within range proximity) same ((current\$4 monitor\$4) near4 (locat\$4 position\$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/01 11:12
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S37	437	S34 and S36	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/01 11:13
S38	15	((select\$4 chos\$4) near4 (locat\$4 position\$4 area)) same (within range proximity) same ((current\$4 monitor\$4) near4 (locat\$4 position\$4)) same ((base near3 station\$4) cell) same ((compar\$4 less more than greater) near12 (threshold level predetermin\$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/01 11:14
S39	13	S35 and S38	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/01 11:15
S40	7	"7706811".pn.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/01 11:26
S41	596	((current\$4 monitor\$4 select\$4 chos\$4) near4 (locat\$4 position\$4 area)) same (within range) same ((base near3 station\$4) cell) same ((compar\$4 less more than greater) near12 (threshold level predetermin\$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/01 11:36
S42	177428	"455"/\$.cls.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/01 11:37
S43	586	S34 and S42	US-PGPUB; USPAT; EPO; JPO;	OR	ON	2012/03/01 11:37

			DERWENT; IBM_TDB			
S44	11	S41 and S43	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/01 11:38
S45	2	(SHKEDI near2 ROY).in. and ((compar\$4 less more than greater) near12 (threshold level predetermin\$4)).clm.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/01 11:53
S46	14	(SHKEDI near2 ROY).in. and (location\$4 position\$4 area proximit\$4).clm.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2012/03/01 11:54

3/ 1/ 2012 12:46:42 PM

C:\Users\dphuong\Documents\EAST\Workspaces\12720362.wsp

Issue Classification 	Application/Control No. 12720362	Applicant(s)/Patent Under Reexamination SHKEDI, ROY
	Examiner DAI A PHUONG	Art Unit 2617

ORIGINAL						INTERNATIONAL CLASSIFICATION													
CLASS		SUBCLASS				CLAIMED					NON-CLAIMED								
455		456.1				H	0	4	W	24 / 00 (2009.01.01)									
CROSS REFERENCE(S)																			
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)																		
455	404.1	404.2	433	440	457														
370	328	331	332	333	334														
					</														

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	16	17	-	33	24	49								
-	2	-	18	-	34	25	50								
2	3	-	19	-	35	26	51								
3	4	-	20	-	36	27	52								
4	5	-	21	-	37	28	53								
5	6	-	22	-	38	29	54								
6	7	-	23	-	39	30	55								
7	8	17	24	-	40										
8	9	18	25	-	41										
9	10	19	26	-	42										
10	11	20	27	-	43										
11	12	21	28	-	44										
12	13	-	29	31	45										
13	14	-	30	-	46										
14	15	-	31	22	47										
15	16	-	32	23	48										

NONE		Total Claims Allowed:	
		30	
(Assistant Examiner)	(Date)		
/DAI A PHUONG/ Primary Examiner.Art Unit 2617	3/01/12	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/720,362	03/09/2010	Roy Shkedi	24-CON	8899

26362	7590	02/28/2012
LOUIS J. HOFFMAN, P.C. 14301 North 87th Street, Suite 312 Scottsdale, AZ 85260		

EXAMINER	
PHUONG, DAI	

ART UNIT	PAPER NUMBER
2617	

NOTIFICATION DATE	DELIVERY MODE
02/28/2012	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Louis@valuablepatents.com
donald@valuablepatents.com
shaelyn@valuablepatents.com

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews

Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Shkedi, Roy	Art Unit	:	2617
Serial No.	:	12/720,362	Examiner	:	Phuong, Dai
Filing Date	:	03/09/2010	Conf. No.	:	8899
Title	:	Signal Comparison-Based Location Determining Method			

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Filed via EFS – February 23, 2012
After Final - Expedited Treatment Requested

RESPONSE TO FINAL OFFICE ACTION

Dear Sir:

In response to the Office Action dated September 23, 2011, which has been made final, assignee requests entry of the following amendments and consideration of the following remarks.

Amendments to the claims begin on page 2.

Remarks begin on page 7.

The application as amended now includes thirty-one (31) claims, two (2) of which are independent claims. Assignee has previously paid for forty-six (46) total claims and four (4) independent claims. Accordingly, no excess claims fees are due.

A shortened statutory period for reply expired on December 23, 2011. Accordingly, this amendment is filed with a request for a two-month extension of time and the corresponding fee.

Amendments

IN THE CLAIMS:

Please amend the claims as follows:

1. (Currently amended) A signal-comparison based location-determining method, operable by a first portable RF communications device in conjunction with at least two fixed location service-area antenna stations capable of RF communication with the first portable RF communications device wherein the stations are substantially continuously operating, the method comprising ~~the steps of:~~

(a) the first portable RF communications device monitoring its location by (i) receiving communications signals from a first plurality of local fixed-location service-area antenna stations, (ii) identifying at least one ID within at least one of the received communications signals, and (iii) measuring ~~[[a]] the signal characteristic strengths~~ associated with a received communications signal from at least two of said first plurality of antenna stations; and

(b) the first portable RF communication device determining if a monitored location is within proximity ~~[[to]] of~~ a location chosen by a user of the first portable RF communication device, as a result of (i) electronically comparing the at least one ID and at least one figure based on the signal ~~characteristic strengths~~ of at least two service antenna stations at the monitored location with the at least one ID and the at least one figure based on ~~the signal characteristic strengths~~ of the at least two service antenna stations at the ~~chosen~~ location chosen by the user, and (ii) determining if the difference between the signal strengths measured at the monitored location and the signal strengths at the location chosen by the user is less than a predetermined threshold.

2. (Canceled)

3. (Currently amended) The method of claim ~~[[2]] 1~~ wherein the chosen location signal strengths were measured by the first portable RF communication device.

4. (Currently amended) The method of claim ~~[[2]] 1~~ wherein the chosen location signal strengths were measured by a second portable RF communication device, different from the first portable RF communication device.

5. (Currently amended) The method of claim [[2]] 1 wherein the chosen location signal strengths and at least one ID originated from a database of geographic locations and corresponding signal strengths and IDs.

6. (Original) The method of claim 5 wherein the database is stored remotely, and not on the first portable RF communication device.

7. (Original) The method of claim 5 wherein the database is built by a service provider.

8. (Previously presented) The method of claim 5 wherein the database is built based on multiple locations, where for each location, GPS measurements and signal strength measurements are performed and the IDs of nearby base stations are recognized.

9. (Original) The method of claim 8 wherein at least for some of the locations, signal strength measurements are taken at different times.

10. (Original) The method of claim 8 wherein the signal strength measurements are taken using a portable RF communication device.

11. (Previously presented) The method of claim 10 wherein the signal strength measurements or calculation results made using the signal strength measurements, along with the base station IDs, are sent by the portable RF communication device to a server responsible for building the database of geographic locations and corresponding signal strengths and base stations IDs.

12. (Currently amended) The method of claim 5 wherein the chosen location signal strengths and at least one ID is taken from the database of geographic locations and corresponding signal strengths and IDs using a geographic location entered by the first portable RF communication device user as [[his]] the location chosen ~~location by the user~~.

13. (Previously presented) The method of claim 5 wherein the chosen location signal strengths and at least one ID, which corresponds with a geographical location chosen by the first portable RF communication device user, is the result of extrapolating the signal strengths of locations in the database of geographic locations and corresponding signal strengths and IDs.

14. (Previously presented) The method of claim 5 wherein the chosen location signal strengths and at least one ID, which corresponds with a geographical location chosen by the first portable RF communication device user, is taken from the database of geographic locations and corresponding signal strengths and IDs, said database being built using computational closure.

15. (Original) The method of claim 1 wherein the at least one ID is a cell ID.

16. (Original) The method of claim 1 wherein the first portable RF communication device is a mobile phone.

17. (Original) The method of claim 1 wherein the first portable RF communication device is a ubiquitous computer.

18.-23. (Canceled)

24. (Original) The method of claim 1 wherein the monitoring step comprises 'low accuracy monitoring' and 'high accuracy monitoring'.

25. (Currently amended) The method of claim 24 wherein 'low accuracy monitoring' includes comparing the ~~IDs of the~~ chosen location IDs with the ~~IDs of the~~ current location IDs.

26. (Currently amended) The method of claim 25 wherein 'high accuracy monitoring' takes place only if ~~IDs of the~~ current location IDs are determined to match ~~IDs of the~~ chosen location IDs in the 'low accuracy monitoring' step.

27. (Currently amended) The method of claim 26 wherein 'high accuracy monitoring' includes measuring a signal ~~characteristic~~ strength at the current location.

28. (Original) The method of claim 1 wherein the monitoring step is performed iteratively, with a predetermined time delay between successive iterations such that data from the monitoring step is used only if a substantial portion of the successive measurements are alike within a predetermined threshold.

29.-44. (Canceled)

45. (Currently amended) A signal-comparison based location-determining system, comprising:

(a) a first portable RF communications device communicating with at least two fixed location service-area antenna stations capable of RF communication with the first portable RF communications device, wherein the antenna stations are substantially continuously operating;

(b) software residing on the first portable RF communications device, said software causing the first portable RF communications device to monitor its location by (i) receiving communications signals from a first plurality of local fixed-location service-area antenna stations, (ii) identifying at least one ID within at least one of the received communications signals, and (iii) measuring ~~[[a]]~~ signal characteristic strengths associated with a received communications signal from at least two of ~~said the~~ first plurality of antenna stations; and

(c) software residing on the first portable RF communication device, said software causing the first portable RF communication device to determine if the monitored location is within proximity ~~[[to]]~~ of a location chosen by a user of the first portable RF communication device, as a result of (i) electronically comparing the at least one ID and at least one figure based on the signal ~~characteristic strengths~~ characteristic strengths of at least two service antenna stations at the monitored location with the at least one ID and at least one figure based on ~~the~~ signal ~~characteristic strengths~~ characteristic strengths of ~~the~~ at least two service antenna stations at the ~~chosen~~ location chosen by the user, and (ii) determining if the difference between the signal strengths measured at the monitored location and the signal strengths at the location chosen by the user is less than a predetermined threshold.

46. (Canceled)

47. (Currently amended) The method of claim ~~[[2]]~~ 1 wherein the 'at least one figure based on the signal ~~characteristic strength~~' is the signal ~~characteristic strengths~~, for both the monitored location and the chosen location.

48. (Currently amended) The method of claim ~~[[2]]~~ 1 wherein the 'at least one figure based on the signal ~~characteristic strength~~ of at least two service antenna stations' is a figure based on a calculation using the signal ~~characteristic strengths~~ of at least two service antenna stations.

49. (Currently amended) The method of claim 1 wherein determining if the monitored location is within proximity ~~[[to]]~~ of a location chosen by ~~[[a]]~~ the user of the first portable RF communication device further includes informing a location-based software program application running on the portable device that the device is at the ~~chosen~~ location chosen by the user or is no longer at the ~~chosen~~ location chosen by the user.

50. (Currently amended) The method of claim 1 wherein determining if the monitored location is within proximity ~~[[to]]~~ of a location chosen by ~~[[a]]~~ the user of the first portable RF communication device further includes launching a location-based software program application on the portable device when the device is at the ~~chosen~~ location chosen by the user.

51. (Currently amended) The method of claim 1 wherein the determining of part (b) starts taking place or stops taking place at one or more of the following: (i) at specific time intervals, or (ii) at specific times, or (iii) depending on the rate the user's location changes, or (iv) at the occurrence of an event, or (v) upon a request from the network, or (vi) upon a request from a software application on the device, or (vii) upon a request from the user.

52. (Currently amended) The method of claim 51 wherein ~~[[an]]~~ the event is the device switching the base station with which it is registered ~~with~~.

53. (Previously presented) The method of claim 52 wherein the base station is a cell base station.

54. (Previously presented) The method of claim 52 wherein the base station is a WiFi base station.

55. (Previously presented) The method of claim 1 wherein the at least one ID is a WiFi network ID.

Remarks

1. Interview Summary

Assignee's undersigned attorney thanks the examiner for the telephone interview begun on January 26 and concluded February 22, 2012. The Office Action identified claim 29 as allowable if rewritten in independent form. Assignee suggested certain clarifying amendments and argued that independent claim 1 contained essentially the same distinction from the cited reference (Huomo) as the dependent claim 29. The examiner concluded that (1) at least some of the clarifying amendments, if presented, would introduce new issues requiring further study and would be unsuited for entry after final, and (2) without the clarifying amendments, based on a broad interpretation of the word "figure," an argument had been constructed that the Huomo reference rendered claim 1 unpatentable. Assignee's representative disagreed but respected the examiner's opinion and appreciated the courtesy of a clear reply. There appeared to be no dispute between the examiner and the undersigned about what Huomo disclosed and did not disclose. The undersigned promised to file a response (this one) after consulting the client, taking into account the examiner's thoughts. The examiner promised to consider the question of patentability of claim 1, or a clarified variation of claim 1, with a fresh mind, in the context of a continuation, if assignee elected to file one.

2. Summary of Amendments.

Assignee has elected to accept the examiner's allowance of claim 29 in this application and pursue claim 1, with certain clarifying changes, through a planned continuation. Accordingly, assignee has incorporated the limitations of allowable dependent claim 29 and intervening claim 2, in full, into independent base claim 1 and canceled dependent claims 2 and 29. Assignee has made parallel modifications to the other independent claim, namely claim 45. Assignee has made a number of further changes, but solely to correct or improve grammar, to conform the wording to that used in former dependent claim 29, or to avoid minor informalities, such as antecedent basis or parallelism of terminology. Finally, assignee canceled a few claims no longer needed.

3. Conclusion.

The Office already determined the subject matter of these claims is allowable. With these amendments, this application is in condition for allowance, so prompt issuance of a notice of allowance is respectfully solicited.

Please feel free to telephone the undersigned if anything further is required to advance prosecution of this application.

Respectfully submitted,
BROADPHONE, LLC
by its attorney

Dated: February 23, 2012

/Louis J. Hoffman/
Louis J. Hoffman
Reg. No. 38,918

LOUIS J. HOFFMAN, P.C.
14301 North 87th Street
Suite 312
Scottsdale, Arizona 85260
(480) 948-3295

Electronic Patent Application Fee Transmittal				
Application Number:		12720362		
Filing Date:		09-Mar-2010		
Title of Invention:		Signal Comparison-Based Location Determining Method		
First Named Inventor/Applicant Name:		Roy Shkedi		
Filer:		Louis J. Hoffman/Donald Hertz		
Attorney Docket Number:		24-CON		
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 2 months with \$0 paid	2252	1	280	280

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				280

Electronic Acknowledgement Receipt	
EFS ID:	12148917
Application Number:	12720362
International Application Number:	
Confirmation Number:	8899
Title of Invention:	Signal Comparison-Based Location Determining Method
First Named Inventor/Applicant Name:	Roy Shkedi
Customer Number:	26362
Filer:	Louis J. Hoffman/Donald Hertz
Filer Authorized By:	Louis J. Hoffman
Attorney Docket Number:	24-CON
Receipt Date:	23-FEB-2012
Filing Date:	09-MAR-2010
Time Stamp:	20:32:47
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$280
RAM confirmation Number	6803
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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1	Amendment After Final	12-02-23-Broadphone-CON-RTOAF.pdf	44759 307bdaa8eb773e9bb847b12a69d724ea11e5ed70	no	8
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30552 658dd4619730fe4dafc3342f1e9f9e3e7d354a04	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			75311		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 12/720,362		Filing Date 03/09/2010		☐ To be Mailed		
APPLICATION AS FILED – PART I											
(Column 1)			(Column 2)		SMALL ENTITY ☒ OR		OTHER THAN SMALL ENTITY				
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)				
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A					
☐ SEARCH FEE (37 CFR 1.16(k), (j), or (m))	N/A	N/A	N/A			N/A					
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A					
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$ =		OR	X \$ =					
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =			X \$ =					
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).										
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))											
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL					
APPLICATION AS AMENDED – PART II											
(Column 1)			(Column 2)		(Column 3)		SMALL ENTITY OR		OTHER THAN SMALL ENTITY		
AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)			
	Total (37 CFR 1.16(i))	Minus	**	=	X \$ =	OR	X \$ =				
	Independent (37 CFR 1.16(h))	Minus	***	=	X \$ =	OR	X \$ =				
	☐ Application Size Fee (37 CFR 1.16(s))										
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
			TOTAL ADD'L FEE			OR	TOTAL ADD'L FEE				
(Column 1)			(Column 2)		(Column 3)		SMALL ENTITY OR		OTHER THAN SMALL ENTITY		
AMENDMENT	02/23/2012	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)		
	Total (37 CFR 1.16(i))	* 31	Minus	** 46	= 0	X \$30 =	0	OR	X \$ =		
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0	X \$125 =	0	OR	X \$ =		
	☐ Application Size Fee (37 CFR 1.16(s))										
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
			TOTAL ADD'L FEE	0		OR	TOTAL ADD'L FEE				
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.											

Legal Instrument Examiner:
/C. Dessau/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Applicant Initiated Interview Request Form

Application No.: 12/720,362 First Named Applicant: Shkedi, Roy
 Examiner: Phuong, Dai Art Unit: 2617 Status of Application: After Final Office Action

Tentative Participants:

(1) Examiner Phuong (2) Louis Hoffman
 (3) _____ (4) _____

Proposed Date of Interview: 01/26/2012 Proposed Time: 11:00 (EST)
 (AM/PM)

Type of Interview Requested:

(1) ☒ Telephonic (2) ☐ Personal (3) ☐ Video Conference

Exhibit To Be Shown or Demonstrated: ☐ YES ☒ NO

If yes, provide brief description: _____

Issues To Be Discussed

Issues (Rej., Obj., etc)	Claims/ Fig. #s	Prior Art	Discussed	Agreed	Not Agreed
(1) <u>Rej./Obj.</u>	<u>1, 2, 29</u>	<u>Huomo</u>	☐	☐	☐
(2) _____	_____	_____	☐	☐	☐
(3) _____	_____	_____	☐	☐	☐
(4) _____	_____	_____	☐	☐	☐

☐ Continuation Sheet Attached ☐ Proposed Amendment or Arguments Attached

Brief Description of Arguments to be Presented: Agenda: Need to discuss which claim language captures the distinction in the Final Office Action between Huomo and the subject matter indicated allowable.

An interview was conducted on the above-identified application on _____

NOTE: This form should be completed and filed by applicant in advance of the interview (see MPEP § 713.01). If this form is signed by a registered practitioner not of record, the Office will accept this as an indication that he or she is authorized to conduct an interview on behalf of the principal (37 CFR 1.32(a)(3)) pursuant to 37 CFR 1.34. This is not a power of attorney to any above named practitioner. See the Instruction Sheet for this form, which is incorporated by reference. By signing this form, applicant or practitioner is certifying that he or she has read the Instruction Sheet. After the interview is conducted, applicant is advised to file a statement of the substance of this interview (37 CFR 1.133(b)) as soon as possible. This application will not be delayed from issue because of applicant's failure to submit a written record of this interview.

/Louis J. Hoffman/

Applicant/Applicant's Representative Signature

Louis J. Hoffman

Typed/Printed Name of Applicant or Representative

38,918

Registration Number, if applicable

Examiner/SPE Signature

This collection of information is required by 37 CFR 1.133. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 24 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt	
EFS ID:	11922706
Application Number:	12720362
International Application Number:	
Confirmation Number:	8899
Title of Invention:	Signal Comparison-Based Location Determining Method
First Named Inventor/Applicant Name:	Roy Shkedi
Customer Number:	26362
Filer:	Louis J. Hoffman/Donald Hertz
Filer Authorized By:	Louis J. Hoffman
Attorney Docket Number:	24-CON
Receipt Date:	25-JAN-2012
Filing Date:	09-MAR-2010
Time Stamp:	20:10:36
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Letter Requesting Interview with Examiner	12-01-25-Broadphone-12720362- lview_Rqst-File.pdf	143950 5904fa64936886797d0ab0d4610582731e323bf	no	1

Warnings:

Information:

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/720,362	03/09/2010	Roy Shkedi	B030910

24271
JOHN ALEXANDER GALBREATH
2516 CHESTNUT WOODS CT
REISTERSTOWN, MD 21136

CONFIRMATION NO. 8899
POWER OF ATTORNEY NOTICE



Date Mailed: 12/06/2011

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 11/22/2011.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/hsarwari/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/720,362	03/09/2010	Roy Shkedi	24-CON

26362
LOUIS J. HOFFMAN, P.C.
11811 North Tatum Boulevard, Suite 2100
Phoenix, AZ 85028

CONFIRMATION NO. 8899
POA ACCEPTANCE LETTER



Date Mailed: 12/06/2011

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 11/22/2011.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/hsarwari/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS	Application Number	12/720,362
	Filing Date	03/09/2010
	First Named Inventor	Shkedi, Roy
	Title	Signal comparison-based location...
	Art Unit	2617
	Examiner Name	Phuong, Dai
	Attorney Docket Number	24-CON

I hereby revoke all previous powers of attorney given in the above-identified application.

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

26362

OR

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

Practitioner(s) Name	Registration Number

Please recognize or change the correspondence address for the above-identified application to:

☒ The address associated with the above-mentioned Customer Number.

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name

Address

City State Zip

Country

Telephone Email

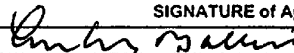
I am the:

☐ Applicant/Inventor.

OR

☒ Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) (Form PTO/SB/96) submitted herewith or filed on _____

SIGNATURE of Applicant or Assignee of Record

Signature		Date	November 21, 2011
Name	Aubrey Balkind	Telephone	(212) 965-0099
Title and Company	Broadphone, LLC by its CEO		

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt	
EFS ID:	11470580
Application Number:	12720362
International Application Number:	
Confirmation Number:	8899
Title of Invention:	Signal Comparison-Based Location Determining Method
First Named Inventor/Applicant Name:	Roy Shkedi
Customer Number:	24271
Filer:	Louis J. Hoffman/Donald Hertz
Filer Authorized By:	Louis J. Hoffman
Attorney Docket Number:	B030910
Receipt Date:	22-NOV-2011
Filing Date:	09-MAR-2010
Time Stamp:	20:32:46
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Assignee showing of ownership per 37 CFR 3.73(b).	11-11-21-Broadphone-12720362-Owner_Stmt-signed.pdf	187692 4660d6ef9b6c16cd400be6e1bd6d23597995371c	no	1

Warnings:

Information:

2	Power of Attorney	11-11-21- Broadphone-12720362-POA- signed.pdf	171896 8c332e674312c713eddd528f88b7bbdb92x 151b1	no	1
Warnings:					
Information:					
Total Files Size (in bytes):			359588		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: BROADPHONE, LLC

Application No./Patent No.: 12/720,362

Filed/Issue Date: 03/09/2010

Titled: Signal comparison-based location determining method

BROADPHONE, LLC

, a Delaware limited liability company

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;
2. ☐ an assignee of less than the entire right, title, and interest in
(The extent (by percentage) of its ownership interest is _____ %); or
3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 027119, Frame 0339, or for which a copy therefore is attached.

OR

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Aubrey Balkind
Signature

November 21, 2011

Date

Aubrey Balkind

CEO

Printed or Typed Name

Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/720,362	03/09/2010	Roy Shkedi	B030910	8899
24271 7590 09/23/2011 JOHN ALEXANDER GALBREATH 2516 CHESTNUT WOODS CT REISTERSTOWN, MD 21136			EXAMINER PHUONG, DAI	
			ART UNIT 2617	PAPER NUMBER
			MAIL DATE 09/23/2011	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	12/720,362	SHKEDI, ROY	
	Examiner	Art Unit	
	DAI A. PHUONG	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17, 22-29, 35-45 and 47-55 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17, 22-28, 35-45 and 47-55 is/are rejected.
- 7) ☒ Claim(s) 29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 March 2010 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) ☒ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413) |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) ☒ Information Disclosure Statement(s) (PTO/SB/08) | 5) ☐ Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) ☐ Other: _____ |

DETAILED ACTION

1. This Office Action is response to Amendment filed on 06/28/2011
Claims 18-21, 30-44 and 46 are canceled.
Claims 47-55 have been added.
Claims 1-17, 22-29, 35-45 and 47-55 are pending.

Double Patenting

2. Terminal disclaimer filed on 06/28/2011

Response to Argument

3. Applicant's arguments, filed 09/19/2011, with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

Information Disclosure Statement

4. The references listed in the Information Disclosure Statement filed on 06/03/2011 have been considered by the examiner (see attached PTO-1449 form or PTO/SB/08A and 08B).

Claim Objections

5. Claims 1 and 45 are objected to because of the following informalities:

Regarding claims 1 and 45, lines 16-17 recite "with the at least one ID and the at least one figure based on the signal characteristic of the at least two service antenna stations at the chosen location". It should be corrected as - - with at least one ID and at least one figure based on a signal characteristic of the at least two service antenna stations at the chosen location - -.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-3, 5-10, 12-17, 22-33, 45 and 47-55 are rejected under 35 U.S.C. 102(b) as being anticipated by Huomo (Pub. No.: 20040203863).

For claim 1, Huomo discloses a signal-comparison based location-determining method, operable by a first portable RF communications device in conjunction with at least two fixed location service-area antenna stations (items 104, 106 and 108 in fig. 1) capable of RF communication with the first portable RF communications device (item 102 in fig1) wherein the stations are substantially continuously operating, the method comprising the steps of:

(a) the first portable RF (item 102 in fig1) communications device monitoring its location by (i) receiving communications signals from a first plurality of local fixed-location service area antenna stations (items 104, 106 and 108 in fig. 1), (ii) identifying at least one ID (cell ID) within at least one of the received communications signals, and (iii) measuring a signal characteristic associated with the received communications signal (other identifiers/time difference/signal strength) from at least two of said first plurality of antenna stations (items 104, 106 and 108 in fig. 1) ([0010]-[0067]). The user terminals are informed 200 of POI-based identifiers, e.g., cell-ID, BSIC, or other identifier corresponding to the wireless area served by that POI. Further, a number of different manners in which the mobile terminal user may be made privy to the location identifiers. For example, the mobile terminal may receive 300 identifiers from a cellular network, such as a cell-ID, BSIC, etc. in a GSM network. Identifiers from base stations are received 400 at the mobile terminal when the mobile terminal is within a certain range of the base

stations. Where a user has previously stored or "marked" one or more identifiers as POIs, the identifier(s) currently received at the mobile is compared 402 with the stored identifiers in the POI list. Additionally, the mobile terminal may therefore receive or "hear" multiple cell-IDs or other access point identifiers at a given time. This may be referred to herein as a "radio fingerprint" which includes several cell-IDs, which will be perceived by the mobile terminal at potentially different relative field strengths. In such a case, the mobile terminal may store a predetermined number, or all, of the cell-IDs or other identifiers associated with the strongest field strengths).

(b) the first portable RF communication device (item 102 in fig1) determining if a monitored location is within proximity to a location chosen by a user of the first portable RF communication device (item 102 in fig1), as a result of, electronically comparing the at least one ID and at least one figure based on the signal characteristic of at least two service antenna stations (items 104, 106 and 108 in fig. 1) at the monitored location with the at least one ID and the at least one figure based on the signal characteristic of the at least two service antenna stations at the chosen location ([0035]-[0047]. Identifiers from base stations are received 400 at the mobile terminal when the mobile terminal is within a certain range of the base stations. Where a user has previously stored or "marked" one or more identifiers as POIs, the identifier(s) currently received at the mobile is compared 402 with the stored identifiers in the POI list. If the received identifier matches a stored identifier as determined at decision block 404, the predefined action associated with the matched identifier is performed. Furthermore, a number of different manners in which the mobile terminal user may be made privy to the location identifiers. For example, the mobile terminal may receive 300 identifiers from a cellular network, such as a cell-ID, BSIC, etc. in a GSM network. Additionally, the mobile terminal may therefore receive or "hear" multiple cell-IDs or other access point identifiers at a given time. This may be referred to herein as a "radio fingerprint" which includes several cell-IDs, which will be perceived by the mobile terminal at potentially different relative field strengths. In such a case, the mobile terminal may store a predetermined number, or all, of the cell-IDs or other identifiers associated with the strongest field strengths).

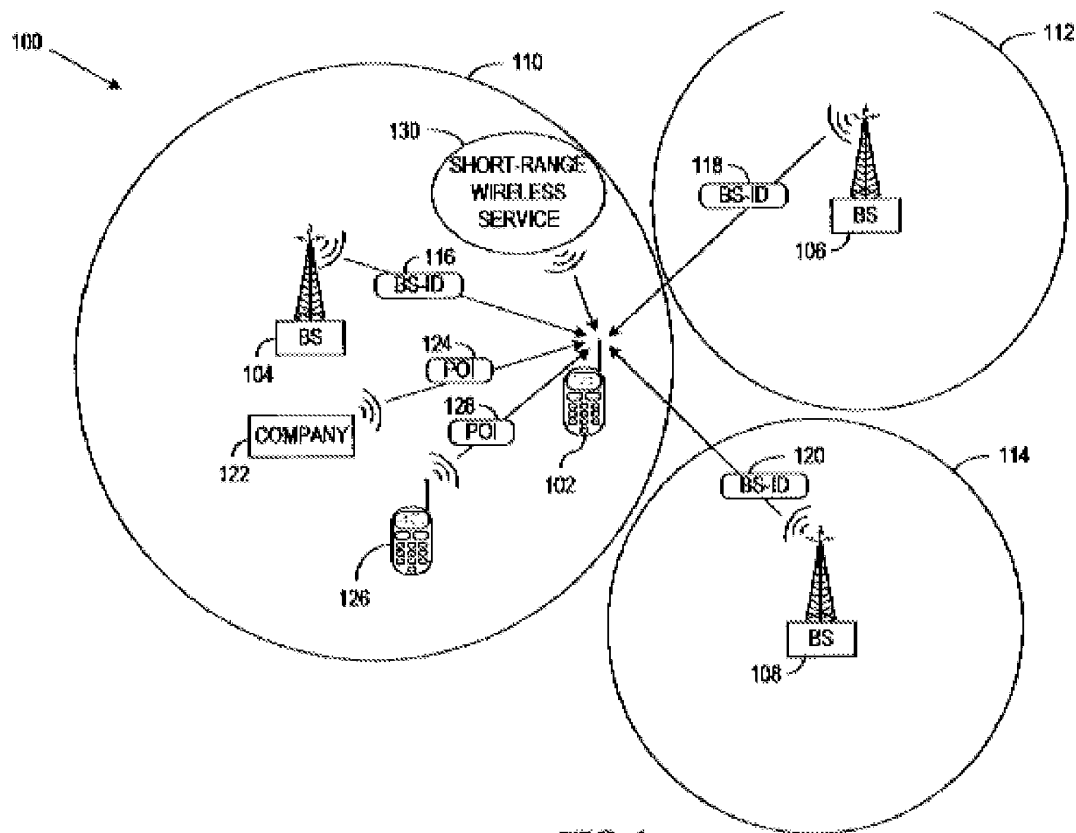


FIG. 1

For claim 2, Huomo discloses the method of claim 1 wherein the signal characteristic is the signal's strength ([0010]-[0067]. The mobile terminal performs signal strength measurements (and bit error rate measurements) on the received signal on the channel it is currently operating on, as well as signal strength measurements on a list of candidate channels supplied to it by the BS).

For claim 3, Huomo discloses the method of claim 2, wherein the signal strengths were measured by the first portable RF communication device ([0010]-[0067]. The mobile terminal performs signal strength measurements (and bit error rate measurements) on the received signal on the channel it is currently operating on, as well as signal strength measurements on a list of candidate channels supplied to it by the BS).

For claim 5, Huomo discloses the of claim 2 wherein the chosen location signal strengths and at least one ID originated from a database of geographic locations and corresponding signal strengths and Ids ([0010]-[0067]. The mobile terminal may receive 300 identifiers from a cellular network, such as a cell-ID, BSIC, etc. in a GSM network).

For claim 6, Huomo discloses the method of claim 5 wherein the database is stored remotely, and not on the first portable RF communication device ([0010]-[0067]. The mobile terminal may receive 300 identifiers from a cellular network, such as a cell-ID, BSIC, etc. in a GSM network).

For claim 7, Huomo discloses the method of claim 5 wherein the database is built by a service provider ([0010]-[0067]. The mobile terminal may receive 300 identifiers from a cellular network, such as a cell-ID, BSIC, etc. in a GSM network).

For claim 8, Huomo discloses the method of claim 5 wherein the database is built based on multiple locations, where for each location, GPS measurements and signal strength measurements are performed and the IDs of nearby base stations are recognized ([0010]-[0067]. The mobile terminal may receive 300 identifiers from a cellular network, such as a cell-ID, BSIC, etc. in a GSM network).

For claim 9, Huomo discloses the method of claim 8 wherein at least for some of the locations, signal strength measurements are taken at different times ([0004]).

For claim 10, Huomo discloses the method of claim 8 wherein the signal strength measurements are taken using a portable RF communication device ([0010]-[0067]. The mobile terminal performs signal strength measurements (and bit error rate measurements) on the received signal on the channel it is currently operating on, as well as signal strength measurements on a list of candidate channels supplied to it by the BS).

For claim 12, Huomo discloses the method of claim 5 wherein the chosen location strengths and at least one IDfingerprint is taken from the database of geographic locations and corresponding signal strengths and IDsfingerprints using a geographic location entered by the first portable RF communication device user as his chosen location ([0010]-[0067]). Mobile terminal 102 will receive a unique base station identifier 116, such as the cell-ID and/or BSIC, from BS 104, as well as such identifiers 118, 120 from other base stations 106, 108 respectively. This information can be used by a mobile terminal-specific implementation to identify or "tag" the area served by one or more of the list of base stations as Points of Interest (POI).

For claim 13, Huomo discloses the method of claim 5 wherein the chosen location signal strengths and at least one ID, which corresponds with a geographical location chosen by the first portable RF communication device user, is the result of extrapolating the signal strengths of locations in the database of geographic locations and corresponding signal strengths and Ids ([0010]-[0067]). Mobile terminal 102 will receive a unique base station identifier 116, such as the cell-ID and/or BSIC, from BS 104, as well as such identifiers 118, 120 from other base stations 106, 108 respectively. This information can be used by a mobile terminal-specific implementation to identify or "tag" the area served by one or more of the list of base stations as Points of Interest (POI).

For claim 14, Huomo discloses the method of claim 5 wherein the chosen location strengths and at least one ID, which corresponds with a geographical location chosen by the first portable RF communication device user, is taken from the database of geographic locations and corresponding signal strengths and IDs, said database being built using computational closure ([0010]-[0067]). Mobile terminal 102 will receive a unique base station identifier 116, such as the cell-ID and/or BSIC, from BS 104, as well as such identifiers 118, 120 from other base stations 106, 108 respectively. This information can be used by a mobile

terminal-specific implementation to identify or "tag" the area served by one or more of the list of base stations as Points of Interest (POI).

For claim 15, Huomo discloses the method of claim 1 wherein the at least one ID is a cell ID ([0010]-[0067]). Mobile terminal 102 will receive a unique base station identifier 116, such as the cell-ID and/or BSIC, from BS 104, as well as such identifiers 118, 120 from other base stations 106, 108 respectively. This information can be used by a mobile terminal-specific implementation to identify or "tag" the area served by one or more of the list of base stations as Points of Interest (POI).

For claim 16, Huomo discloses the method of claim 1 wherein the first portable RF communication device is a mobile phone ([0061]).

For claim 17, Huomo discloses the method of claim 1 wherein the first portable RF communication device is a ubiquitous computer ([0061]).

For claim 22, Huomo discloses the method of claim 1 wherein the signal characteristic is the signal's arrival time ([0004]).

For claim 23, Huomo discloses the method of claim 1 wherein the signal characteristic is the signal's phase ([0004]).

For claim 45, the claim is system claim pertaining to method claim 1 and therefore, is rejected with the same rationale as analyzed in claim 1.

For claim 47, Huomo discloses the method of claim 2 wherein the 'at least one figure based on the signal characteristic' is the signal characteristic, for both the monitored location and the chosen location ([0010]-[0067]).

For claim 48, Huomo discloses the method of claim 2 wherein the 'at least one figure based on the signal characteristic of at least two service antenna stations' is a figure based on a calculation using the signal characteristic of at least two service antenna stations ([0010]-[0067]).

For claim 49, Huomo discloses the method of claim 1 wherein determining if the monitored location is within proximity to a location chosen by a user of the first portable RF communication device further includes informing a location based software program application running on the portable device that the device is at the chosen location or is no longer at the chosen location ([0010]-[0067]).

For claim 50, Huomo discloses the method of claim 1 wherein determining if the monitored location is within proximity to a location chosen by a user of the first portable RF communication device further includes launching a location based software program application on the portable device when the device is at the chosen location ([0010]-[0067]).

For claim 51, Huomo discloses the method of claim 1 wherein the determining starts taking place or stops taking place at specific time intervals or at specific times or depending on the rate the user's location changes or at the occurrence of an event or upon a request from the network or upon a request from a software application on the device or upon a request from the user ([0010]-[0067]).

For claim 52, Huomo discloses the method of claim 51 wherein an event is the device switching the base station it is registered with ([0010]-[0067]. The mobile terminal performs handoff).

For claim 53, Huomo discloses the method of claim 52 wherein the base station is a cell base station ([0010]-[0067]).

For claim 54, Huomo discloses the method of claim 52 wherein the base station is a WiFi base station ([0010]-[0067]). The system includes WLAN base stations).

For claim 55, Huomo discloses the method of claim 1 wherein the at least one ID is a WiFi network ID ([0010]-[0067]). The system includes WLAN base stations

8. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huomo (Pub. No.: 20040203863) in view of Bar-On et al. (Pub. No. 20050159174).

For claim 4, Huomo do not disclose wherein the chosen location signal strengths measured were measured by a second portable RF communication device, different from the first portable RF communication device.

In the same field of endeavor, Bar-On et al. disclose wherein the chosen location signal strengths measured were measured by a second portable RF communication device, different from the first portable RF communication device (fig. 1 and abstract, [0008] and [0013]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Huomo by specifically the chosen location signal strengths measured were measured by a second portable RF communication device, different from the first portable RF communication device, as taught by Bar-On et al., the motivation being in order calculate the location of the target MS (N) from information obtained from the received signals.

9. Claim 11 and 24-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huomo (Pub. No.: 20040203863) in view of De Verteuil (Pub. No.: 20030148771).

For claim 11, Huomo do not disclose wherein the signal strength measurements or calculation results made using the signal strength measurements, along with the base station IDs, are sent by the portable RF communication device to a server responsible for building the database of geographic locations and corresponding signal strengths and base stations Ids.

In the same field of endeavor, De Verteuil disclose wherein the signal strength measurements or calculation results made using the signal strength measurements, along with the base station IDs, are sent by the portable RF communication device to a server responsible for building the database of geographic locations and corresponding signal strengths and base stations Ids ([0043]-[0045]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Huomo by specifically wherein the signal strength measurements or calculation results made using the signal strength measurements, along with the base station IDs, are sent by the portable RF communication device to a server responsible for building the database of geographic locations and corresponding signal strengths and base stations Ids, as taught by De Verteuil, the motivation being in order to provide location outputs for use by any of various service applications.

For claim 24, Huomo do not disclose wherein the monitoring step comprises “low accuracy monitoring” and “high accuracy monitoring.”

In the same field of endeavor, De Verteuil discloses wherein the monitoring step comprises 'low accuracy monitoring' and 'high accuracy monitoring' ([0012]-[0045]). A low resource/fast response time source, such as a network source that provides Cell ID information, may first be accessed to obtain low accuracy location information. Although such information may have a lower accuracy, such accuracy may still be sufficient to determine, for example, that a subscriber is well outside his home zone. The need to access a higher resource and/or slower response time source can thus be avoided until the Cell ID information indicates that higher accuracy information is required, e.g., because the coverage area of the identified cell overlaps the home zone).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Huomo by specifically the monitoring step comprises 'low accuracy monitoring' and 'high accuracy monitoring', as taught by De Verteuil, the motivation being in order to determine whether more accurate information is necessary, e.g., in connection with a call placed to or from a subscriber.

For claim 25, De Verteuil discloses the method of claim 24 wherein 'low accuracy monitoring' includes comparing the cell-IDs of the chosen location with the cell-IDs of the current location ([0012]-[0045]). Cell ID information is used to determine whether more accurate information is necessary, e.g., in connection with a call placed to or from a subscriber.

For claim 26, De Verteuil discloses the method of claim 25 wherein 'high accuracy monitoring' takes place only if cell IDs of the current location are determined to match cell IDs of the chosen location in the 'low accuracy monitoring' step ([0012]-[0045]). A low resource/fast

response time source, such as a network source that provides Cell ID information, may first be accessed to obtain low accuracy location information. Although such information may have a lower accuracy, such accuracy may still be sufficient to determine, for example, that a subscriber is well outside his home zone. The need to access a higher resource and/or slower response time source can thus be avoided until the Cell ID information indicates that higher accuracy information is required, e.g., because the coverage area of the identified cell overlaps the home zone).

For claim 27, De Verteuil discloses the method of claim 26 wherein 'high accuracy monitoring' includes measuring a signal characteristic at the current location ([0012]-[0045]. A low resource/fast response time source, such as a network source that provides Cell ID information, may first be accessed to obtain low accuracy location information. Although such information may have a lower accuracy, such accuracy may still be sufficient to determine, for example, that a subscriber is well outside his home zone. The need to access a higher resource and/or slower response time source can thus be avoided until the Cell ID information indicates that higher accuracy information is required, e.g., because the coverage area of the identified cell overlaps the home zone).

For claim 28 Uomo do not disclose the monitoring step is performed iteratively, with a predetermined time delay between successive iterations such that data from the monitoring step is used only if a substantial portion of the successive measurements are alike within a predetermined threshold.

In the same field of endeavor, De Verteuil disclose the monitoring step is performed iteratively, with a predetermined time delay between successive iterations such that data from the monitoring step is used only if a substantial portion of the successive measurements are alike within a predetermined threshold ([0012]-[0045]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Uomo by specifically wherein the monitoring

step is performed iteratively, with a predetermined time delay between successive iterations such that data from the monitoring step is used only if a substantial portion of the successive measurements are alike within a predetermined threshold, as taught by De Verteuil, the motivation being in order to provide location outputs for use by any of various service applications.

Allowable Subject Matter

Claim 29 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dai A Phuong whose telephone number is 571-272-7896. The examiner can normally be reached on Monday to Friday, 9:00 A.M. to 5:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on 571-272-7603. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2617

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/DAI A PHUONG/

Primary Examiner, Art Unit 2617

Date: 09/15/2011

Notice of References Cited	Application/Control No. 12/720,362	Applicant(s)/Patent Under Reexamination SHKEDI, ROY	
	Examiner DAI A. PHUONG	Art Unit 2617	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2004/0203863	10-2004	Huomo, Heikki	455/456.1
*	B	US-2003/0148771	08-2003	de Verteuil, Andre Laurent	455/456
*	C	US-2005/0159174	07-2005	Bar-On et al.	455/456.6
	D	US-			
	E	US-			
	F	US-			
	G	US-			
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	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
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	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Substitute for form 1449A/PTO

(use as many sheets as necessary)

Sheet	1	of	1
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Complete if Known

Application Number	12/270,362
Filing Date	03/09/2010
First Named Inventor	Shkedi, Roy
Art Unit	
Examiner Name	
Attorney Docket Number	

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No. 1	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number - Kind Code* (if known)			
		us- 7,640,288	12/29/09	Yao	
		us- 7,433,694	10/7/08	Morgan	
		us- 7,414,988	8/19/08	Jones	
		us- 7,305,245	12/4/07	Alizadeh-Shabdiz	
		us- 7,403,762	7/22/08	Morgan	
		us- 7,502,620	3/10/09	Morgan	
		us- 7,493,127	2/17/09	Morgan	
		us- 7,474,897	1/6/09	Morgan	
		us- 7,471,954	12/30/08	Brachet	
		us- 7,515,578	4/7/09	Alizadeh-Shabdiz	
		us- 7,551,579	6/23/09	Alizadeh-Shabdiz	
		us- 7,551,929	6/23/09	Alizadeh-Shabdiz	
		us- 7,768,963	8/3/10	Alizadeh-Shabdiz	
		us- 7,769,396	8/3/10	Alizadeh-Shabdiz	
		us- 7818017	10/10/10	Alizadeh-Shabdiz	
		us- 7835754	11/16/10	Alizadeh-Shabdiz	
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FOREIGN PATENT DOCUMENTS

[illegible]

**Examiner
Signature**

/Dai Phuong/

Date Considered	
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09/15/2011

1 Applicant's unique citation designation number (optional). 2 See Kinds Documents of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO:** Assistant Commissioner for Patents, Washington, DC 20231.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.P./

<i>Index of Claims</i> 	Application/Control No. 12720362	Applicant(s)/Patent Under Reexamination SHKEDI, ROY
	Examiner DAI A PHUONG	Art Unit 2617

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
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☐ Claims renumbered in the same order as presented by applicant										☐ CPA										☐ T.D.										☐ R.1.47									
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<i>Index of Claims</i> 	Application/Control No. 12720362	Applicant(s)/Patent Under Reexamination SHKEDI, ROY
	Examiner DAI A PHUONG	Art Unit 2617

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant										☐ CPA										☐ T.D.										☐ R.1.47									
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Search Notes 	Application/Control No. 12720362	Applicant(s)/Patent Under Reexamination SHKEDI, ROY
	Examiner DAI A PHUONG	Art Unit 2617

SEARCHED			
Class	Subclass	Date	Examiner
455	432.1-442, 456.1-456.3	3/24/11	ad
	East search updated	09/15/11	ad

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor Search	3/24/11	ad
Inventor search updated	09/15/2011	ad

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

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Application Number 	Application/Control No. 12/720,362	Applicant(s)/Patent under Reexamination SHKEDI, ROY	
Document Code - DISQ		Internal Document – DO NOT MAIL	

TERMINAL DISCLAIMER	☒ APPROVED	☐ DISAPPROVED
Date Filed : 06/28/2011	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:

Dorethea Lawrence

U.S. Patent and Trademark Office



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/720,362	03/09/2010	Roy Shkedi	B030910	8899
24271 7590 06/29/2011 JOHN ALEXANDER GALBREATH 2516 CHESTNUT WOODS CT REISTERSTOWN, MD 21136			EXAMINER PHUONG, DAI	
			ART UNIT 2617	PAPER NUMBER
			MAIL DATE 06/29/2011	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Interview Summary	Application No.	Applicant(s)	
	12/720,362	SHKEDI, ROY	
	Examiner	Art Unit	
	DAI A. PHUONG	2617	

All participants (applicant, applicant's representative, PTO personnel):

(1) DAI A. PHUONG. (3) ____.

(2) John Galbreath. (4) ____.

Date of Interview: 23 June 2011.

Type: a) ☐ Telephonic b) ☐ Video Conference
c) ☒ Personal [copy given to: 1) ☐ applicant 2) ☐ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☒ No.
If Yes, brief description: ____.

Claim(s) discussed: 1 and 45.

Identification of prior art discussed: Farne et al. and Phatak et al..

Agreement with respect to the claims f) ☐ was reached. g) ☐ was not reached. h) ☒ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: The proposed amendment overcomes claim objection and 112 paragraph and Farmer et al.. Additionally, the Applicant presented argument concerning the determining step in claims 1 and 45. However, the Examiner will further consider the argument after receiving the official response..

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER OF ONE MONTH OR THIRTY DAYS FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

/DAI A PHUONG/ Primary Examiner, Art Unit 2617	
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Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews

Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

In the United States Patent and Trademark Office

Serial Number: 12/720,362

Appl. Filed: 03/09/2010

First-Named Inventor: Shkedi, Roy

Appl. Title: Signal Comparison-Based Location Determining Method

Examiner/GAU: PHUONG, Dai A. / 2617

Amendment A

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Dear Sir or Madam:

In reply to the Office Action dated 03/28/2011 and consistent with the agreements reached in the 06/23/2011 Examiner Interview, Applicant requests that the application be amended as follows:

CLAIM AMENDMENTS

1. (Currently amended) A signal-comparison based location-determining method,
operable by a first portable RF communications device in conjunction with at least
two fixed location service-area antenna stations capable of RF communication with
the first portable RF communications device wherein the stations are substantially
continuously operating, the method comprising the steps of:
 - (a) the first portable RF communications device monitoring its location by (i) receiving
communications signals from a first plurality of local fixed-location service-area antenna
stations, (ii) identifying at least one ID within at least one of the received
communications signals, and (iii) measuring a signal characteristic associated with the
received communications signals from at least two of said first plurality of antenna
stations;
 - (b) the first portable RF communication device determining if a the monitored location is
within proximity to a location chosen by a user of the first portable RF communication
device, as a result of ~~by~~ electronically comparing the at least one ID and at least one
figure based on the signal characteristic of at least two service antenna stations at the
monitored location with the at least one ID and the at least one figure based on the signal
characteristic of the at least two service antenna stations at the chosen location.
~~a fingerprint of the monitored location with a fingerprint of the chosen location, wherein~~

~~the fingerprint of a given location is a group of figures identifying the location which include at least one figure which is an ID within a communication signal received at the given location and at least one figure which is based on a characteristic of a signal received at the location.~~

2. (Currently amended) The method of claim 1 wherein the signal characteristic ~~of a signal at the location~~ is the signal's strength, ~~and the location fingerprint is based on at least one signal strength at the location.~~
3. (Currently amended) The method of claim 2 wherein the chosen location ~~fingerprint~~ is ~~based on~~ signal strengths were measured by the first portable RF communication device.
4. (Currently amended) The method of claim 2 wherein the chosen location ~~fingerprint~~ is ~~based on~~ signal strengths were measured by a second portable RF communication device, different from the first portable RF communication device.
5. (Currently amended) The method of claim 2 wherein the chosen location ~~fingerprint~~ is ~~based on~~ signal strengths and at least one ID originated~~ing~~ from a database of geographic locations and corresponding signal strengths and IDs~~fingerprints~~.

6. (Original) The method of claim 5 wherein the database is stored remotely, and not on the first portable RF communication device.
7. (Original) The method of claim 5 wherein the database is built by a service provider.
8. (Currently amended) The method of claim 5 wherein the database is built based on multiple locations, where for each location, GPS measurements and signal strength measurements are performed and the IDs of nearby base station~~cells~~ are recognized.
9. (Original) The method of claim 8 wherein at least for some of the locations, signal strength measurements are taken at different times.
10. (Original) The method of claim 8 wherein the signal strength measurements are taken using a portable RF communication device.
11. (Currently amended) The method of claim 10 wherein the signal strength measurements or calculation results made using the signal strength measurements, along with the base station~~cell~~ IDs, are sent by the portable RF communication device to a server responsible for building the database of geographic locations and corresponding signal strengths and base stations IDs~~fingerprints~~.

12. (Currently amended) The method of claim 5 wherein the chosen location signal strengths and at least one IDfingerprint is taken from the database of geographic locations and corresponding signal strengths and IDsfingerprints using a geographic location entered by the first portable RF communication device user as his chosen location.
13. (Currently amended) The method of claim 5 wherein the chosen location signal strengths and at least one IDfingerprint, which corresponds with a geographical location chosen by the first portable RF communication device user, is the result of extrapolating the signal strengths fingerprints of locations in the database of geographic locations and corresponding signal strengths and IDsfingerprints.
14. (Currently amended) The method of claim 5 wherein the chosen location signal strengths and at least one IDfingerprint, which corresponds with a geographical location chosen by the first portable RF communication device user, is taken from the database of geographic locations and corresponding signal strengths and IDsfingerprints, said database being built using computational closure.
15. (Original) The method of claim 1 wherein the at least one ID is a cell ID.
16. (Original) The method of claim 1 wherein the first portable RF communication device is a mobile phone.

17. (Original) The method of claim 1 wherein the first portable RF communication device is a ubiquitous computer.

18. to 21. (Canceled)

22. (Currently amended) The method of claim 1 wherein the signal characteristic of a signal at the location is the signal's arrival time, and the location's fingerprint comprises at least one arrival time at the location of a signal broadcasted by nearby cell towers and the ID of at least one of the cell towers.

23. (Currently amended) The method of claim 1 wherein the signal characteristic of a signal at the location is the signal's phase, and the location's fingerprint comprises at least one phase at the location of signals broadcasted by nearby cell towers and the ID of at least one of the cell towers.

24. (Original) The method of claim 1 wherein the monitoring step comprises 'low accuracy monitoring' and 'high accuracy monitoring'.

25. (Currently amended) The method of claim 24 wherein 'low accuracy monitoring' includes comparing the cell-IDs of the chosen location with the cell-IDs of the current location.

26. (Currently amended) The method of claim 25 wherein ‘high accuracy monitoring’ takes place only if ~~cell~~ IDs of the current location are determined to match ~~cell~~-IDs of the chosen location in the ‘low accuracy monitoring’ step.

27. (Original) The method of claim 26 wherein ‘high accuracy monitoring’ includes measuring a signal characteristic at the current location.

28. (Original) The method of claim 1 wherein the monitoring step is performed iteratively, with a predetermined time delay between successive iterations such that data from the monitoring step is used only if a substantial portion of the successive measurements are alike within a predetermined threshold.

29. (Original) The method of claim 2 wherein the monitored location of the first portable RF communication device is determined to be within proximity of the chosen location if the difference between measured signal strengths at the monitored location and signal strengths at the chosen location is less than a predetermined threshold.

30. to 44. (Canceled)

45. (Currently amended) A signal-comparison based location-determining system, comprising:

(a) a first portable RF communications device communicating with at least two fixed location service-area antenna stations capable of RF communication with the first portable RF communications device, wherein the antenna stations are substantially continuously operating;

(b) software residing on the first portable RF communications device, said software causing the first portable RF communications device to monitor its location by (i) receiving communications signals from a first plurality of local fixed-location service-area antenna stations, (ii) identifying at least one ID within at least one of the received communications signals, and (iii) measuring a signal characteristic associated with the received communications signals from at least two of said first plurality of antenna stations;

(c) software residing on the first portable RF communication device, said software causing the first portable RF communication device to determine if the monitored location is within proximity to a location chosen by a user of the first portable RF communication device, as a result of by electronically comparing the at least one ID and at least one figure based on the signal characteristic of at least two service antenna stations at the monitored location with the at least one ID and the at least one figure based on the signal characteristic of the at least two service antenna stations at the chosen location.

~~a fingerprint of the monitored location with a fingerprint of the chosen location, wherein the fingerprint of a given location is a group of figures identifying the location which include at least one figure which is an ID within a communication signal received at the given location and at least one figure which is based on a characteristic of a signal received at the location.~~

46. (Canceled)

47. (New) The method of claim 2 wherein the ‘at least one figure based on the signal characteristic’ is the signal characteristic, for both the monitored location and the chosen location.

48. (New) The method of claim 2 wherein the ‘at least one figure based on the signal characteristic of at least two service antenna stations’ is a figure based on a calculation using the signal characteristic of at least two service antenna stations.

49. (New) The method of claim 1 wherein determining if the monitored location is within proximity to a location chosen by a user of the first portable RF communication device further includes informing a location based software program application running on the portable device that the device is at the chosen location or is no longer at the chosen location.

50. (New) The method of claim 1 wherein determining if the monitored location is within proximity to a location chosen by a user of the first portable RF communication device further includes launching a location based software program application on the portable device when the device is at the chosen location.

51. (New) The method of claim 1 wherein the determining starts taking place or stops taking place at specific time intervals or at specific times or depending on the rate the user's location changes or at the occurrence of an event or upon a request from the network or upon a request from a software application on the device or upon a request from the user.

52. (New) The method of claim 51 wherein an event is the device switching the base station it is registered with.

53. (New) The method of claim 52 wherein the base station is a cell base station.

54. (New) The method of claim 52 wherein the base station is a WiFi base station.

55. (New) The method of claim 1 wherein the at least one ID is a WiFi network ID.

REMARKS

I. Overview of Claim Amendments

Claims 18-21, 30-44, and 46 have been canceled. Claims 1 and 45, the remaining independent claims in the application, have been amended to address the various issues raised in the Office Action as discussed further below. The dependent claims have been amended, as appropriate, for consistency and proper antecedency with the amended independent claims. New claims 47-55 have been added.

II. Double-Patenting Rejections

A terminal disclaimer is included with this amendment, obviating the obviousness-type double patenting rejections.

III. Claim Objections

Claims 1 and 45 have been amended to make the corrections required in the Office Action. Specifically, Claim 1 has been amended to recite “the first portable communications device” in line 3, and recite “a monitored location” in line 10. Claim 45 has been amended to recite “the first portable communications device” in lines 3-18.

IV. Claims 1-46 – 35 USC 112 Rejections

Regarding Claims 30 and 46, these have been canceled. Regarding Claims 1 and 45, the objected-to language has been deleted as part of the overall amendments made to these claims. As agreed in the Examiner Interview, the amended claim language is definite and overcomes the 112 rejections.

V. Claims 1-3 and 5-46 – 35 USC 103 Rejection – Phatak ‘114 in View of Farmer ‘706; Claim 4 – 35 USC 103 Rejection – Phatak ‘114 in View of Farmer ‘706 & Bar-On ‘174

The Office Action concedes (see page 7) that Phatak does not disclose part (b) of the original Claim 1 – that is, “the first portable RF communication device determining if the monitored location is within proximity to a location chosen by a user of the first portable RF communication device, by electronically comparing a fingerprint of the monitored location with a fingerprint of the chosen location, wherein the fingerprint of a given location is a group of figures identifying the location which include at least one figure which is an ID within a communication signal received at the given location and at least one figure which is based on a characteristic of a signal received at the location.”

However, the Office Action states (see page 8) that Farmer does disclose part (b) of original Claim 1. Thus, Applicant has amended part (b) of Claim 1 to further define that the inventive method measures the signal characteristic of at least two service antenna

stations, at both the monitored location and the chosen location. As agreed in the Examiner Interview, this amendment overcomes Farmer since Farmer does not disclose or suggest measuring the signal at more than one service antenna station.

Moreover, Phatak also does not disclose or suggest the amended part (b) language in Claim 1. Applicant has added the use of at least two service antenna stations to overcome Farmer, but other than that, the language added to part (b) is basically the same as the language deleted from part (b). Said another way, other than the “at least two service antenna stations” limitation which overcomes Farmer, the new language in part (b) simply rewords and rearranges the old language to make the claim clearer and easier to understand. The same essential elements – which Phatak does not meet – are present in part (b) of the amended claim.

More generally, Applicant points out that neither Phatak, nor Farmer, nor Bar-On for that matter, discloses the key “determining” step in part (b) of Claim 1. Specifically, none of the prior art discloses determining if the monitored location is within proximity to the chosen location – or in other words, determining if the user has reached the desired location or has left the desired location. Instead, both Phatak and Farmer involve merely determining the user’s geographic location, which is a very different thing.

The same amendments have been made to part (c) of Claim 45, which is the system claim corresponding to the method claim of Claim 1. Claim 45 thus overcomes the prior art for the same reasons as Claim 1, discussed above.

Applicant submits that the claim amendments are fully supported by the original specification and claims. Specifically, paragraph 0069 of the USPTO-published specification clearly states (emphasis supplied):

“Now, additional embodiments and aspects of the instant invention may be embodied in various forms, wherein a second appurtenance embodiment (see FIG. 5) of the instant invention relates to an article of manufacture including a computer usable medium having computer readable program code embodied therein for Signal-Comparison Based Location-Determining, the computer readable program code in said article of manufacture including: (AA) first computer readable program code -500- for causing a computer to Register a selected location by first-causing a portable RF communications device at the selected location (i) to receive an RF communications signal from a plurality of local fixed-location service-area antenna stations, and (ii) to measure reception signal strength respectively associated with the received signal from at least two of the plurality of antenna stations; (BB) tied to the first computer readable software, second computer readable program code -510- for causing the computer to Record the selected location by electronically storing at least two of the respective reception signal strength measurements; (CC) tied to the second computer readable software, third computer readable program code -520- for causing the computer to Monitor by second-

causing a portable RF communications device (i) to receive communications signals from a plurality of respectively local fixed-location service-area antenna stations, and (ii) to measure reception signal strength associated with the signals; and (DD) tied to the third computer readable software, fourth computer readable program code -530- for causing the computer Determine if the portable RF communications device of the Monitoring step is at the selected location of the registering step by electronically comparing measurements in the monitoring step with the stored at least two measurements of the Recording step.”

Further, the parent application (Appl. No. 11/533,238), to which priority is claimed and which is incorporated in this continuation application by reference, contained original claims which recite the use of at least two service antenna stations. See Claims 1, 11, and others.

Dependent Claims

Claims 2-17, 22-29, and 48-55 depend directly or indirectly from Claim 1, and thus are patentable over the prior art for the same reasons as Claim 1.

In addition, regarding Claims 24-27: the Office Action interprets Farmer’s GPS reading of an exact coordinate to be the ‘high accuracy monitoring’ defined in these claims, and also interprets Phatak’s establishing a geo region within the cell phone is located as the ‘low accuracy monitoring’ defined in these claims. However, these interpretations are

not correct. The present invention saves cell phone resources by checking first for a base station ID match only, before allocating more resources to compare signal strengths and see if the entire fingerprints match. This process is clearly defined in Claim 26, and it is simply not present in either Phatak or Farmer. Indeed, Phatak and Farmer have no reason to do these steps, as they only check what the existing geographic location is, and not whether a cell phone has reached or left a desired destination as in the invention.

APPLICANT INTERVIEW SUMMARY

Pursuant to MPEP § 2281, Applicant hereby concurs with the substance of the Examiner's Interview Summary dated 06/23/2011.

CONCLUSION

For all of the above reasons, Applicant respectfully requests that the rejections be reconsidered. Applicant submits that the claims all define patentably over the prior art, and are definite and statutory. The application is in condition for allowance, which action they respectfully solicit.

Respectfully,

/John A. Galbreath/
John A. Galbreath, Reg. #46,718
Galbreath Law Offices, P.C.
2516 Chestnut Woods Court
Reisterstown, MD 21136
Tel. (410) 628-7770

Certificate of Electronic Transmission: I certify that on the date below, this document and referenced attachments, if any, was submitted to the U.S. Patent Office via its EFS-Web system.

28 June 2011

/John A. Galbreath/
John A. Galbreath

**TERMINAL DISCLAIMER TO OBTAIN A PROVISIONAL DOUBLE PATENTING
REJECTION OVER A PENDING "REFERENCE" APPLICATION**

Docket Number (Optional)

In re Application of:

Application No.: 12/720,362

Filed: 03/09/2010

For: SIGNAL COMPARISON-BASED LOCATION DETERMINING METHOD

The owner*, BROADPHONE LLC, of 100% percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending **reference** Application Number 11/533,238, filed on 09/19/2006, as such term is defined in 35 U.S.C. 154 and 173, and as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the **reference** application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

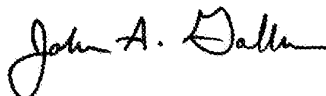
In making the above disclaimer, the owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term as defined in 35 U.S.C. 154 and 173 of any patent granted on said **reference** application, "as the term of any patent granted on said **reference** application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending **reference** application," in the event that: any such patent: granted on the pending **reference** application: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

Check either box 1 or 2 below, if appropriate.

1. ☐ For submissions on behalf of a business/organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the business/organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. ☒ The undersigned is an attorney or agent of record. Reg. No. 46,718



06/27/2011

Signature

Date

John A. Galbreath

Typed or printed name

410-628-7770

Telephone Number

- ☒ Terminal disclaimer fee under 37 CFR 1.20(d) is included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this statement. See MPEP § 324.

This collection of information is required by 37 CFR 1.321. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Patent Application Fee Transmittal				
Application Number:		12720362		
Filing Date:		09-Mar-2010		
Title of Invention:		Signal Comparison-Based Location Determining Method		
First Named Inventor/Applicant Name:		Roy Shkedi		
Filer:		John Alexander Galbreath		
Attorney Docket Number:		B030910		
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Statutory or terminal disclaimer	2814	1	70	70
Total in USD (\$)				70

Electronic Acknowledgement Receipt	
EFS ID:	10407339
Application Number:	12720362
International Application Number:	
Confirmation Number:	8899
Title of Invention:	Signal Comparison-Based Location Determining Method
First Named Inventor/Applicant Name:	Roy Shkedi
Customer Number:	24271
Filer:	John Alexander Galbreath
Filer Authorized By:	
Attorney Docket Number:	B030910
Receipt Date:	28-JUN-2011
Filing Date:	09-MAR-2010
Time Stamp:	17:05:15
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$70
RAM confirmation Number	4433
Deposit Account	504432
Authorized User	GALBREATH,JOHN A.
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		12720362-Continuation-Amendment-A.pdf	125656	yes	17
			c8bb0de68de2906885ef1990ca76a86caacd2ca7		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Claims		2	10	
	Applicant Arguments/Remarks Made in an Amendment		11	17	
Warnings:					
Information:					
2	Terminal Disclaimer Filed	12720362-Continuation-Terminal-Disclaimer.pdf	133582	no	1
			8e87e5c6a8b74b7dc62e2b4a2030f0a140f9a5d		
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	29952	no	2
			c43c4a718ad940f0a9d6219f1c0b438748c4af44		
Warnings:					
Information:					
Total Files Size (in bytes):			289190		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 12/720,362		Filing Date 03/09/2010		☐ To be Mailed		
APPLICATION AS FILED – PART I										
(Column 1)		(Column 2)		SMALL ENTITY ☒ OR		OTHER THAN SMALL ENTITY				
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A				
☐ SEARCH FEE (37 CFR 1.16(k), (j), or (m))	N/A	N/A	N/A			N/A				
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A				
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$ =		OR	X \$ =				
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =			X \$ =				
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).									
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))										
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL				
APPLICATION AS AMENDED – PART II										
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY OR		OTHER THAN SMALL ENTITY		
AMENDMENT	06/28/2011	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 35	Minus	** 46	= 0	X \$26 =	0	OR	X \$ =	
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 4	= 0	X \$110 =	0	OR	X \$ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE	0	OR	TOTAL ADD'L FEE	
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =		OR	X \$ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =		OR	X \$ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.										

Legal Instrument Examiner:
/ROLITA WIMBUSH/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)				Application Number	12/270,362
				Filing Date	03/09/2010
				First Named Inventor	Shkedi, Roy
				Art Unit	
				Examiner Name	
Sheet	1	of	1	Attorney Docket Number	

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. 1	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number- Kind Code* (if known)			
		us- 7,640,288	12/29/09	Yao	
		us- 7,433,694	10/7/08	Morgan	
		us- 7,414,988	8/19/08	Jones	
		us- 7,305,245	12/4/07	Alizadeh-Shabdiz	
		us- 7,403,762	7/22/08	Morgan	
		us-7,502,620	3/10/09	Morgan	
		us-7,493,127	2/17/09	Morgan	
		us- 7,474,897	1/6/09	Morgan	
		us- 7,471,954	12/30/08	Brachet	
		us- 7,515,578	4/7/09	Alizadeh-Shabdiz	
		us- 7,551,579	6/23/09	Alizadeh-Shabdiz	
		us- 7,551,929	6/23/09	Alizadeh-Shabdiz	
		us- 7,768,963	8/3/10	Alizadeh-Shabdiz	
		us- 7,769,396	8/3/10	Alizadeh-Shabdiz	
		us- 7818017	10/10/10	Alizadeh-Shabdiz	
		us- 7835754	11/16/10	Alizadeh-Shabdiz	
		us-			
		us-			
		us-			
		us-			

[illegible]

Examiner Signature		Date Considered	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). ² See Kind Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO:** Assistant Commissioner for Patents, Washington, DC 20231.

In the United States Patent and Trademark Office

Serial Number: 12/720,362
Appl. Filed: 09 March 2010
First Named Inventor: SHKEDI, Roy
Appl. Title: Signal Comparison-Based Location Determining Method
Examiner/GAU: Phuong, Dai / 2617

Statement Accompanying Information Disclosure Statement

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir or Madam:

In connection with the accompanying Information Disclosure Statement in the above-referenced application, Applicant hereby states that each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement.

Respectfully,

/John A. Galbreath/
John A. Galbreath, Reg. #46,718

Galbreath Law Offices, P.C.
2516 Chestnut Woods Court
Reisterstown, MD 21136
Tel. (410) 628-7770

Electronic Acknowledgement Receipt	
EFS ID:	10230280
Application Number:	12720362
International Application Number:	
Confirmation Number:	8899
Title of Invention:	Signal Comparison-Based Location Determining Method
First Named Inventor/Applicant Name:	Roy Shkedi
Customer Number:	24271
Filer:	John Alexander Galbreath
Filer Authorized By:	
Attorney Docket Number:	B030910
Receipt Date:	03-JUN-2011
Filing Date:	09-MAR-2010
Time Stamp:	16:13:29
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	12720362-Shkedi-IDS.pdf	152043 f2dc52d05b40d9f708e781609685687ce2df9d23	no	1

Warnings:

Information:

This is not an USPTO supplied IDS fillable form					
2	Miscellaneous Incoming Letter	12720362-Shkedi-Statement-Accompanying-IDS.pdf	73803 f8d34373f3c33e9e774145aa53b6be746f30cd9e	no	1
Warnings:					
Information:					
Total Files Size (in bytes):			225846		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					



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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/720,362	03/09/2010	Roy Shkedi	B030910	8899
24271 7590 03/28/2011 JOHN ALEXANDER GALBREATH 2516 CHESTNUT WOODS CT REISTERSTOWN, MD 21136			EXAMINER PHUONG, DAI	
			ART UNIT 2617	PAPER NUMBER
			MAIL DATE 03/28/2011	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 12/720,362	Applicant(s) SHKEDI, ROY	
	Examiner DAI A. PHUONG	Art Unit 2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 09 March 2010.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 1-46 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 1-46 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on 09 March 2010 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
 Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The references listed in the Information Disclosure Statement filed on 03/09/2010 have been considered by the examiner (see attached PTO-1449 form or PTO/SB/08A and 08B).

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-46 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over U.S. 7706811. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following.

Present Application	U.S. 7706811
. A signal-comparison based location-determining method, operable by a first	1. A Signal-Comparison Based Location-Determining Method, operable by at least one

portable RF communications device in conjunction with at least two fixed location service-area antenna stations capable of RF communication with the device wherein the stations are substantially continuously operating, the method comprising the steps of: (a) the first portable RF communications device monitoring its location by (i) receiving communications signals from a plurality of local fixed-location service-area antenna stations, (ii) identifying at least one ID within at least one of the received communications signals, and (iii) measuring a signal characteristic associated with the communications signals; (b) the first portable RF communication device determining if the monitored location is within proximity to a location chosen by a user of the first portable RF communication device, by electronically comparing a fingerprint of the monitored location with a fingerprint of the	portable RF communications device in conjunction with at least two fixed-location service-area antenna stations capable of RF communication with the at least one device wherein the stations are substantially continuously operating, and the method is comprising the steps of: (A) registering a selected location by causing a first portable RF communications device at the selected location (i) to receive an RF communications signal from a first plurality of local fixed-location service-area antenna stations, and (ii) to measure reception signal strength associated with the received signal from at least two of said first plurality of antenna stations; (B) recording the selected location by electronically storing at least two of the reception signal strength measurements; (C) monitoring by causing said first portable RF communications device or a second portable RF communications device (i) to
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chosen location, wherein the fingerprint of a given location is a group of figures identifying the location which include at least one figure which is an ID within a communication signal received at the given location and at least one figure which is based on a characteristic of a signal received at the location.	receive communications signals from said first plurality of local fixed-location service-area antenna stations or a second plurality of local fixed-location service-area antenna stations, and (ii) to measure reception signal strength associated with the signals; (D) determining if said first portable RF communications device or said second portable RF communications device of the monitoring step is at the selected location of the registering step by electronically comparing measurements in the monitoring step with the stored at least two measurements of the recording step, wherein the registering step includes identifying at least one ID within at least one of the received signals; and the recording step includes storing each of the at least one IDs with the reception signal strength measurement, and wherein the monitoring step includes identifying at least one ID within at least one of the received signals and the determining
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	step includes electronically matching at least one ID of the monitoring step with the stored at least one ID of the recording step.
--	---

Regarding claims 2-46 are rejected for the same reasons set forth above.

Claim Objections

3. Claims 1 and 45 are objected to because of the following informalities:

Regarding claim 1, line 3 recites “the device”. It should be corrected as - - the first portable RF communication device - -.

line 10 recites “the monitored location”. It should be corrected as - - a monitored location - -.

Regarding claim 45, lines 3-18 recite “the device”. It should be corrected as - - the first portable RF communication device - -.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-46 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, lines 14-16 recites “the location”. However, the Examiner does not understand that “the location” is referred to "monitored location", "location chosen" or "given location".

Regarding claim 30, lines 5-7 recites “the location”. However, the Examiner does not understand that “the location” is referred to "monitored location", "location chosen" or "given location".

Regarding claim 45, lines 16-18 recites “the location”. However, the Examiner does not understand that “the location” is referred to "monitored location", "location chosen" or "given location".

Regarding claim 46, lines 6-8 recites “the location”. However, the Examiner does not understand that “the location” is referred to "monitored location", "location chosen" or "given location".

Claims 2-27, 31-44 are dependent on claims 1 and 30 respectively. Therefore, the claims are also rejected.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-3 and 5-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Phatak et al. (Pub. No. 20080039114) in view of Farmer et al. (Pub. No. 20100156706).

For claim 1, Phatak et al. disclose a signal-comparison based location-determining method, operable by a first portable RF communications device in conjunction with at least two fixed location service-area antenna stations capable of RF communication with the device wherein the stations are substantially continuously operating, the method comprising the steps of:

(a) the first portable RF communications device monitoring its location by (i) receiving communications signals from a plurality of local fixed-location service-area antenna stations, (ii) identifying at least one ID within at least one of the received communications signals, and (iii) measuring a signal characteristic associated with the communications signals ([0037] to [0045]. A wireless device may measure signal strengths of a serving base station and neighboring base stations identified by base station cell IDs. The location of the wireless device can be estimated by finding intersections of the coverage areas of the base stations whose cell IDs are reported by the cell phone);

However, Phatak et al. do not disclose (b) the first portable RF communication device determining if the monitored location is within proximity to a location chosen by a user of the first portable RF communication device, by electronically comparing a fingerprint of the monitored location with a fingerprint of the chosen location, wherein the fingerprint of a given location is a group of figures identifying the location which include at least one figure which is an ID within a communication signal received at the given location and at least one figure which is based on a characteristic of a signal received at the location.

In the same field of endeavor, Farmer et al. disclose (b) the first portable RF communication device determining if the monitored location is within proximity to a location chosen by a user of the first portable RF communication device, by electronically comparing a fingerprint of the monitored location with a fingerprint of the chosen location, wherein the fingerprint of a given location is a group of figures identifying the location which include at least one figure which is an ID within a communication signal received at the given location and at least one figure which is based on a characteristic of a signal received at the location ([0042] to [0045]). The mobile station receives the BSIC/PSC identifier and carrier frequency of the current base station 44. The MS searches the position database 42 for the BSIC/PSC identifier and carrier frequency 46 to determine if they have yet been initialized within the database 48. Furthermore, the mobile station compares the cell ID located in the database with the cell ID received from the base station 54 to ensure that the BSIC/PSC identifier and carrier frequency are that of a known base station with which the MS communicated at an earlier time, rather than that of a base station elsewhere in the world that was not been previously encountered when determining position. If the cell ID received from the current base station matches that in the position database associated with the current BSIC/PSC identifier and carrier frequency, then the position database is validated for that particular cell ID-BSIC/PSC-frequency combination, as well as for the cell ID-BSIC/PSC-frequency combinations stored in the position database that are in geographical proximity to that cell ID).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Farmer et al. by specifically including (b) the first portable RF communication device determining if the monitored location is within proximity to a

location chosen by a user of the first portable RF communication device, by electronically comparing a fingerprint of the monitored location with a fingerprint of the chosen location, wherein the fingerprint of a given location is a group of figures identifying the location which include at least one figure which is an ID within a communication signal received at the given location and at least one figure which is based on a characteristic of a signal received at the location, as taught by Farmer et al., the motivation being in order to ensure that the BSIC/PSC identifier and carrier frequency are that of a known base station with which the MS communicated at an earlier time, rather than that of a base station elsewhere in the world that was not been previously encountered when determining position.

For claim 2, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 1. Furthermore, Phatak et al. disclose wherein the characteristic of a signal at the location is the signal's strength, and the location fingerprint is based on at least one signal strength at the location ([0037] to [0040]).

For claim 3, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 2. Furthermore, Phatak et al. disclose wherein the chosen location fingerprint is based on signal strengths measured by the first portable RF communication device ([0037] to [0040]).

For claim 5, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 2. Furthermore, Farmer et al. disclose wherein the chosen location fingerprint is based on signal strengths originating from a database of geographic locations and corresponding fingerprints ([0042] to [0045]).

For claim 6, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 5. Furthermore, Phatak et al. disclose wherein the database is stored remotely, and not on the first portable RF communication device ([0037] to [0040]).

For claim 7, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 5. Furthermore, Phatak et al. disclose wherein the database is built by a service provider ([0037] to [0040]).

For claim 8, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 5. Furthermore, Farmer et al. disclose wherein the database is built based on multiple locations, where for each location, GPS measurements and signal strength measurements are performed and the IDs of nearby cells are recognized ([0042] to [0045]).

For claim 9, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 8. Furthermore, Farmer et al. disclose wherein at least for some of the locations, signal strength measurements are taken at different times ([0042] to [0045]).

For claim 10, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 8. Furthermore, Farmer et al. disclose wherein the signal strength measurements are taken using a portable RF communication device ([0042] to [0045]).

For claim 11, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 10. Furthermore, Phatak et al. disclose wherein the signal strength measurements or calculation results made using the signal strength measurements, along with the cell IDs, are sent by the portable RF communication device to a server responsible for building the database of geographic locations and corresponding fingerprints ([0037] to [0040]).

For claim 12, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 5. Furthermore, Farmer et al. disclose the chosen location fingerprint is taken from the database of geographic locations and corresponding fingerprints using a geographic location entered by the first portable RF communication device user as his chosen location ([0042] to [0045]).

For claim 13, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 5. Furthermore, Farmer et al. disclose wherein the chosen location fingerprint, which corresponds with a geographical location chosen by the first portable RF communication device user, is the result of extrapolating the fingerprints of locations in the database of geographic locations and corresponding fingerprints ([0042] to [0045]).

For claim 14, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 5. Furthermore, Farmer et al. disclose wherein the chosen location fingerprint, which corresponds with a geographical location chosen by the first portable RF communication device user, is taken from the database of geographic locations and corresponding fingerprints, said database being built using computational closure ([0042] to [0045]).

For claim 15, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 1. Furthermore, Phatak et al. disclose wherein the at least one ID is a cell ID ([0037] to [0040]).

For claim 16, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 1. Furthermore, Phatak et al. disclose wherein the first portable RF communication device is a mobile phone ([0037] to [0040]).

For claim 17, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 1. Furthermore, Phatak et al. disclose wherein the first portable RF communication device is a ubiquitous computer ([0037] to [0040]).

For claim 18, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 1. Furthermore, Phatak et al. disclose wherein the characteristic of a signal at the location is the signal's strength, and the location's fingerprint comprises at least one signal strength at the location of signals broadcasted by nearby cell towers and the ID of at least one of the cell towers ([0037] to [0040]).

For claim 19, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 1. Furthermore, Farmer et al. disclose wherein a location's fingerprint comprises at least one relation between signal characteristics at the location of signals broadcasted by nearby cell towers and the ID of at least one of the cell towers ([0042] to [0045]).

For claim 20, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 19. Furthermore, Phatak et al. disclose wherein the characteristic of a signal at the location is the signal's strength (Abstract).

For claim 21, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 1. Furthermore, Farmer et al. disclose wherein the characteristic of a signal at the location is the signal's strength, and the location's fingerprint is the result of a calculation using signal strengths ([0004] and [0042]-[0060]).

For claim 22, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 1. Furthermore, Farmer et al. disclose wherein the characteristic of a signal at the location

is the signal's arrival time, and the location's fingerprint comprises at least one arrival time at the location of a signal broadcasted by nearby cell towers and the ID of at least one of the cell towers ([0004] and [0042]-[0060]).

For claim 23, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 1. Furthermore, Farmer et al. disclose wherein the characteristic of a signal at the location is the signal's phase, and the location's fingerprint comprises at least one phase at the location of signals broadcasted by nearby cell towers and the ID of at least one of the cell towers ([0004] and [0042]-[0060]).

For claim 24, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 1. Furthermore, Phatak et al. disclose wherein the monitoring step comprises `low accuracy monitoring` ([0037] to [0040]). Farmer et al. disclose wherein the monitoring step comprises `high accuracy monitoring` ([0004] and [0042]-[0060]).

For claim 25, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 24. Furthermore, Phatak et al. disclose wherein `low accuracy monitoring` includes comparing the cell IDs of the chosen location with the cell IDs of the current location ([0037] to [0040]).

For claim 26, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 25. Furthermore, Phatak et al. disclose wherein `high accuracy monitoring` takes place only if cell IDs of the current location are determined to match cell IDs of the chosen location in the `low accuracy monitoring` step ([0037] to [0040]).

For claim 27, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 1. Furthermore, Farmer et al. disclose wherein `high accuracy monitoring` includes measuring a signal characteristic at the current location ([0004] and [0042]-[0060]).

For claim 28, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 1. Furthermore, Farmer et al. disclose wherein the monitoring step is performed iteratively, with a predetermined time delay between successive iterations such that data from the monitoring step is used only if a substantial portion of the successive measurements are alike within a predetermined threshold ([0004] and [0042]-[0060]).

For claim 29, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 1. Furthermore, Farmer et al. disclose wherein the monitored location of the first portable RF communication device is determined to be within proximity of the chosen location if the difference between measured signal strengths at the monitored location and signal strengths at the chosen location is less than a predetermined threshold ([0004] and [0042]-[0060]).

Regarding claim 30, this claim is rejected for the same reason as set forth in claim 1.

Regarding claim 31, this claim is rejected for the same reason as set forth in claim 18.

Regarding claim 32, this claim is rejected for the same reason as set forth in claim 8.

Regarding claim 33, this claim is rejected for the same reason as set forth in claim 9.

Regarding claim 34, this claim is rejected for the same reason as set forth in claim 10.

Regarding claim 35, this claim is rejected for the same reason as set forth in claim 11.

Regarding claim 36, this claim is rejected for the same reason as set forth in claim 12.

Regarding claim 37, this claim is rejected for the same reason as set forth in claim 13.

Regarding claim 38, this claim is rejected for the same reason as set forth in claim 14.

Regarding claim 39, this claim is rejected for the same reason as set forth in claim 15.

Regarding claim 40, this claim is rejected for the same reason as set forth in claim 19.

Regarding claim 41, this claim is rejected for the same reason as set forth in claim 20.

Regarding claim 42, this claim is rejected for the same reason as set forth in claim 21.

Regarding claim 43, this claim is rejected for the same reason as set forth in claim 22.

Regarding claim 44, this claim is rejected for the same reason as set forth in claim 23.

Regarding claim 45, this claim is rejected for the same reason as set forth in claim 1.

Regarding claim 46, this claim is rejected for the same reason as set forth in claim 1.

8. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Phatak et al. (Pub. No. 20080039114) in view of Farmer et al. (Pub. No. 20100156706) and further in view of Baron et al. (Pub. No. 20050159174).

For claim 2, the combination of Phatak et al. and Farmer et al. disclose all limitations in claim 1. However, the combination of Phatak et al. and Farmer et al. disclose do not teach wherein the chosen location fingerprint is based on signal strengths measured by a second portable RF communication device, different from the first portable RF communication device.

In the same field of endeavor, Bar-On et al. disclose wherein the chosen location fingerprint is based on signal strengths measured by a second portable RF communication device, different from the first portable RF communication device (fig. 1 and abstract, [0008] and [0013]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Farmer et al. by specifically including wherein the chosen location fingerprint is based on signal strengths measured by a second portable RF communication device, different from the first portable RF communication device, as taught by Bar-On et al., the motivation being in order calculate the location of the target MS (N) from information obtained from the received signals.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dai A Phuong whose telephone number is 571-272-7896. The examiner can normally be reached on Monday to Friday, 9:00 A.M. to 5:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on 571-272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Dai A Phuong/
Primary Examiner, Art Unit 2617
Date: 03/23/2011

Notice of References Cited	Application/Control No. 12/720,362	Applicant(s)/Patent Under Reexamination SHKEDI, ROY	
	Examiner DAI A. PHUONG	Art Unit 2617	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2008/0039114	02-2008	Phatak et al.	455/456.1
*	B	US-2010/0156706	06-2010	Farmer et al.	342/357.1
*	C	US-2005/0159174	07-2005	Bar-On et al.	455/456.6
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
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	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

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	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

<i>Index of Claims</i> 	Application/Control No. 12720362	Applicant(s)/Patent Under Reexamination SHKEDI, ROY
	Examiner DAI A PHUONG	Art Unit 2617

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant										☐ CPA										☐ T.D.										☐ R.1.47									
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Final	Original	03/24/2011																																					
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<i>Index of Claims</i> 	Application/Control No. 12720362	Applicant(s)/Patent Under Reexamination SHKEDI, ROY
	Examiner DAI A PHUONG	Art Unit 2617

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47										
CLAIM		DATE								
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	37	✓								
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	43	✓								
	44	✓								
	45	✓								
	46	✓								

Search Notes 	Application/Control No. 12720362	Applicant(s)/Patent Under Reexamination SHKEDI, ROY
	Examiner DAI A PHUONG	Art Unit 2617

SEARCHED			
Class	Subclass	Date	Examiner
455	432.1-442, 456.1-456.3	3/24/11	ad

SEARCH NOTES		
Search Notes	Date	Examiner
Inventor Search	3/24/11	ad

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	33383547	@ad<="20060919" or @rlad<="20060919" or @ptad<="20060919" or @pt1d<="20060919" or @pt3d<="20060919"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 14:16
L2	0	(via near5 (second near3 (mobile \$phone pda portable))) with (table referenc\$4) with (within near5 (proximity range locat\$4 position\$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 14:17
L3	55	((second near3 (mobile \$phone pda portable))) with (table referenc\$4) with (within near5 (proximity range locat\$4 position\$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 14:18
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L6	62	((second near3 (mobile \$phone pda portable))) near12 (measur \$4) with ((determin\$4 comput \$4) near5 (proximity range locat \$4 position\$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 14:22
L7	53	1 and 6	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 14:23
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L9	39	(SHKEDI near2 ROY).in.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 15:29

L10	8	(SHKEDI near2 ROY).in. and (id).clm.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 15:30
L11	3	(SHKEDI near2 ROY).in. and (rf same locat\$4).clm.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 15:31
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S4	2	"7057556".pn.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 11:48
S5	2	"7050786".pn.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 11:49
S6	2	"6972717".pn.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 11:54
S7	0	"200900031006"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 11:55
S8	2	"20090031006"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 11:55
S9	3	"20070232322"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 11:55

S10	2	"20080039114"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 12:04
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S13	0	S3 and S12	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 12:23
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S15	163	S12 and S14	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 12:24
S16	6	"7706975".pn.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 12:29
S17	1	12/720362	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 12:41
S18	2	"20080039114"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/03/24 12:44

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CONFIRMATION NO. 8899

SERIAL NUMBER 12/720,362	FILING or 371(c) DATE 03/09/2010 RULE	CLASS 455	GROUP ART UNIT 2617	ATTORNEY DOCKET NO. B030910		
APPLICANTS Roy Shkedi, New York, NY; ** CONTINUING DATA ***** This application is a CON of 11/533,238 09/19/2006 PAT 7,706,811 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED *** SMALL ENTITY ** 03/17/2010						
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☒ No Verified and /DAI PHUONG/ Acknowledged Examiner's Signature		☐ Met after Allowance Initials	STATE OR COUNTRY NY	SHEETS DRAWINGS 1	TOTAL CLAIMS 46	INDEPENDENT CLAIMS 4
ADDRESS JOHN ALEXANDER GALBREATH 2516 CHESTNUT WOODS CT REISTERSTOWN, MD 21136 UNITED STATES						
TITLE Signal Comparison-Based Location Determining Method						
FILING FEE RECEIVED 1248	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit			

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Application Number	N/A (Continuation of 11/533,238)
Filing Date	
First Named Inventor	Shkedi, Roy
Art Unit	
Examiner Name	
Attorney Docket Number	

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number - Kind Code ² (if known)			
D.P.		US- 7057556	6/6/06	Hall	
		US- 7050786	5/23/06	Caci	
		US- 6972717	12/6/05	Sollenberger	
		US- 6674403	1/6/04	Gray	
D.P.		US- 2009-0031006	01/09	Johnson	
		US- 2007-0232322	10/07	Jagadeesan	
		US- 2008-0039114	02/08	Phatak	
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FOREIGN PATENT DOCUMENTS

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		Country Code ³ - Number ⁴ - Kind Code ⁵ (if known)				
D.P.		EP12419093	09/18/2002	L.M. Ericsson		

Examiner
Signature

/Dai Phuong/

Date
Considered

03/24/2011

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Application Number	N/A (Continuation of 11/533,238)																
Filing Date																	
First Named Inventor	Shkedi, Roy																
Group Art Unit																	
Examiner Name																	
Attorney Docket Number																	
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/D.P./		Motorola, Inc., Overview of 2G LCS Technologies and Standards (3GPP TSG SA2 LCS Workshop LCS-010019 - London, UK, 11 - 12 January 2001).	
/D.P./		Y. Zhao, "Mobile Phone Location Determination and Its Impact on Intelligent Transportation Systems," IEEE Transactions on Intelligent Transportation Systems, vol. 1, no. 1, pp. 55-64, Mar. 2000.	
/D.P./		A Survey and Taxonomy of Location Systems for Ubiquitous Computing - by Jeffrey Hightower and Gaetano Borriello (Technical Report UW-CSE 01-08-03).	
/D.P./		SpotON: An Indoor 3D Location Sensing Technology Based on RF Signal Strength - by Jeffrey Hightower and Gaetano Borriello - (UW CSE Technical Report #2000-02-02).	

Examiner Signature	/Dai Phuong/	Date Considered	03/24/2011
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/720,362	03/09/2010	Roy Shkedi	B030910

CONFIRMATION NO. 8899

PUBLICATION NOTICE

24271
JOHN ALEXANDER GALBREATH
2516 CHESTNUT WOODS CT
REISTERSTOWN, MD 21136



OC000000042266348

Title:Signal Comparison-Based Location Determining Method

Publication No.US-2010-0159951-A1

Publication Date:06/24/2010

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
12/720,362	03/09/2010	2617	1248	B030910	46	4

CONFIRMATION NO. 8899

24271

JOHN ALEXANDER GALBREATH
2516 CHESTNUT WOODS CT
REISTERSTOWN, MD 21136

FILING RECEIPT



0000000040666191

Date Mailed: 03/18/2010

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Roy Shkedi, New York, NY;

Power of Attorney: The patent practitioners associated with Customer Number 24271

Domestic Priority data as claimed by applicant

This application is a CON of 11/533,238 09/19/2006

Foreign Applications

If Required, Foreign Filing License Granted: 03/17/2010

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/720,362**

Projected Publication Date: 06/24/2010

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

Signal Comparison-Based Location Determining Method

Preliminary Class

455

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/720,362	03/09/2010	Roy Shkedi	B030910

24271
JOHN ALEXANDER GALBREATH
2516 CHESTNUT WOODS CT
REISTERSTOWN, MD 21136

CONFIRMATION NO. 8899
POA ACCEPTANCE LETTER



Date Mailed: 03/18/2010

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

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UTILITY PATENT APPLICATION TRANSMITTAL

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Attorney Docket No.

First Inventor

Shkedi, Roy

Title

Signal Comparison-Based
Location Determining Method

Express Mail Label No.

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. ☐ Fee Transmittal Form (e.g., PTO/SB/17)
(Submit an original and a duplicate for fee processing)
2. ☒ Applicant claims small entity status.
See 37 CFR 1.27.
3. ☒ Specification [Total Pages 72]
(preferred arrangement set forth below)
 - Descriptive title of the invention
 - Cross Reference to Related Applications
 - Statement Regarding Fed sponsored R & D
 - Reference to sequence listing, a table, or a computer program listing appendix
 - Background of the Invention
 - Brief Summary of the Invention
 - Brief Description of the Drawings (if filed)
 - Detailed Description
 - Claim(s)
 - Abstract of the Disclosure
4. ☒ Drawing(s) (35 U.S.C. 113) (7 figures on 1 sheet) [Total Sheets 1]
5. Oath or Declaration [Total Pages 2]
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Copy from a prior application (37 CFR 1.63 (d))
 - b. ☐ (for continuation/divisional with Box 18 completed)
 - i. ☐ **DELETION OF INVENTOR(S)**
Signed statement attached deleting inventor(s)
named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
6. ☐ Application Data Sheet. See 37 CFR 1.76

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ACCOMPANYING APPLICATION PARTS

9. ☒ Assignment Papers (cover sheet & document(s))
10. ☐ 37 CFR 3.73(b) Statement (when there is an assignee) ☒ Power of Attorney
11. ☐ English Translation Document (if applicable)
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13. ☐ Preliminary Amendment
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☒ Continuation ☐ Divisional ☐ Continuation-in-part (CIP)

of prior application No.: 11/533,238

Prior application information:

Examiner Dai Phuong

Group Art Unit: 2617

For CONTINUATION OR DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

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Name

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John A. Galbreath

Registration No. (Attorney/Agent)

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/John A. Galbreath/

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TITLE OF THE INVENTION

Signal Comparison-Based Location Determining Method

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation of application Ser. No. 11/533,238, filed on September 19, 2006 and entitled "Signal Comparison-Based Location Determining Method". The disclosures of said application and its entire file wrapper (included all prior art references cited therewith) are hereby specifically incorporated herein by reference in their entirety as if set forth fully herein. Furthermore, a portion of the disclosure of this patent document contains material which is subject to copyright protection. The copyright owner has no objection to the facsimile reproduction by anyone of the patent document or the patent disclosure, as it appears in the Patent and Trademark Office patent file or records, but otherwise reserves all copyright rights whatsoever.

TECHNICAL FIELD

The present invention generally relates to methods for determining the location of a mobile telephone, or of a mobile communications device. More specifically, the present invention relates to a method for determining the location of a mobile telephone, wherein the mobile telephone is preferably capable of performing measurements of signal characteristics deriving from signals being received from mobile telephone service area antennas, of performing calculations related thereto, and of storing these measurements

and/or calculation results.

BACKGROUND ART

Simply stated, there is a longstanding problem of providing high accuracy location data for mobile devices, such as mobile telephones. In the most critical aspect, the problem is to maintain user privacy of precise location data of the mobile telephone user.

Nevertheless, there also remains a need in the art for simple straightforward improvements in determining the precise location of mobile devices; especially in poor signal-reception locations such as in dense multi-story urban centers. Furthermore, there is a need in the art for providing an elevation component to location data, so as to locate a device in a multi-story structure.

Motorola, Inc., Overview of 2G LCS Technologies and Standards (3GPP TSG SA2 LCS Workshop LCS-010019--London, UK, 11-12 Jan. 2001)--discusses why locating mobile phones becomes a hot topic in telecommunications industry, and what technologies are being studied and standardized.

Y. Zhao, "Mobile Phone Location Determination and Its Impact on Intelligent Transportation Systems," IEEE Transactions on Intelligent Transportation Systems, vol. 1, no. 1, pp. 55-64, Mar. 2000.--provides more information on different location technologies and related location services.

There are many location-determining methods used to determine the location of a cell phone. These methods differ in the level of accuracy they provide as well as their implementation. In general these methods could be divided into methods that involve the cellular network participation and those that don't (handset based only).

Methods that involve the cellular network participation include:

Cell-ID

TDOA--Time Difference Of Arrival

TOA--Time Of Arrival

AOA--Angle Of Arrival

EOTD--Enhanced Observed Time Difference

A-FLT--Advanced Forward Link Trilateration

A-GPS--Assisted GPS (Global Positioning System)

Methods that rely solely on the handset to determine its position:

GPS--Global Positioning System

Expect Cell-ID where the location of the handset is simply determined to be within the area of the cell, where the cell's base station location is known and the accuracy depends on the size of the cell (accuracy of anywhere between 100 meter and 3,000 meters) all other methods require different levels of calculations either by the network or the handset or both.

A substantially similar field where virtually the same class of location based need arise is in the area of ubiquitous computing. Essentially, with respect to location based applications, the primary difference between the mobile telephony and ubiquitous computing relates to privacy--since the mobile telephone user might prefer not to allow his location to be monitored, while privacy is a non-issue for a ubiquitous computer attached to a box in a large warehouse or to a piece of luggage in an airport customs clearance center or to a semi-assembled component in a multifaceted manufacturing facility or to a semiautonomous vehicle in a recreation center, etc.

A Survey and Taxonomy of Location Systems for Ubiquitous Computing--by Jeffrey Hightower and Gaetano Borriello (Technical Report UW-CSE 01-08-03)--"Emerging mobile computing applications often need to know where things are physically located. To meet this need, many different location systems and technologies have been developed. In this paper we present the basic techniques used for location-sensing, describe a taxonomy of location systems, present a survey of research and commercial

location systems that define the field, show how the taxonomy can be used to evaluate location-sensing systems, and offer suggestions for future research. It is our hope that this paper is a useful reference for researchers and location-aware application builders alike for understanding and evaluating the many options in this domain."

SpotON: An Indoor 3D Location Sensing Technology Based on RF Signal Strength--by Jeffrey Hightower and Gaetano Borriello--(UW CSE Technical Report #2000-02-02)

"Providing a reliable technology and architecture for determining the location of real world objects and people will undoubtedly enable applications, customization, and inference not currently possible. This paper documents the creation of SpotON, a new tagging technology for three dimensional location sensing based on radio signal strength analysis. Although there are many aspects to the topic of location sensing and several of them will be briefly discussed, this paper is primarily concerned with the hardware and embedded system development of such a system."

For many mobile telephone location based services, constant calculation of a user's handset location is required. For example, if a user asked to receive food coupons whenever he enters a specific area or to be informed if a child carrying a cell phone left a certain perimeter around the house, or if the user asked for a group call to his cell phone and home phone every time that he is at home; in order to give him the option to answer calls to his cell phone on his landline.

From a network perspective, in an anticipated emerging world where Location Based

Services (LBS) are expected to be widely used and of those services many require constant monitoring of a user's cell phone location, those methods will require the networks to have a lot of infrastructure dedicated to the determination of handsets' locations.

From a privacy perspective, having the cellular network constantly monitor a user's location is problematic to many people. For example, the user asked to receive coupons for merchandise on sale when he is in the shopping area next to his home. However, that same user is troubled by a prospect that, in order for the coupons to be sent, the user's location must be constantly monitored so as to find out when he enters the shopping area.

Obviously the privacy problem could be solved by having the cell phone itself monitor its position, and activate an application when the cell phone concludes that the user has entered the shopping area, etc. This class of solution is also amenable for adaptation to ubiquitous computing situations--since it simply makes the location monitoring logic part of a distributed computing architecture.

Having the cell phone monitor its position will also significantly reduce the infrastructure required by the cellular network to determine the location of handsets. This is also true in ubiquitous computing applications.

Currently a cell phone can determine its geographical location by using a GPS receiver. The challenges with using a GPS in a handset--is that GPS require significant

calculations that takes time, up to several minutes; it is difficult to get GPS signals in dense urban areas; and GPS does not distinguish between different elevations at the same location. Thus, in our shopping area example, GPS would not distinguish between entering a large department store from entering a shopping center plaza in a floor below or entering a professional service office in a floor above.

A-GPS (Assisted-GPS), which is intended to reduce the time it takes to determine a location as well as possibly calculate the location in the network in order to reduce the complexity required from the cell phone, once again requires the network.

Using Cell-ID by the cell phone is limited as a cell area location resolution is not good enough for most location based applications. On the ubiquitous computing side, division of large areas into micro-cells presents a substantially similar location accuracy threshold.

There are, of course, numerous patents that have contributed to progress in this art--especially in the field of cellular telephones--most especially since there is an ongoing attempt to reach compliance with regulations calling for instant automatic location reporting for cellular telephone users requesting emergency services (police, ambulance, fire department, etc.).

U.S. Pat. No. 7,057,556--Method And Apparatus For Geolocating A Wireless Communications Device--"The time difference of arrival for a signal received at two or more receiving sites as transmitted from a wireless communications device, is determined

by a frequency domain technique. The constituent frequencies of the signals received at the two or more receiving sites are determined, including the phase, or a value representative of the phase, of each frequency component. The phase values for the same frequency are subtracted to yield a phase difference values as a function of frequency. The slope of the function represents the time difference of arrival for the wireless communications device signal as received at the two receiving sites. To determine the mobile location based on the determined time difference of arrival values, a seed or initial location is first assumed for the wireless communications device and the distance difference of arrival (the time difference of arrival multiplied by the speed of light) is calculated. The calculated time difference of arrival is then used to adjust the distance difference of arrival by continuously iterating the position of the wireless communications device until the calculated distance of arrival and the calculated time difference of arrival (as multiplied by the speed of light) are within a predetermined margin."

U.S. Pat. No. 7,050,786--Method And Apparatus For Locating A Wireless Device--

"Disclosed is a method and apparatus for locating a wireless device especially useful for locating a cellular telephone making a call from an unknown location. The call may be a request for emergency assistance, or for location-based commercial services, for example. Various embodiments may optionally include a mobile location component, a cellular telephone enabled to chirp-on-demand, and/or an interferometer link. A mobile location component may include a directional antenna. The directional antenna may be mounted on an antenna boom on top of an emergency vehicle, for example. The mobile

location component may alternately or additionally comprise a hand-held unit. System elements may cooperate to generate a situation awareness map or other display. The mobile location component may be moved in the general direction of a first location calculation associated with a first circular error of probability. After being moved in the general direction, the mobile location component may cooperate with other elements to determine a second location calculation associated with a second circular error of probability. Second and subsequent location calculations are of increasing precision, enabling an emergency vehicle or attendant to zero in on a cellular telephone."

U.S. Pat. No. 6,972,717--Method And Apparatus For Enhanced 911 Location Using Power Control In A Wireless System--"A method of locating a mobile telephone includes steps of receiving, transmitting, increasing and determining. In the receiving step, a first base station receives a call from a mobile telephone, the call including a dialed number and a TDMA signal. In the transmitting step, the base station transmits a control message to the mobile telephone when the dialed number meets a predetermined criterion, such as being 911. The control message instructs the mobile telephone to transmit the TDMA signal at a maximum power. In the increasing step, the mobile telephone increases the TDMA signal to maximum power in response to the control message. Then in the determining step, location information for the mobile telephone is determined based on at least one characteristic of the TDMA signal received at at-least one of the first base station and other base stations. In an alternate embodiment, the method is practiced in a mobile telephone and the power level is automatically increased in response to the dialed number meeting a predetermined criterion."

U.S. Pat. No. 6,674,403--Position Detection And Location Tracking In A Wireless Network--"A system and method for performing real-time position detection and motion tracking of mobile communications devices moving about in a defined space comprised of a plurality of locales is provided. A plurality of access points are disposed about the space to provide an interface between mobile devices and a network having functionality and data available or accessible there-from. Knowledge of adjacency of locales may be used to better determine the location of the mobile device as it transitions between locales and feedback may be provided to monitor the status and configuration of the access points."

EP 1241909--Method And Computer Readable Medium For A Program For Location Determination Of A Mobile Terminal--"A method for location determination of a mobile terminal by means of radio connections which are controlled by a common server, characterized by providing a least one pair of different radio zones closely spaced from each other so that distinct directional information transversely to a boundary between the pair of radio zones is provided upon recording of the movement of the mobile terminal in the zones. Furthermore, preferably characterized in that a pair of radio zones comprises a first zone and a second zone, and that information is stored in the server defining that the mobile unit is present on one side of said boundary if the mobile unit is first recorded in the second zone and then in the first zone, and defining that the mobile unit is present on the other side of said boundary if the mobile unit is first recorded in the first zone and then in the second zone."

The challenges, therefore, are to develop a location-determining method that would: (A) Take place on the cell phone for the benefit of privacy (monitoring of user location by the cell phone and not by the cellular network) as well as in order to reduce the infrastructure required by the cellular network to determine cell phone locations; (B) Will not require heavy calculations by the cell phone in order to be able to determine a location fast and with minimal resources so the method be suitable for cheap handsets and not only expensive handsets with capabilities to perform heavy calculations; and (C) Provide accurate enough location determination.

Simply stated, there is a need for performing geographical location determinations with ordinary RF communications hardware (without GPS capability) because that is less expensive than performing the same determination with GPS hardware components. Furthermore, there is another independent need to perform location determinations within a scope of privacy to the user--in order for him to permit application events that depend on location. There is also a need for location determination in locations where GPS reception is problematic. In addition, there is a need for determining elevation components of location without the addition of additional hardware--especially for devices that are already GPS capable. Likewise, for both cellular telephony and the ubiquitous computing arts there is a need to provide elevation location data and/or to reduce infrastructure intensive application for location determination, progress in at least one of these areas would constitute a meaningful contribution to alleviating a longstanding need in the art; and would set the stage for the progress of further location-

knowledge-dependent applications.

DISCLOSURE OF INVENTION

The aforesaid longstanding needs are significantly addressed by embodiments of the present invention, which specifically relates to a Signal-Comparison Based Location-Determining Method. The instant method is especially useful in telecommunications and/or ubiquitous computing applications wherein there exists a need to provide improved privacy, and/or to provide elevation location data, and/or to reduce infrastructure intensive application for location determination.

The instant invention relates to embodiments of a Signal-Comparison Based Location-Determining Method, operable by at least one portable RF communications device in conjunction with at least two fixed-location service-area antenna stations respectively capable of RF communication with the at least one device wherein the stations are substantially continuously operating, and the method is comprising the steps of:

(A) Registering a selected location by first-causing a portable RF communications device at the selected location (i) to receive an RF communications signal from a plurality of local fixed-location service-area antenna stations, and (ii) to measure reception signal strength respectively associated with the received signal from at least two of the plurality of antenna stations;

(B) Recording the selected location by electronically storing at least two of the respective reception signal strength measurements;

(C) Monitoring by second-causing a portable RF communications device (i) to receive communications signals from a plurality of respectively local fixed-location service-area antenna stations, and (ii) to measure reception signal strength associated with the signals; and

(D) Determining if the portable RF communications device of the Monitoring step is at the selected location of the registering step by electronically comparing measurements in the monitoring step with the stored at least two measurements of the Recording step.

According to a simpler categorization, the instant invention relates to a methodological embodiment (see FIG. 1) whereby at least one portable RF communications device in conjunction with at least two fixed-location service-area antenna stations respectively capable of RF communication with the at least one device perform the steps of: -100-(I) using a portable device at a selected location to measure RF communications signals from the plurality of local fixed-location service-area antenna stations and electronically storing at least two of the respective reception signal strength measurements; and -110-(II) Monitoring a portable device location by causing the device to measure reception signal strength associated with local fixed-location service-area antenna stations signals, and to electronically compare these measurements with the stored at least two measurements.

Please note, the present invention is herein described with a certain degree of particularity, however those versed in the art will readily appreciate that various modifications and alterations may be carried out without departing from either the spirit or scope, as hereinafter claimed. For example, the majority of the description relates to direct measurements of signal strengths and direct comparisons of those measurements. Such direct measurements are generally correct in a cellular telephone GSM environment, however in a cellular telephone CDMA environment it is the relative signal strengths that form an important metric for comparative purposes. Similarly, for other antenna space environments, measurements and comparisons thereof should conform to the underlying policy that governs the management of antenna space signal strength management--or of equivalent antenna space transmission metric characteristics. For example, a strongest signal may be used as a unit to help normalize other simultaneous measurements; however, since that strongest signal may encounter inoperative events or radical environmental changes (e.g. construction of a signal blocking structure between the "strong" antenna and the reception location), one would prefer to retain a capability to renormalize measurements within the context of the instant method.

Simply stated, a conceptually instant enabling embodiment of the present invention is a cellular telephone device that looks at the signal strengths (and preferably corresponding local base station service area antenna IDs) to characterize an antenna space signal-reception signature as being substantially equivalent to a current location. The device needs a means for remembering this signal strength (preferably with the antennas' IDs),

and this means may be on the device per se, kept at a remote storage (or even transferred from the current device to the owner's next cell phone). The device can "know" that it has returned to the original location where the signal strengths were measured (and the antennas' IDs preferably captured). Since the device is capable of receiving and measuring such signals, the device simply performs such reception measurements and compares these measurements with the remembered signal strength combinations. Whenever there is a substantial equivalence between the remembered signal strengths (and IDs) and the currently being monitored signal strengths (and IDs), then the device can conclude that it is probably at the original location where the original measurements were performed.

Now, illustrative enabling embodiments of a Signal-Comparison Based Location-Determining Method of the instant invention--according to a simplified aspect--substantially relate to a method for determining a cell phone (or a ubiquitous computer) location comprising: (A) at a desired location--Causing a cell phone (or a ubiquitous computer) to measure signal strengths from surrounding cells and to record the signal strengths measured by the cell phone (or the ubiquitous computer) from the surrounding cells; (B) at a current location--Causing a cell phone (or a ubiquitous computer) to measure the signal strengths from surrounding cells; and (C) Causing the Cell phone (or ubiquitous computer) to compare the measured signal strengths from surrounding cells at the current location with the recorded signal strengths from surrounding cells at the desired location in order to determine whether the cell phone or the ubiquitous computer of the present location is also at the desired location.

Today, given our technological orientations, one's normal concept of location combines some small number of quantitative coordinates according to some consistent coordinate system. Typically location is described by a Cartesian intersection of latitude and longitude; and sometimes including elevation too. Elsewhere, location is described by triangulation from two known positions. Nevertheless, when desiring to express the location of a mobile telephone (i.e. cellular telephone, "tell phone", pager, area wide wireless telecommunications apparatus, blackberry, ubiquitous computer, or the likes), the ability to capture precise longitude, latitude, or angular measurements become calculation intensive--well beyond the economic value of their engineering precision; most particularly if these calculations must be performed on the mobile telephone.

Now, the instant invention takes note of an additional ergonomic parameter, typical of mobile telephones, which greatly simplifies these calculations; perhaps even increasing the accuracy of the resultant location specification. Let's start with a simplest example; a mobile telephone is in the possession of a resident of a small house, which is in a sparsely populated rural environment. By the very nature of this situation, that small house probably only falls within the antenna coverage of a single cellular telephone service providing antenna. Accordingly, if the cell-phone captures a distance equivalent measurement between itself (when located in that small house) and the area service antenna, then one would expect that this measurement simply describes a constant radius distance around the service antenna. Accordingly, from a strict scientific perspective, whenever the cell-phone measures that it is at that radius distance from the service

antenna, it can only logically presume that the probability of it also being in that small house is substantially proportional to the fragment of arc that the house represents with respect to the circumference specified by that radius.

OK, now if the owner of the cell-phone is a tractor driver who typically continuously drives back and forth across the length and breadth of the service antenna coverage area, then the presumed probability that the cell-phone radius measurement corresponds to him being in that house is as described. However, if he is in that house an average of eight hours per day, then there is already a high probability that the radius measurement from the cell-phone indicates that he is in the house. More likely, the cell-phone owner is not an indentured round-the-clock tractor driver, but an ordinary vehicle commuter who goes from that house to various other locations, using established paved roads. This being the case, there are perhaps four to six locations where these roads coincide with that radius measurement, and it is only of minimal probability that a part of one of those roads follows that circumference for any span or that the cell-phone owner parks his vehicle at such a location. Accordingly, there is an already very high probability that the radius measurement from the cell-phone indicates that he is in the house.

One can easily provide a significant increase in this already very high probability by delaying confirmation of the measurement calculation--at least until it is performed at least twice. Specifically, to eliminate spurious observation of the cell-phone owner traversing at that circumference, one need only wait to see that the same measurement had been made twice with perhaps a 2-3 minute interval wait there-between. That interval

would be enough to edit out occurrence of the cell-phone owner stopping or driving over (or along) the circumference; or stopping at some incidentally located traffic light, etc.

Moving on to a slightly more realistic scenario, the house is located in a rural environment (see FIG. 2) where there are occasional clusters of buildings and three service antennas -200- -210- -220- such that there is a 40% probability of a building being in the coverage area of a single service antenna, a 40% probability of a building being in the overlapping coverage area of two service antennas, and a 20% probability of a building being in the overlapping coverage area of three service antennas. In this instance, the cell-phone captures respective distance equivalent measurement(s) between itself (when located in that small house) and each of area service antenna(s). In order to make this example more simplistic, one can say that the cell-phone ignores any distance equivalent measurement (e.g. service antenna signal strength as measured at the mobile device, arrival times or phases of signals arriving from surrounding cells, or the likes) below a predetermined threshold. Now in this example, there is yet a substantially higher probability that a confluence of the captured radius measurement(s) from the cell-phone indicate that he is in the house.

However, instead of the simplistic assumption, that we only consider distance equivalent measures for service antenna signals that are capable of providing a reasonable quality of service to the mobile telephone unit, we substitute a more realistic assumption-- specifically that we consider distance equivalent measures from service antenna signals that are discretely recognizable (i.e. where the service antenna ID is non-ambiguously

recognizable with the signal that the mobile telephone receives from the respective antenna). Now, for almost every rural, suburban, and urban location where there is mobile telephone service provided--the mobile telephone will be able to equate its current position with a unique coordinate signature comprising at least one (but preferably a plurality of) identifiable service antennas and their respective distance equivalent measurement there-from, as appreciated from their respective signal strengths (or like metrics).

Simply stated, if a mobile telephone (at a user selected location) measures a plurality of service antenna signals and stores these with their respective service antenna identifications, then that mobile telephone (or an equivalent unit) upon observing an identical list of service antennas with substantially identical respective signal strengths--can reasonably conclude that it is within a predetermined proximity of the original user selected location. We will call the coordinate of the user selected location a "fingerprint"--because we believe that each such location has (associated with it) a substantially unique combination of service antenna identifications with respective distance equivalent measurements (e.g. service antenna signal strength as measured at the mobile device, arrival times or phases of signals arriving from surrounding cells as measured by the mobile device, or the likes).

For practical purposes, the fingerprint should carry substantially about the same probability of ambiguity between all combinations of two region-similar physical locations (having the "same" fingerprint) as the Global Positioning System (GPS). Recall

that GPS has a nominal probability of giving biased reading (false reading)--especially in the locations near where GPS will give no reading whatsoever--such as inside building or in dense urban areas or in steep mountain gorges, etc. Specifically, GPS will fail to give a proper coordinate reading whenever it can not simultaneously locate three positioning satellites. However, under a different (but similarly improbable combination of circumstances), the fingerprint concept of the instant invention may fail to provide adequate location recognition (ambiguity). Our first order suspicion is that the fingerprint concept will be at least as good (over a large collection of urban, suburban, and semi-rural settings) as the GPS system--albeit the fingerprint location concept does not require the special hardware of GPS Systems (antenna & computation hardware). Accordingly, for an equal quality of service, it is reasonable to suggest that the fingerprint concept embodiments will always be less costly than equivalent GPS embodiments.

These respective distance equivalent measurements are generally not adequate for direct triangulation calculation from the known positions of the service antennas--because in mountainous regions and more particularly in urban landscapes, the signal strength is a function of the convolutions of the signal path length and of the absorption or reflection of materials encountered there-between. Nevertheless, since service providers generally measure ground truth to locate shadow spots and the likes, the accumulation of GPS coordinates in association with location fingerprints--will eventually create adequate computational closure for the provision of transformations between fingerprints and standard geographical map coordinates--via an intermediate fingerprint "terrain" map database.

Intentionally, cell phones including both a GPS and the instant invention method could help build such a database. The GPS would be used to identify a desired location for the first time and the signal strength fingerprint will be used to recognize the desired location from that point in time and onwards). In a practical application, this means that a mobile telephone calling an emergency number (police, fire, ambulance, etc.) and transmitting the fingerprint that it currently records--should thereby provide the emergency response with adequate information to transform the fingerprint into a real world location and to arrive at same. Thus, until there is substantially complete closure in the construction of "fingerprint" topological database maps, a fingerprint supplemented GPS reporting to emergency services would provide a best opportunity embodiment for those services to locate the caller.

Furthermore, because service antennas are generally not located at identical elevations (nor coplanar); and the elevation of service antennas is known, Thus, measuring at two locations, having identical latitude and longitude but differing in elevation, will not yield identical fingerprints. This is a significant advancement over GPS, which is generally elevation insensitive for location determination (i.e. differentiating between floors of a multi-story building, shopping center, or the likes).

Now, according to more heuristic variant embodiments of the instant invention, the mobile telephone will generally measure and record a greater than necessary plurality of service antenna identifiers with their respective distance equivalent metrics. Thereafter,

when the mobile telephone monitors its respective present location in service area antenna signal strength space (or the likes), then finding a correlation with a majority of such measurements in a single record will lead the device to logically conclude that there is a high probability that this is the location of that measurement--albeit that there is perhaps a new building between the current location and one or more of the proximate service area antennas. Accordingly, the device may build up an evolving description to characterize a known location. Similarly, the device may normalize the measurements in each record or develop pair wise combinations of relationships between measurements of a single record--thereby opening the variation embodiment wherein a different mobile telephone may use this same data; which in turn allows the user of this mobile telephone to transfer his collection of records to another device that may not identically measure service antenna characteristics.

BRIEF DESCRIPTION OF THE DRAWINGS

In order to understand the invention and to see how it may be carried out in practice, embodiments including the preferred embodiment will now be described, by way of non-limiting example only, with reference to the accompanying drawings. Furthermore, a more complete understanding of the present invention and the advantages thereof may be acquired by referring to the following description in consideration of the accompanying drawings, in which like reference numbers indicate like features, and in which an embodiment "name" is only for purposes of helping a reader to differentiate between embodiments and among various groups of aspects and/or variations therein, and

wherein:

FIG. 1 illustrates a schematic view of a "methodological" embodiment;

FIG. 2 illustrates a schematic view of an antenna space reception map

FIG. 3 illustrates a schematic view of a "basic" embodiment;

FIG. 4 illustrates a schematic view of a "first appurtenance" embodiment

FIG. 5 illustrates a schematic view of a "second appurtenance" embodiment;

FIG. 6 illustrates a schematic view of a "system" embodiment;

FIG. 7 illustrates a schematic view of an "illustrative enabling" embodiment

MODES FOR CARRYING OUT THE INVENTION

Embodiments and aspects of the instant invention may be embodied in various forms, wherein a Basic embodiment (see FIG. 3) of the instant invention relates to A Signal-Comparison Based Location-Determining Method, operable by at least one portable RF communications device in conjunction with at least two fixed-location service-area antenna stations respectively capable of RF communication with the at least one device

wherein the stations are substantially continuously operating, and the method is comprising the steps of: (A) Registering -300- a selected location by first-causing a portable RF communications device at the selected location (i) to receive an RF communications signal from a plurality of local fixed-location service-area antenna stations, and (ii) to measure reception signal strength respectively associated with the received signal from at least two of the plurality of antenna stations; (B) Recording -310- the selected location by electronically storing at least two of the respective reception signal strength measurements; (C) Monitoring -320- by second-causing a portable RF communications device (i) to receive communications signals from a plurality of respectively local fixed-location service-area antenna stations, and (ii) to measure reception signal strength associated with the signals,; and (D) Determining -330- if the portable RF communications device of the Monitoring step is at the selected location of the registering step by electronically comparing measurements in the monitoring step with the stored at least two measurements of the Recording step.

Now in greater detail, the Basic instant embodiment is operable by at least one portable RF communications device in conjunction with at least two fixed-location service-area antenna stations respectively capable of RF communication with the at least one device wherein the stations are substantially continuously operating. As is likewise mentioned elsewhere herein, the RF device may be a cellular telephone or a communications enabled ubiquitous computer or any mobile device capable (I) of receiving RF signals and (II) of measuring their respective signal strengths (or of measuring any parameter that is equivalent to signal strength), and of communication (internal or external) with a

module that can store data and can logically and mathematically compare values and therewith arrive at a comparative conclusion between two sets of data. Essentially these sets of data are those created in the storing step and in the monitoring step. Depending on the sophistication of software enabling the comparative conclusion, the operations involved may be simply logical comparisons, arithmetically threshold (rounded) logical comparisons, arithmetic, probabilistic, fuzzy logic, neural network enabled, heuristic, or the likes.

Furthermore, in greater detail, we now turn our attention to the Basic instant embodiment step of: (A) Registering a selected location by first-causing a portable RF communications device at the selected location (i) to receive an RF communications signal from a plurality of local fixed-location service-area antenna stations, and (ii) to measure reception signal strength respectively associated with the received signal from at least two of the plurality of antenna stations. This is a data collection step where the portable device comes to measure the antenna signal space reception characteristics at the selected location. Depending on the sophistication of the specification enablement, one should give priority of "attention" to the strongest signals--since these are probably the most robust for characterizing the antenna space reception signature of this selected location. A highly sophisticated enablement will collect lots of measurement data and then be able to come to viable conclusions using which ever verifiable fraction of that data is reproducible at a subsequent instantiation. A more simplistic approach would be to just take the up to five strongest signals.

Likewise, in greater detail, we now turn our attention to the Basic instant embodiment step of: (B) Recording the selected location by electronically storing at least two of the respective reception signal strength measurements. Storage may be on the device per se or transferred to a remote storage facility. Privacy for a cellular telephone user preferred that the data be stored on the cellular telephone unit, however for other types of device or where privacy is not important (e.g. monitoring luggage or logistics of components in a warehouse or police in the field or the likes) the data may be off loaded. The offloading may be done in real time or may be done in batch at convenient intervals or to testify to the location of the device at a time in question or the likes.

In addition, in greater detail, we now turn our attention to the Basic instant embodiment step of: (C) Monitoring by second-causing a portable RF communications device (i) to receive communications signals from a plurality of respectively local fixed-location service-area antenna stations, and (ii) to measure reception signal strength associated with the signals. Essentially, this step is by first approximation alike in technical detail to the Registering step. However, the monitoring step may be of a different degree of detail to the registering step. For example, the registering step may collect lots of data while the monitoring step collects sparse first order data, and then collects more comprehensive data for the next step (Determining). Essentially, one does not want to dedicate lots of portable device resources to the monitoring activity, so one may divide the monitoring into low accuracy monitoring activities--which just tell the device if there might be anything to seriously compare (such as the surrounding antennas' IDs at the selected location and current location are the same and therefore more resources should be

allocated to the monitoring); and higher accuracy monitoring activity--which takes the necessary resources to make the necessary determining definitive.

Finally, in greater detail, we now turn our attention to the Basic instant embodiment step of: (D) Determining if the portable RF communications device of the Monitoring step is at the selected location of the registering step by electronically comparing measurements in the monitoring step with the stored at least two measurements of the Recording step. Where privacy is of concern then all of the four steps should be performed on a single mobile device. However, in a privacy irrelevant shared data environment, one might even reach the case where Registering is done on a first device, Monitoring is done on a second device, Storing is done in an offsite facility, and Determining is done in a different offsite facility.

According to a first implementation aspect of the Basic embodiment of the Signal-Comparison Based Location-Determining Method, the Registering step includes identifying at least one ID within at least one of the respectively received signals; and the Recording step includes storing each of the at least one IDs with the respective reception signal strength measurement. In the context of this first implementation aspect, it is according to a preferred manifestation that the Monitoring step includes identifying at least one ID within at least one of the respectively received signals and the Determining step includes electronically matching at least one ID of the Monitoring step with the stored at least one ID of the Recording step. Simply stated, while the method may be accomplished without having an ID on every signal, having such an ID would make the

job of concluding, that the current location is the selected location, much easier.

Nevertheless, since ID is not required, then have one or more signals with ID may also provide for logic simplification. In the case of cellular telephony, the ID seems to always be available in service areas. However, in areas plagued by intermittent service problems, sometimes a device will see a signal where the ID is not recognizable. In other applications, the device is not a cellular telephone but does use the cellular base station signals as "landmarks" for registering "location"--so the device might not have the ability to look for an ID even if the ID is clearly visible on the respective signals.

According to a second implementation aspect of the Basic embodiment of the Signal-Comparison Based Location-Determining Method, the Monitoring step includes iteratively performing the sub-steps C.i and C.ii with a predetermined time delay between successive iterations of C.i such that the monitoring step data is used only if a substantial portion of the successive C.ii measurements are alike within a predetermined threshold--since this indicates that the portable RF device of step C is temporally immobile. This returns to our case above, where a driver happens to stop at a traffic light that just resembles a known confluence of signal strengths. However, if the driver does not stay there more than a minute or two, we would conclude that he has not really arrived at the selected location.

According to a third implementation aspect of the Basic embodiment of the Signal-Comparison Based Location-Determining Method, the Determining step includes improving the electronically stored at least two of the respective reception signal strength

measurements of step B by storing at least one measurement of step C therewith--thereby upgrading robustness of the electronically stored measurements. This case relates to creating an ability to improve the correctness of the basic method. For example, in the urban terrain, new building are being built and old ones are being modified while streets are being paved with alternate materials, large billboards are being erected, old antennas are replaced and new ones are added--all of which cause the preferred method to attempt to upgrade the data of the original registering step; and to learn new aspects of the current antenna space environment. Another realistic example is the addition of a cell site and its impact on pre-existing cells.

According to a fourth implementation aspect of the Basic embodiment of the Signal-Comparison Based Location-Determining Method, the Registering step includes accessing a GPS location coordinate for the selected location and Recording step includes keeping the GPS location coordinate with the stored signal strength measurements. This aspect anticipates that a transformational data bank could be created by collecting correspondences between GPS (latitude longitude) coordinates and antenna space reception "coordinates" for the same location. If sufficient correspondence data is collected, then a never registered location can be found by grabbing antenna space reception "coordinates" and extrapolating them within the correspondence set. This would be of great benefit for "911" emergency service location-determining compliance; since locations failing to be able to report GPS could be known from extrapolation using only the reception signature.

According to a fifth implementation aspect of the Basic embodiment of the Signal-Comparison Based Location-Determining Method, the Registering step includes directly transferring the measurements within the portable RF communications device to a storage module therein whereat the Recording step is preformed. By contradistinction, according to a sixth implementation aspect of the Basic embodiment of the Signal-Comparison Based Location-Determining Method, the Registering step includes, via RF communications, transferring the measurements from the portable RF communications device to a storage device whereat the Recording step is preformed; and wherein the Recording step includes, via RF communications, receiving the measurements. Please note that these fifth and sixth aspects are not necessarily mutually exclusive since onboard storage on the device improves response time while offsite storage complements creation of a database of such reception space signatures.

According to a seventh implementation aspect of the Basic embodiment of the Signal-Comparison Based Location-Determining Method the Registering step allows a user to append a designation tag to the registration data--for example--denoting the data to be stored as "Home" or "Office" or "222 East Street" or the likes.

According to an eighth implementation aspect of the Basic embodiment of the Signal-Comparison Based Location-Determining Method, the Determining step includes calculating a confidence metric according to a degree of correlation between the measurements in the Monitoring step with the stored at least two measurements of the recording step. This complements our discussion of evolving signal strength reception

characteristics of the urban landscape; and also complements the detail of the preamble that any specific service area antenna may be taken out of service for repairs, upgrades, and the likes. Thus, it is preferred to introduce statistical comparisons, threshold values, heuristics, and the likes to improve a user's confidence in the accuracy of the determining step result.

Further embodiments and aspects of the instant invention may be embodied in various forms, wherein a first appurtenance embodiment (see FIG. 4) of the instant invention relates to A Signal-Comparison Based Location-Determining Database recorded on a tangible memory media -400- and having recorded thereon signal-strength location correlation data deriving from the Registering step or the Monitoring step of the Signal-Comparison Based Location-Determining Method, the Basic embodiment of the Signal-Comparison Based Location-Determining Method, and to any combination of its eight aforementioned aspects.

Now, additional embodiments and aspects of the instant invention may be embodied in various forms, wherein a second appurtenance embodiment (see FIG. 5) of the instant invention relates to An article of manufacture including a computer usable medium having computer readable program code embodied therein for Signal-Comparison Based Location-Determining, the computer readable program code in said article of manufacture including: (AA) first computer readable program code -500- for causing a computer to Register a selected location by first-causing a portable RF communications device at the selected location (i) to receive an RF communications signal from a

plurality of local fixed-location service-area antenna stations, and (ii) to measure reception signal strength respectively associated with the received signal from at least two of the plurality of antenna stations; (BB) tied to the first computer readable software, second computer readable program code -510- for causing the computer to Record the selected location by electronically storing at least two of the respective reception signal strength measurements; (CC) tied to the second computer readable software, third computer readable program code -520- for causing the computer to Monitor by second-causing a portable RF communications device (i) to receive communications signals from a plurality of respectively local fixed-location service-area antenna stations, and (ii) to measure reception signal strength associated with the signals; and (DD) tied to the third computer readable software, fourth computer readable program code -530- for causing the computer Determine if the portable RF communications device of the Monitoring step is at the selected location of the registering step by electronically comparing measurements in the monitoring step with the stored at least two measurements of the Recording step; and

Finally, please note that embodiments and aspects of the instant invention may be embodied in various forms, wherein a particularly generalized embodiment of the instant invention relates to A Signal-Comparison Based Location-Determining system (see FIG. 6), substantially as herein before described and illustrated, and characterized by using interconnected software enabled modules on at least one portable RF communications device, said modules operating in conjunction with at least two fixed-location service-area antenna stations that are respectively capable of RF communication with the at least

one device wherein the stations are substantially continuously operating, and these software modules include: (A) a registration module -600- for Registering a selected location by first-causing a portable RF communications device at the selected location (i) to receive an RF communications signal from a plurality of local fixed-location service-area antenna stations, and (ii) to measure reception signal strength respectively associated with the received signal from at least two of the plurality of antenna stations; (B) a recording module -610- for Recording the selected location by electronically storing at least two of the respective reception signal strength measurements; (C) a monitoring module -620- for Monitoring by second-causing a portable RF communications device (i) to receive communications signals from a plurality of respectively local fixed-location service-area antenna stations, and (ii) to measure reception signal strength associated with the signals; and (D) a determination module -630- for Determining if the portable RF communications device of the Monitoring step is at the selected location of the registering step by electronically comparing measurements in the monitoring step with the stored at least two measurements of the Recording step.

For the sake of good order, it is noted that the reader is now directed to recall: the aforementioned illustrative enabling embodiment (see FIG. 7) of Signal-Comparison Based Location-Determining Method--according to a simplified aspect--substantially relate to a method for determining a cell phone (or a ubiquitous computer) location comprising: (A) at a desired location--Causing -700- a cell phone (or a ubiquitous computer) to measure signal strengths from surrounding cells and to record the signal strengths measured by the cell phone (or the ubiquitous computer) from the surrounding

cells; (B) at a current location--Causing -710- a cell phone (or a ubiquitous computer) to measure the signal strengths from surrounding cells; and (C) Causing -720- the Cell phone (or ubiquitous computer) to compare the measured signal strengths from surrounding cells at the current location with the recorded signal strengths from surrounding cells at the desired location (in order to determine whether the cell phone or the ubiquitous computer of the present location is also at the desired location).

According to a first variation of the illustrative enabling embodiment, measuring signal strength includes identifying a unique ID in a portion of the signal.

According to a second variation of the illustrative enabling embodiment, the current location cell phone measuring the signal strengths from surrounding cells is done at regular time intervals or at scheduled times or a predetermined following an event or following a request.

According to a third variation of the illustrative enabling embodiment, the comparing step (C) includes comparing measured signal strengths on a cell by cell basis (for example, according to the unique ID of the first variation or according to other signal characteristics that facilitate differentiation). Preferably, two signal strengths measured by the cell phone from the same cell at the current location and the desired location are considered to be similar if their respective difference is within a predetermined threshold. Alternatively, signal strengths measured at a single location are compared to one-another so that spurious changes of RF absorbing or RF reflecting materials in the surrounding

geographical region can be accounted for and intelligently ignored--as for example will be the case if an area of dirt roads re-paved with asphalt or one of asphalt re-paved over with brick-work, etc. Now, according to a further improvement, the compared signal strengths measured by the cell phone at the current location and at the desired location are considered similar when at-least a pre-determined number of these measurements (and preferably but not necessarily with their respective IDs) are matched--thereby resulting in a determinative judgment that the cell phone has returned to the desired location. It should be noted that there is a very low probability that a cell phone (measuring a few different signal strengths at the desired location) will at some future moment be in a different location having that same combination of signal strengths. Thus, the method of the instant invention may be accomplished without resorting to ID identification or comparison--however, presumably a larger number of no-ID signals would be probabilistically necessary to be measured and conclusively matched from the desired and current locations. According to a more preferred form of this variation embodiment, the at-least pre-determined number of "these measurements" of cells are those cells with have the strongest measured signals. By way of a supplementary metric, the sum of the differences between measured signal strengths from the same cells at the current location and at the desired location, being less than a pre-determined threshold, will result in a determination that the cell phone has returned to the desired location.

According to a fourth variation of the illustrative enabling embodiment, measuring signal strength includes measuring an equivalent signal aspect characteristic such as the cell phone measuring arrival times or phases of signals arriving from surrounding cells or the

likes.

According to a fifth variation of the illustrative enabling embodiment, the comparing step (C) includes the calculating of relations between signals of cells; especially but not necessarily wherein the cells are neighboring cells. Preferably, this is wherein cells are considered neighboring cells if their signals are the strongest signals measured by the cell phone. Substantially this means the most proximate base stations antennas are substantially respectively neighbors to one-another.

Thus, the combination of measured signal strengths from surrounding cells (including possibly more distant than just "surrounding" cells' service area antennas) as measured by the cell phone at a certain location creates a unique fingerprint identifying the location.

This unique fingerprint, which unlike GPS signals is always available to the cell phone, can be used to determine that a cell phone has returned to a location it has already been to.

Now we will turn our attention to discuss other useful aspects of the embodiments of the instant invention. Since the instant invention is used to determine that a cell phone current location is the same as a location that the cell phone has already been to in the past, there is no need to translate the combination of measured signal strengths at surrounding cells to geographical coordinates. Simply stated, for the simply purposes of the cell phone, substantially matching a current antenna space reception fingerprint (or a

significant portion thereof) with a predetermined antenna space reception fingerprint (or a significant portion thereof) constitutes a return to an indeterminate coordinate space "brigin"--and this "Substantial matching" is sufficient to accomplish the most basic objectives of the instant invention.

The combination of signal strengths measured by the cell phone from surrounding cells at a specific location provides an accurate definition of the location with many advantages over existing location determination methods: [0092]1) No need to calculate geographical coordinates, which significantly reduces the amount of required calculation. [0093]2) Signal strengths can always be measured by a cell phone without the assistance of a cellular network. [0094]3) The simple calculation required to compare the signal strengths measured by a cell phone from surrounding cells at a current location and a desired location makes this method ideal for any cell phone in general and cheap cell phones that do not have a GPS and do not have the capability for significant calculation specifically.

The apparent disadvantage of the instant invention method is that it requires the cell phone to record the signal strengths at a desired location. Thus according to simplest embodiments of the instant invention, the user can not ask for a location based service by simply entering an address or a geographical coordinates. Having said that, many location based services are initiated when a user is at the location where he would like to receive the service, and therefore the suggested method's disadvantage does not limit the user for these services.

Moreover, the simple embodiment instant invention method can be used in conjunction with other location-determining methods. If geographical coordinates are initially used for the definition of a location based service, as soon as the cell phone is determined to be present at those geographical coordinates regardless of whether the cell phone determined its geographic location (using a GPS or another method) or the cellular network determines the geographic location of the cell phone or a combination, the cell phone can record the signal strengths at that geographical location and going forward instead of determining the cell phone has returned to that location by checking the geographical coordinates use the suggested invention as it requires less resources and is faster.

Accuracy-wise, the more cells a cell phone can measure the signal it receives from them, the more accurate the instant method is. Nevertheless, as described in the probabilistic considerations of the "small house" example (above), a large plurality of reception from different base station antennas is not necessarily required to provide "adequate" location identity confirmation (returning to a predetermined measured location). When it is described according embodiments of the instant invention that a cell phone measures a signal-strength from a surrounding cell, it means that the cell phone measures the strength of the signal sent by that cell's base station antenna. These measurements are from the perspective of the location of the reception device (the cellular telephone, ubiquitous computer, etc.) and substantially form a instance of an antenna space reception fingerprint; even though a significant portion thereof is sufficient for many applications.

Clearly, as a cell phone user moves around he gets closer to some cells and get further away from other cells, which is reflected in the combination of signal strengths measured by the cell phone from the surrounding cells (generally speaking, the closer a cell phone is to a cell's base station the stronger the signal it will measure from the cell's base station). Exceptions, to the basic physics approximation of signal strength as proportional to a square of the distance separating the cell phone from the base station antenna, are created by the reflectivity and absorbance characteristics of materials in and along the signal path(s) there-between.

Unlike other location-determining methods, as it is the cell phone that measures the signal strengths, obstacles that impact the accuracy and availability of other location-determining methods do not impact the suggested method. Such obstacles include the non-availability of GPS signals within buildings or accuracy problems originating from the propagation of signals to cell towers and their measurement by systems located at the cell towers.

Here follows another non-limiting implementation--

The user reaches a location where he would like a certain location based service to take place every time he reaches that location.

Such a service could be having calls to his cell phone ring simultaneously both on his cell phone and the landline at the desired location every time he is determined to be at the

desired location (the user's home for example) by the software responsible of determining its location which is running on the cell phone (a geo-location based group calling service).

An example of another service will be to receive discount coupons from mall stores every time the user enters the shopping mall next to his home (the shopping mall is a desired location).

The user will stand in the location where he would like something to take place every time he reaches that place (a desired location). Using his cell phone he will choose the action that he wants to take place. The action he would like to take place will then be associated with the location where the user is standing where the location will be defined by software running on the cell phone as the combination of signal strengths measured by the cell phone from surrounding cells.

It should be noted that the surrounding cells would each be uniquely identified by the cell phone.

A cell might be identified by a cell phone by the same unique ID used by a cellular network to identify the cell (assuming the cell phone has access to the full ID) or possibly by a combination of the cell ID as recognized by the cell phone along with an LAC (Location Area Code). Obviously the cell phone may use other variables it receives from surrounding cells base stations to uniquely identify a cell by either using one variable or a

combination of variables.

The cell phone may further use the cellular network it self as one of the variables identifying a cell in order to avoid a case where two different cellular networks the cell phone is roaming between use the same IDs (as recorded by the cell phone) to identify their cells.

It should further be noted that even if cell IDs used by a cell phone will not be unique per cell (i.e. two or more cells in a cellular network will have the same ID as recorded by the cell phone), the odds of the cell phone recognizing two different locations as the same location are very low since it will require the same cell IDs to be used in two different areas and the same signal strengths to be recorded from the `same` cells in two different locations.

Once the cell phone records the signal strengths measured by the cell phone from surrounding cells at a desired location, the combination of the recorded signal strengths from surrounding cells are used as the coordinates of the desired location.

It should be noted that there is no limit on the number of desired locations that could be recorded and tracked by the cell phone.

After the cell phone records the desired location coordinates (the combination of signal strengths from surrounding cells), the cell phone will check its location as reflected by

the signal strengths from surrounding cells at specific time intervals (every 2 minutes for example) or at specific times (every 5 minutes during the day and every 15 minutes between 3 am and 6 am) or depending on the rate the user's location changes (if the user does not change its location for more than 60 minutes then the rate of checking the location can be reduced from every 5 minutes to every 20 minutes to save battery power) or at the occurrence of an event (such as the cell phone switching the base station it is registered with) or upon a request from the network to do so or upon a request from an application to do so or upon a request from the user to do so etc.

If the current location's surrounding cell IDs are different from the desired location's surrounding cell IDs then the cell phone does not need to continue the comparison, the current location is clearly not the desired location.

When the signal strengths from the cells surrounding the current location are identical to the signal strengths measured by the cell phone from the exact same cells (same cell IDs) at the desired location then the cell phone is determined to have returned to the desired location (i.e. current location=desired location) and the location based application which is pending the return of the cell phone to the desired location will be activated.

Having said that, when comparing the current location with the desired location, depending on the location based application, a threshold could be defined based on how close the current location should be to the desired location in order to activate the desired application.

The threshold could be a number that if the difference between two signal strengths measured by the cell phone from the same cell at the current location and the desired location is less than that number the measured signal strengths from the specific cell at the current location and the desired location would be considered similar.

If the difference between the measured signal strength at the current location and the measured signal strength from the same cell at the desired location for each of the surrounding cells is less than the threshold then the cell phone's current position will be considered the same as the desired location or within reasonable range and the location based application which is pending the return of the cell phone to the desired location or to its area will be activated.

In another implementation, it could further be defined that it is enough that the difference between the measured signal strength at the current location and the measured signal strength from the same cell at the desired location for at-least a pre-determined number of surrounding cells (3 cells for example) will be less than the threshold for the current location to be considered within reasonable range from the desired location and as a result to activate the location based application which its activation is pending the return of the cell phone to the area of the desired location.

In another implementation, it could further be defined that the at-least pre-determined number of cells described in the previous paragraph are those cells with the strongest

measured signals.

It should be mentioned that while the more the signal strengths from more surrounding cells are taken into account, the more accurate the location determination is, a possible implementation might take into account as little as one signal strength (the strongest one) in order to determine whether the cell phone has returned to the area of the desired location.

In a different implementation, if the sum of the differences between measured signal strengths from the same cells at the current location and desired location is less than a pre-determined threshold then it will result in determining that the cell phone has returned to the desired location or the desired location area.

It is worthwhile to analyze the suggested method in a typical GSM implementation and a typical CDMA implementation.

In a typical GSM system, GMSK modulation is used on the BCCH (Broadcast Control Channel) carrier. The BCCH carrier is continuously transmitted and without variation of RF level. Cell phones measure the received signal level from surrounding cells by tuning and listening to their BCCH carriers. The measured signal strengths (levels) are used for handover purposes.

The suggested location-determining method is therefore ideal for GSM where

surrounding cells BCCH carriers transmit at the same RF level at all times.

In a typical CDMA system such as a DS-CDMA (Direct Sequence CDMA), since all signals in a DS-CDMA system are sharing the same bandwidth and overlapping in time, the power levels of the signals transmitted by the cell phones (uplink) as well as the power level of the signals transmitted by the base station (downlink) are controlled to achieve acceptable signal-to-interference ratio (SIR) for all users (sometime it's also called C/I--Carrier to Interference ratio). Controlling the SIR helps maximize the system capacity by minimizing the probability for a call to be dropped due to a too low SIR.

While different algorithms for calculating downlink power allocation (i.e. the signal levels/strengths transmitted by a CDMA base station) exist, typically what's common to those different algorithms is the striving to achieve a minimal reasonable SIR for all cell phones connected to the base station where the noise component of the SIR at each of the cell phones is assumed to mainly be impacted by the signals transmitted by surrounding cells. Additionally, the sum of all signals transmitted by a base station to cell phones registered with the base station can not exceed the maximum power the base station transmitter is capable of.

The lower the signals transmitted by surrounding cells' base stations the better the reception at a cell's cell phones. Downlink power control aims to reduce the amount of interference in neighboring cells by adjusting the power of each cell's base station transmitter.

Substantially, this outlines an iterative process where the signal strengths transmitted by base stations of neighboring cells are correlated.

The question then, how would the location determination method described here handle measured signal strengths of surrounding cells that vary as a function of cell phone traffic in a CDMA system?

One way could be to have the cell phone record signal strengths at a desired location at different times of day at different days of the week since cell phone traffic at cells is known to have a repetitive pattern. For example, on Monday between 12 pm and 2 pm people will use their cell phone to make and receive calls at a specific cell in approximately the same way as they will use their cell phones on the following Mondays between 12 pm and 2 pm, which means that the downlink transmitted power by this cell and the neighboring cells will be approximately the same on Monday between 12 pm and 2 pm as well as on the following Mondays between 12 pm and 2 pm since the downlink power is a function of cell phone traffic and the downlink transmitted power of neighboring cells is correlated.

Having said that, ideally a user will identify a desired location to the cell phone only once at one point in time and will not need to repeat the identification of the desired location in different times.

Taking into account the correlation of downlink transmitted signals of neighboring cells, by calculating the relations between the measured signal strengths of neighboring cells, a cell phone can identify that it returned to a desired location by comparing the calculated relations between neighboring cells at current location with the calculated relations between neighboring cells at the desired location. Since the correlation between downlink transmitted signals by cells' base stations is among neighboring cells and a cell phone will not know which of the measured signals belong to neighboring cells and which to non-neighboring cells, in one suggested implementation the cell phone can assume that the cells transmitting the strongest signals are the cells closest to the cell phone and therefore neighboring cells. The cell phone will therefore take into account only the signal strengths of the cells transmitting the strongest signals as those cells will be assumed neighboring cells by the cell phone, therefore their signals correlated and therefore the relations between those cells' signals will represent the cell phone's location. The number of cells assumed neighboring cells could vary depending on factors such as total number of signal strengths measured by the cell phone that could indicate whether the cell phone is in an urban area or in a rural area or a measured signal strength exceeding a threshold calculated by dividing a measured signal strength by the strongest measured signal at the current location etc.

An example of the above suggested implementation will be--a location is identified to the cell phone as a desired location by the cell phone owner.

The cell phone measures the signal strengths of surrounding cells. The cell phone

measures 10 signals from 10 surrounding cells. The cell phone chooses the 4 cells with the strongest signals as neighboring cells (cells #1, 4, 6, 9). The cell phone calculates the ratio between the chosen 4 signals by dividing the 3 less strong signals by the strongest signal (assuming that cell #4 has the strongest signal). The cell phone records the 3 relations (cell #1 signal/cell #4 signal, cell #6 signal/cell #4 signal and cell #9 signal/cell #4 signal). The cell phone may further record the measured signal strengths of the 4 chosen cells. From that point in time onward, the cell phone checks to see if signals from unique cells #1, 4, 6 and 9 can be measured by the cell phone. If the cell phone can measure signals from cells #1, 4, 6 and 9, the cell phone calculates the relations between cells #1, 6 and 9 to cell #4. If the calculated relations at the current location are identical to the recorded relations the cell phone determines that it has returned to the desired location. The cell phone can determine that it has returned to the desired location or to an area close enough to be considered the desired location by subtracting each of the relations at the current location from each of the corresponding relations at the desired location and demanding that the each of the subtraction for each of the relations does not exceed a certain threshold or that the sum of the subtractions does not exceed a certain threshold or alternatively any other formula.

The above example assumes that one cell (cell #4 in the above example) will always have the strongest signal at the desired location (while the signal of cell #4 will vary as a function of number of subscribers at neighboring cells the assumption is it will always be relatively the strongest). This assumption will not be true in the case the cell phone is located at equal distances to the base stations of 2 cells' base stations--cell #4 and cell #1.

The cell phone might be registered with cell #4 at 2 pm on Monday when the number of subscribers at cell #1 is very high and the number of subscribers at cell #4 is low but at 7 pm the same day when the number of subscribers at cell #1 will be low and the number of subscribers at cell #4 will be very high the cell phone will be registered with cell #1 at the same physical location. Accordingly, if the cell phone would have measured the signal strengths at 2 pm and 7 pm cell #4 signal would have come stronger only at 2 pm while at 7 pm the signal of cell #1 would have come stronger. We therefore need to accommodate this case in the location determination algorithm when used in a CDMA system or other systems with the same characteristics. When a cell phone is on the border of 2 cells, the signals as measured by the cell phone will be close to each other. In one possible implementation the algorithm can allow a higher threshold (which will make relations not as close when subtracted still less than the threshold that was made higher). In another possible implementation the cell phone can divide the signal strength of the chosen cells not by the signal of the strongest cell but by the sum of the signals of the 2 strongest cells if the two strongest cells are close enough in strength. For example, if at 2 pm the signal strength of cell #4 is only slightly stronger than the signal strength of cell #1, the cell phone will calculate the following relations: [0135]cell #6 signal/(cell #4 signal+cell #1 signal) [0136]cell #9 signal/(cell #4 signal+cell #1 signal)

Obviously, the above are just suggested implementations and other possible implementations using other formulas are possible.

It was mentioned that more measurements taken at the desired location at different points

in time could help improve the location determination. It was further mentioned that the user will ideally identify a location as a desired location to a cell phone only once. Since in many cases a desired location is a user's home or office and after the identification of a location as a desired location the user stays in that location for several hours, a cell phone can continue and measure signal strengths at a desired location hours after the location was identified to the cell phone as a desired location.

The cell phone will be able to determine that it is still at the desired location by measuring the rate the measured signal strengths change and the relations among them. When a user walks or drives the rate a signal strength of a specific cell changes will be faster than if the user stayed in one place. The relations between the signal strengths of surrounding cells will also change when the user walks or drives away from the desired location. The above therefore enable a cell phone to gather more measurements at the desired location at different points in time without requiring the user to identify a place as a desired location more than once.

The suggested method will also be able to recognize changes in the cellular network such as the addition of a new cell or the cancellation of a cell or a retune of the network since the changes will mainly be reflected in one or two measured cells' signal strengths or the relations of one or two measured signal strengths to the strongest measured signal etc.

It should be noted that depending on the desired accuracy, the range from the desired location that within the location pending service will still be activated and so forth,

different formulas and methods other than the described above might be devised to do the comparison between the measured signal strengths as measured by the cell phone from surrounding cells at the current location and desired location.

While the preferred embodiment refers to signal strengths that any cell phone can measure today, cellular networks might decide to use the described invention by using other parameters that they will make available to cell phones.

Such parameters could be for example as follows--a cellular network will broadcast from all base stations a signal which will be synchronized among the base stations (the base stations could be synchronized using GPS signals). A cell phone will measure the time the same signal will arrive from surrounding cells at a current location. The different arrival times of the same signal will reflect the distance of the cell phone to the surrounding cells. Those arrival times could be recorded by the cell phone as the coordinates of a desired location.

The same way, the cell phone recorded, measured and compared signal strengths from surrounding cells, the cell phone will record, measure and compare the arrival times from surrounding cells of the synchronized signal.

Alternatively, a cellular network may decide to send the same synchronized signal from all base stations and the cell phone will measure the phase the signals will arrive to the cell phone with from the surrounding cells and the combination of signal phases will be

used as coordinates of locations.

The same way, the cell phone recorded, measured and compared signal strengths from surrounding cells, the cell phone will record, measure and compare the phases of arriving signals from surrounding cells of the synchronized signal.

It should be noted that these are just examples, the cellular networks may decide to make another parameter or combination of parameters available to cell phones and the cell phones could use the combination of measured parameters from surrounding cells as coordinates of a location.

While the above embodiments describe the usage of the invention for cell phones, the invention can clearly be used in other embodiments where a wireless phone can choose between several networks to connect to, which means that the wireless phone can measure the signal strengths of several surrounding networks (or other parameters made available by the networks to the wireless phone).

An example of the above will be WiFi hot spots where a wireless phone can choose between connecting to any of several surrounding WiFi hot spots. The wireless phone could measure the signal strengths of the surrounding WiFi networks and use the recorded signal strengths as a unique fingerprint of its location.

Another example will be a phone that combines WiFi and cellular by routing a call over a

WiFi network or a cellular network. Such a phone can measure not only the signal strengths of the surrounding cells but also the signal strengths of surrounding WiFi networks where the combined measurements of surrounding WiFi networks and cells will possibly provide a more accurate location representation. Obviously, the formula used by the phone to combine the measurements of the WiFi networks signal strengths and the cells signal strengths could vary based on the desired accuracy, used cellular communication protocols (GSM or CDMA or other) etc, A further example, WiMax networks where a wireless phone can choose between connecting to any of several surrounding WiMax networks. The wireless phone could measure the signal strengths of the surrounding WiMax networks and use the recorded signal strengths as a unique fingerprint of its location.

The invention could also be implemented in a phone combining measurements of signal strengths (or other parameters made available by networks) from several different networks including cellular networks, WiFi networks and WiMax networks.

While the invention has been described with respect to specific examples including presently preferred modes of carrying out the invention, those skilled in the art will appreciate that there are numerous variations and permutations of the Signal-Comparison Based Location-Determining Method, described systems, and techniques that fall within the spirit and scope of the invention as set forth in the appended claims. By non-limiting example, we mention that for purposes of establishing a location fingerprint (coordinate reference) today's cellular telephone in juxtaposition to established local area base station

service antennas is substantially equivalent to a RF communications enabled ubiquitous computer in communications with fixed respective base stations antennas; or the likes. Hence, the references to a cellular telephone in the preferred embodiment may be easily extended to any device capable of receiving and measuring a plurality of EMF signals-- and therewith to comply with the other aspects to the instant invention.

While privacy wise, it is preferable to measure signals, record, them, and compare them-- all respectively on a portable device per se, there are many cultures that are less concerned with personal privacy issues. In such circumstances, any or all of the steps may be performed from the perspective of service area antenna(s) coordinated by server communications there between. The real distinction is that the instant invention embodiments determine that one is at a specific location from a comparison of signal strengths or like characteristics made at the same location.

In addition, the instant invention relates to embodiments (and Mutatis Mutandis to all of the aforementioned instant invention embodiment variations thereof) of A Signal-Comparison Based Location-Determining Method, operable by at least one portable RF communications device in conjunction with at least two fixed-location service-area antenna stations respectively capable of RF communication with the at least one device wherein the stations are substantially continuously operating, and the method is comprising the steps of:

(A) First-Causing a portable RF communications device at a selected location to receive

an RF communications signal from a plurality of local fixed-location GSM service-area antenna stations;

(B) First-Measuring reception signal strength respectively associated with the "First - Causing" received signal from at least two of the plurality of antenna stations;

(C) Second-Causing a portable RF communications device to receive an RF communications signal from a plurality of local fixed-location GSM service-area antenna stations;

(D) Second-Measuring reception signal strength respectively associated with the "Second -Causing" received signals; and

(E) Determining, if the portable RF communications device of the "Second-Causing" step is at the selected location of the "First-Causing" step, By electronically Comparing at least two of the respective reception signal measurements of the "First-Measuring" step with at least two of the respective reception signal measurements of the "Second-Measuring" step.

Furthermore, the instant invention also relates to embodiments (and Mutatis Mutandis to all of the aforementioned instant invention embodiment variations thereof) of A Signal-Comparison Based Location-Determining Method, operable by at least one portable RF communications device in conjunction with at least two fixed-location service-area

antenna stations respectively capable of RF communication with the at least one device wherein the stations are substantially continuously operating, and the method is comprising the steps of:

(A) First-Causing a portable RF communications device at a selected location to receive an RF communications signal from a plurality of local fixed-location CDMA service-area antenna stations;

(B) First-Measuring reception signal strength respectively associated with the "First-Causing" received signal from at least two of the plurality of antenna stations and therewith calculating respectively relative signal reception strengths;

(C) Second-Causing a portable RF communications device to receive an RF communications signal from a plurality of local fixed-location CDMA service-area antenna stations;

(D) Second-Measuring reception signal strength respectively associated with the "Second-Causing" received signals and therewith calculating respectively relative signal reception strengths; and

(E) Determining, if the portable RF communications device of the "Second-Causing" step is at the selected location of the "First-Causing" step, By electronically Comparing at least one of the calculated respective relative reception signal strengths of the "First-

Measuring" step with at least one of the calculated respective relative reception signal strengths of the "Second-Measuring" step.

Likewise, Mutatis Mutandis to all of the aforementioned instant invention embodiments and variations thereof, determinations that are based on derivatives, integrals, statistical metrics, mathematical normalizations, correlation functions, heuristic convolution functions, or the likes--are substantially consistent with the "pith and marrow" of the instant invention--because the embodiments of the instant invention are designated for the purpose of knowing a geographical location by comparing a previously known antenna space measurement (at location "1") with a current antenna space measurement (performed at location "2"), and deciding if the location of the current measurement ("2") is to be considered as being within a nominal distance from the known measurement (at "1"). Simply stated, the instant invention is verifying that a portable RF reception device is at a geographical location--if it reasonably corresponds to a known antenna space measurement for that location.

In describing the present invention, explanations are presented in light of currently accepted telecommunications theories and communications enabled ubiquitous computing models. Such theories and models are subject to changes, both adiabatic and radical. Often these changes occur because representations for fundamental component elements are innovated, because new transformations between these elements are conceived, or because new interpretations arise for these elements or for their transformations. Therefore, it is important to note that the present invention relates to

specific technological actualization in embodiments. Accordingly, theory or model dependent explanations herein, related to these embodiments, are presented for the purpose of teaching, the current man of the art how these embodiments may be substantially realized in practice. Alternative or equivalent explanations for these embodiments may neither deny nor alter their realization.

Furthermore, numbers, alphabetic characters, and roman symbols as designated herein are for convenience of explanations only, and should by no means be regarded as imposing particular order on any method steps.

INDUSTRIAL APPLICABILITY

Technical Issues: For mobile telephone devices, an ability to measure signal strength of signals received from local service area antennas and an ability to extract respective ID data from such signals is a self-evident feature. Furthermore, the mobile telephone device generally has a reasonable amount of spare computing power onboard. Thus, for the mobile telephone device and for many other RF enabled communication reception with computing capability devices, the method of the present invention is straightforward to configure using existing off-the-shelf technological components.

Ergonomic Issues: The present method allows for user privacy by choice; a feature that is not available at a comparable cost--since a cell phone with a GPS costs more than a cell phone without a GPS.

Economic Issues: The present method can be implemented on any cheap cell phone which does not include a GPS, thereby bringing location based services to the masses by reducing the price of the location determining method used by the phone. Furthermore, the present method facilitates emergency location reporting in many places where GPS fails; a feature that can not be expressed in finite monetary terms.

Claims

What is claimed is:

1. A signal-comparison based location-determining method, operable by a first portable RF communications device in conjunction with at least two fixed location service-area antenna stations capable of RF communication with the device wherein the stations are substantially continuously operating, the method comprising the steps of:
 - (a) the first portable RF communications device monitoring its location by (i) receiving communications signals from a plurality of local fixed-location service-area antenna stations, (ii) identifying at least one ID within at least one of the received communications signals, and (iii) measuring a signal characteristic associated with the communications signals;
 - (b) the first portable RF communication device determining if the monitored location is within proximity to a location chosen by a user of the first portable RF communication device, by electronically comparing a fingerprint of the monitored location with a fingerprint of the chosen location, wherein the fingerprint of a given location is a group of figures identifying the location which include at least one figure which is an ID within a communication signal received at the given location and at least one figure which is based on a characteristic of a signal received at the location.

2. The method of claim 1 wherein the characteristic of a signal at the location is the signal's strength, and the location fingerprint is based on at least one signal strength at the location.
3. The method of claim 2 wherein the chosen location fingerprint is based on signal strengths measured by the first portable RF communication device.
4. The method of claim 2 wherein the chosen location fingerprint is based on signal strengths measured by a second portable RF communication device, different from the first portable RF communication device.
5. The method of claim 2 wherein the chosen location fingerprint is based on signal strengths originating from a database of geographic locations and corresponding fingerprints.
6. The method of claim 5 wherein the database is stored remotely, and not on the first portable RF communication device.
7. The method of claim 5 wherein the database is built by a service provider.
8. The method of claim 5 wherein the database is built based on multiple locations, where for each location, GPS measurements and signal strength measurements are performed and the IDs of nearby cells are recognized.

9. The method of claim 8 wherein at least for some of the locations, signal strength measurements are taken at different times.
10. The method of claim 8 wherein the signal strength measurements are taken using a portable RF communication device.
11. The method of claim 10 wherein the signal strength measurements or calculation results made using the signal strength measurements, along with the cell IDs, are sent by the portable RF communication device to a server responsible for building the database of geographic locations and corresponding fingerprints.
12. The method of claim 5 wherein the chosen location fingerprint is taken from the database of geographic locations and corresponding fingerprints using a geographic location entered by the first portable RF communication device user as his chosen location.
13. The method of claim 5 wherein the chosen location fingerprint, which corresponds with a geographical location chosen by the first portable RF communication device user, is the result of extrapolating the fingerprints of locations in the database of geographic locations and corresponding fingerprints.

14. The method of claim 5 wherein the chosen location fingerprint, which corresponds with a geographical location chosen by the first portable RF communication device user, is taken from the database of geographic locations and corresponding fingerprints, said database being built using computational closure.
15. The method of claim 1 wherein the at least one ID is a cell ID.
16. The method of claim 1 wherein the first portable RF communication device is a mobile phone.
17. The method of claim 1 wherein the first portable RF communication device is a ubiquitous computer.
18. The method of claim 1 wherein the characteristic of a signal at the location is the signal's strength, and the location's fingerprint comprises at least one signal strength at the location of signals broadcasted by nearby cell towers and the ID of at least one of the cell towers.
19. The method of claim 1 wherein a location's fingerprint comprises at least one relation between signal characteristics at the location of signals broadcasted by nearby cell towers and the ID of at least one of the cell towers.

20. The method of claim 19 wherein the characteristic of a signal at the location is the signal's strength.
21. The method of claim 1 wherein the characteristic of a signal at the location is the signal's strength, and the location's fingerprint is the result of a calculation using signal strengths.
22. The method of claim 1 wherein the characteristic of a signal at the location is the signal's arrival time, and the location's fingerprint comprises at least one arrival time at the location of a signal broadcasted by nearby cell towers and the ID of at least one of the cell towers.
23. The method of claim 1 wherein the characteristic of a signal at the location is the signal's phase, and the location's fingerprint comprises at least one phase at the location of signals broadcasted by nearby cell towers and the ID of at least one of the cell towers.
24. The method of claim 1 wherein the monitoring step comprises 'low accuracy monitoring' and 'high accuracy monitoring'.
25. The method of claim 24 wherein 'low accuracy monitoring' includes comparing the cell IDs of the chosen location with the cell IDs of the current location.

26. The method of claim 25 wherein 'high accuracy monitoring' takes place only if cell IDs of the current location are determined to match cell IDs of the chosen location in the 'low accuracy monitoring' step.
27. The method of claim 26 wherein 'high accuracy monitoring' includes measuring a signal characteristic at the current location.
28. The method of claim 1 wherein the monitoring step is performed iteratively, with a predetermined time delay between successive iterations such that data from the monitoring step is used only if a substantial portion of the successive measurements are alike within a predetermined threshold.
29. The method of claim 2 wherein the monitored location of the first portable RF communication device is determined to be within proximity of the chosen location if the difference between measured signal strengths at the monitored location and signal strengths at the chosen location is less than a predetermined threshold.
30. A method of facilitating signal-comparison based location-determining by a portable RF communication device, comprising the steps of:
- (a) building a database of geographic locations and corresponding fingerprints, wherein the fingerprint of a given location is a group of figures identifying the location which include at least one figure which is an ID within a communication

signal received at the given location and at least one figure which is based on a characteristic of a signal received at the location;

(b) in response to a geographic location chosen by a portable RF communication device, providing the portable RF communication device with the corresponding fingerprint for the geographic location, which is used by the portable RF communication device in determining whether a location monitored by the portable RF communication device is within proximity to the chosen geographic location by comparing the fingerprint of the monitored location with the fingerprint of the chosen location;

wherein the monitoring of the location includes (i) receiving communications signals from a plurality of local fixed-location service-area antenna stations, (ii) identifying at least one ID within at least one of the received communications signals, and (iii) measuring a signal characteristic associated with the communications signals;

31. The method of claim 30 wherein the characteristic of a signal at the location is the signal's strength, and the location's fingerprint comprises at least one signal strength at the location of signals broadcasted by nearby cell towers and an ID of at least one of the cell towers.

32. The method of claim 31 wherein the database is built based on multiple locations, where for each location, GPS measurements and signal strength measurements are performed and the IDs of nearby cells are recognized.
33. The method of claim 32 wherein at least for some of the locations, signal strength measurements are taken at different times.
34. The method of claim 32 wherein the signal strength measurements are taken using a portable RF communication device.
35. The method of claim 34 wherein the signal strength measurements or calculation results made using the signal strength measurements, along with the cell IDs, are sent by the portable RF communication device to a server responsible for building the database of geographic locations and corresponding fingerprints.
36. The method of claim 30 wherein the chosen location fingerprint is taken from the database of geographic locations and corresponding fingerprints using a geographic location entered by the portable RF communication device user as his chosen location.
37. The method of claim 31 wherein the chosen location fingerprint, which corresponds with a geographical location chosen by the portable RF communication device user,

is the result of extrapolating the fingerprints of locations in the database of geographic locations and corresponding fingerprints.

38. The method of claim 31 wherein the chosen location fingerprint, which corresponds with a geographical location chosen by the portable RF communication device user, is taken from the database of geographic locations and corresponding fingerprints, said database being built using computational closure.
39. The method of claim 30 wherein the at least one ID is a cell ID.
40. The method of claim 30 wherein a location's fingerprint comprises at least one relation between signal characteristics at the location of signals broadcasted by nearby cell towers and the ID of at least one of the cell towers.
41. The method of claim 40 wherein the characteristic of a signal at the location is the signal strength.
42. The method of claim 30 wherein the characteristic of a signal at the location is the signal's strength, and the location's fingerprint is the result of a calculation using signal strengths.
43. The method of claim 30 wherein the characteristic of a signal at the location is the signal's arrival time, and the location's fingerprint comprises at least one arrival time

at the location of a signal broadcasted by nearby cell towers and the ID of at least one of the cell towers.

44. The method of claim 30 wherein the characteristic of a signal at the location is the signal's phase, and the location's fingerprint comprises at least one phase at the location of signals broadcasted by nearby cell towers and the ID of at least one of the cell towers.

45. A signal-comparison based location-determining system, comprising:

(a) a first portable RF communications device communicating with at least two fixed location service-area antenna stations capable of RF communication with the device, wherein the antenna stations are substantially continuously operating;

(b) software residing on the portable RF communications device, said software causing the portable RF communications device to monitor its location by (i) receiving communications signals from a plurality of local fixed-location service-area antenna stations, (ii) identifying at least one ID within at least one of the received communications signals, and (iii) measuring a signal characteristic associated with the communications signals;

(c) software residing on the portable RF communication device, said software causing the portable RF communication device to determine if the monitored location is within proximity to a location chosen by a user of the portable RF communication device, by electronically comparing a fingerprint of the monitored location with a fingerprint of the chosen location, wherein the fingerprint of a given location is a group of figures identifying the location which include at least one figure which is an ID within a communication signal received at the given location and at least one figure which is based on a characteristic of a signal received at the location.

46. A system for facilitating signal-comparison based location-determining by a portable RF communication device, comprising:

(a) a computer;

(b) a database residing on the computer and containing geographic locations and corresponding fingerprints, wherein the fingerprint of a given location is a group of figures identifying the location, which include at least one figure which is an ID within a communication signal received at the given location and at least one figure which is based on a characteristic of a signal received at the location;

(c) wherein the computer, in response to a geographic location chosen by a portable RF communication device, provides the portable RF communication

device with the corresponding fingerprint for the geographic location, which is used by the portable RF communication device to determine whether a location monitored by the portable RF communication device is within proximity to the chosen geographic location by comparing the fingerprint of the monitored location with the fingerprint of the chosen location;

wherein the monitoring of the location includes (i) receiving communications signals from a plurality of local fixed-location service-area antenna stations, (ii) identifying at least one ID within at least one of the received communications signals, and (iii) measuring a signal characteristic associated with the communications signals.

Abstract

At least one portable RF communications device in conjunction with at least two fixed-location service-area antenna stations respectively capable of RF communication with the at least one device performs the steps of: (I) using a portable device at a selected location to measure RF communications signals from the plurality of local fixed-location service-area antenna stations and electronically storing at least two of the respective reception signal strength measurements; and (II) monitoring a portable device location by causing the device to measure reception signal strength associated with local fixed-location service-area antenna stations signals, and to electronically compare these measurements with the stored at least two measurements.

Figure 1

$$\boxed{100} \rightarrow \boxed{110}$$

Figure 2

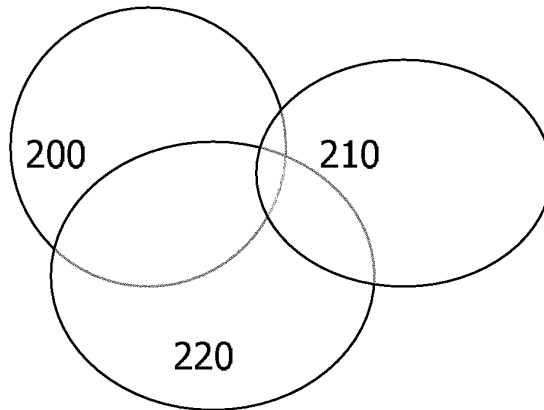


Figure 3

$$\boxed{300} \rightarrow \boxed{310} \rightarrow \boxed{320} \rightarrow \boxed{330}$$

Figure 4

$$\boxed{400}$$

Figure 5

$$\boxed{500} \rightarrow \boxed{510} \rightarrow \boxed{520} \rightarrow \boxed{530}$$

Figure 6

$$\boxed{600} \leftrightarrow \boxed{610} \leftrightarrow \boxed{620} \leftrightarrow \boxed{630}$$

Figure 7

$$\boxed{700} \rightarrow \boxed{710} \rightarrow \boxed{720}$$

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**DECLARATION FOR UTILITY OR
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Declaration
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With Initial
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Submitted after Initial
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(37 CFR 1.16 (e))
required)

Attorney Docket Number

First Named Inventor

SHKEDI, Roy

COMPLETE IF KNOWN

Application Number

Filing Date

Art Unit

Examiner Name

I hereby declare that:

Each inventor's residence, mailing address, and citizenship are as stated below next to their name.

I believe the inventor(s) named below to be the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Signal Comparison-Based Location Determining Method

(Title of the Invention)

the specification of which



is attached hereto

OR



was filed on (MM/DD/YYYY)

as United States Application Number or PCT International

Application Number

I was amended on (MM/DD/YYYY)

(if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

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			☐	☐	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

[Page 1 of 2]

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Roy		SHKEDI	
Inventor's Signature <i>Roy Shkedi</i>			Date 02/25/2010
Residence: City New York	State NY	Country US	Citizenship IL
Mailing Address 69-11 Yellowstone Blvd., Apt. A-35			
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First Named Inventor	SHKEDI, Roy
Title	Signal Comparison-Based
Art Unit	Location Determining Method
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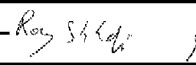
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Signature		Date	02/25/2010
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Title and Company	Applicant/Inventor		

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First Named Inventor	Shkedi, Roy
Art Unit	
Examiner Name	
Attorney Docket Number	

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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		US- 7057556	6/6/06	Hall	
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		EP12419093	09/18/2002	L.M. Ericsson		

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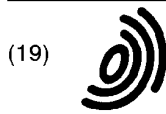
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		Motorola, Inc., Overview of 2G LCS Technologies and Standards (3GPP TSG SA2 LCS Workshop LCS-010019 - London, UK, 11 - 12 January 2001).	
		Y. Zhao, "Mobile Phone Location Determination and Its Impact on Intelligent Transportation Systems," IEEE Transactions on Intelligent Transportation Systems, vol. 1, no. 1, pp. 55-64, Mar. 2000.	
		A Survey and Taxonomy of Location Systems for Ubiquitous Computing - by Jeffrey Hightower and Gaetano Borriello (Technical Report UW-CSE 01-08-03).	
		SpotON: An Indoor 3D Location Sensing Technology Based on RF Signal Strength - by Jeffrey Hightower and Gaetano Borriello - (UW CSE Technical Report #2000-02-02).	

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(11) **EP 1 241 909 A1**

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(72) Inventor: **Wätjen, Rasmus**
2800 Lyngby (DK)

(74) Representative: **Wittrup, Flemming et al**
Hofman-Bang Zacco A/S
Hans Bekkevolds Allé 7
2900 Hellerup (DK)

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(71) Applicant: **TELEFONAKTIEBOLAGET L M**
ERICSSON (publ)
126 25 Stockholm (SE)

(54) **Method and computer readable medium for a program for location determination of a mobile terminal**

(57) A method for deciding on the location of a mobile terminal communicating on occasion with a number of base stations having respective predefined antenna coverage zones (Z1, Z2) said method comprising the steps of registering a unique mobile terminal number and an identification number of the base station occa-

sionally communicating with the mobile terminal, comparing the registered data with previously registered data and if the zone number is new When the old zone number is replaced by the new zone number, and dedicating the zone number to a predetermined area (1) of location.

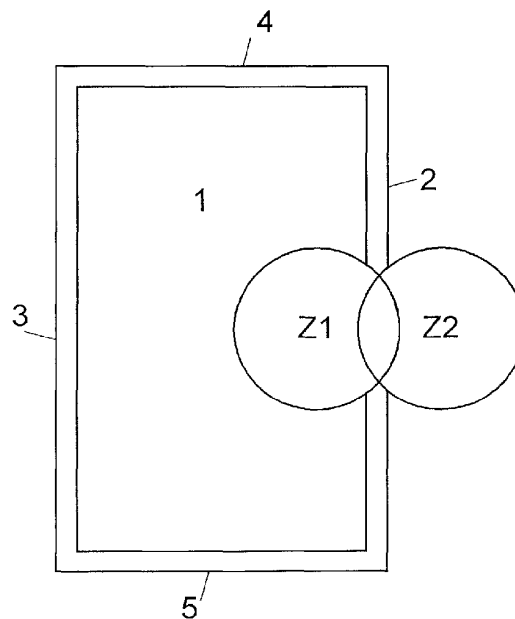


Fig. 2

EP 1 241 909 A1

Description

[0001] The invention relates to a method for location determination of a mobile terminal by means of radio connections which are controlled by a common server.

[0002] Many techniques are being considered to provide automatic location capability. One technique being considered involves measuring the time difference of arrival of signals from a number of cell sites. These signals are triangulated to extract location information. Unfortunately, this technique requires a high concentration of cell sites and/or an increase in the transmission power of the sites to be effective. This is due to the fact that in a typical CDMA system, each telephone transmits with only enough signal power to reach the closest cell site. As triangulation requires communication with at least three sites, the concentration of cell sites would have to be increased or the signal power of each wireless unit would have to be increased.

[0003] In any event, each alternative has significant drawbacks. An increase in the number of cell sites would be too costly. Increases in signal power would add to the weight and cost of each wireless unit and increase the likelihood of interference between wireless users. In addition, the triangulation approach does not appear to offer the accuracy required by the FCC mandate.

[0004] Another approach being considered involves the addition of GPS (Global Positioning System) functionality to the cellular telephone. Although this approach would add significant cost and weight to the wireless unit, require a line-of-sight to four satellites, and would be somewhat slow, nevertheless, it is the most accurate approach to support location services. A drawback of these known systems is also that it is undistinguishable whether a mobile unit is close to the one or the opposite side of a partition wall.

[0005] An example of a technique using propagation delay times is known from WO 99/04517, and WO 99/47943 discloses a technique where two GPS satellites are sufficient. However, GPS-based location determination is not very suitable in buildings or in streets with tall buildings because of satellite drop-out. WO 00/50519 discloses a mobile computer seeking to determine its location in a building by detecting the signal strength of one or more wireless base stations placed at known locations throughout the building. The signal strength may vary much inside a building because of movement of people and things, and it is not possible to determine the position solely on the basis of signal strength measurements. It is necessary to store a great table in a central system where the table empirically links signal strengths and location.

[0006] The object of the invention is to provide a method which allows very precise determination of the location of a mobile unit. Specifically it must be possible to determine with certainty whether the mobile unit is present on one or the other side of a partition wall perhaps just 10 cm thick. And the method must also be ca-

pable of being used in radio-dead spaces which find ever greater application.

[0007] This object is achieved by providing at least one pair of different radio zones closely spaced from each other so that distinct directional information transversely to a boundary between the pair of radio zones is provided upon recording of the movements of the mobile terminal in the zones.

[0008] The position of said pair of radio zones is well-known and is stored in the server, and the location determination is based upon whether the mobile unit has moved in one or the opposite direction transversely to a boundary between the two zones of the pair. According to the invention, additional reliability of the location determination is achieved, because the two different radio zones of the pair are in contact with the mobile unit prior to the location determination. More particularly, the mobile unit is defined to be present at the first side of the boundary of the radio zones if contact has first been established with the mobile unit via the second radio zone and later via the first radio zone. The mobile unit is defined to be at the second side, opposite relative to the first, of the boundary between the pair of radio zones if contact has first been established with the mobile unit via the first radio zone and later via the second radio zone.

[0009] This gives a very reliable location determination, and this is achieved in an inexpensive manner as the communication is preferably based on near field radio contact e.g. in accordance with the industrial standard called Bluetooth.

[0010] The invention is interesting for many fields of applications. First, the invention may be applied to determine whether a person carrying the mobile unit is present inside or outside a conference room. It will be appreciated that it is sufficient to provide radio zones around the entries to the room, there being no need to erect antennas where the building parts physically restrict the freedom of movement of the persons.

[0011] According to the invention it is possible to determine with complete certainty whether a mobile unit is present on one or the other side of a just 10 cm thick partition wall. This will be completely impossible with the known systems.

[0012] Typically, a pair of radio zones will be arranged at their respective sides of an entry, but in case of a corridor that connects two rooms it may be sufficient to arrange the zones of the pair at their respective ends of the corridor. Hereby, it will also be appreciated that traffic supervision may be provided by arranging a pair of different radio zones at strategically selected places in a road system. A further example of the use of the invention might be in connection with container terminals for automatic recording of the movement of the containers, each of said containers being equipped with a mobile unit.

[0013] Each of the individual radio zones may be extended by using a larger number of antennas or by the

use of leaking cables. For example, it is possible in a large room with particularly many people to define some cells in the room and to delimit these cells by means of respective pairs of different radio zones. It is hereby much easier to find a person who would otherwise be impossible to find in a crowd of people.

[0014] It is noted that the mobile unit will be out of contact with the radio zones for a longer or shorter period of time. Only when the unit gets within the near field of the antennas connected to the server will communication take place, and the server will be updated accordingly. This allows it to be defined whether the mobile unit is present on one or the other side of a boundary area between a pair of associated radio zones.

[0015] In one application, there may be a plurality of pairs of radio zones all of which are connected to the common server, whereby the server can determine where the mobile unit is located, it being possible to obtain a position which is based on the knowledge of where the different boundaries between the pairs of radio zones are located in e.g. a building. Errors, if any, in the position determination may be found by storing a table of previous positions in the server, and errors can also be obviated by supplementing the location determination according to the invention with other known location determination methods, such as signal strength measurements.

[0016] In a preferred embodiment, the mobile unit is a mobile telephone which is equipped with a Bluetooth communications channel. This means that the costs of establishing the location determination are solely related to the establishment of antennas and a server in a building or elsewhere. This may also mean that the method of the invention is competitive for traffic supervision where GPS or passive tags are widely used.

[0017] The invention also comprises a computer readable medium for storing a program enabling a computer to decide on the location of a mobile terminal based on near field communication with at least two base stations. The medium can be the internet, a CD-ROM, a chip and the invention also covers a location system comprising such a medium.

[0018] The invention will be explained more fully by the following description of some embodiments with reference to the drawing, in which

figure 1 shows a basic sketch of the mode of operation according to the invention,

figure 2 shows a first use of the invention,

figure 3 shows a flow chart for explaining the mode of operation according to figure 1, while

figures 4-6 show various other uses of the invention.

[0019] Figure 1 shows two zones, zone 1 and zone 2, of antenna coverage. The respective antennas and re-

ceiver parts of the zones are connected to radio communications equipment known per se to make it possible to communicate with a mobile terminal, which may occasionally be present within the zones. Preferably, short-range wireless communication is involved, and in a preferred embodiment a Bluetooth wireless communications standard is used. Other communications forms are also possible according to the invention.

[0020] Before the mode of operation will be explained in detail, a first use will be described first with reference to figure 2.

[0021] Figure 2 shows a room 1, e.g. a conference room which is defined by some walls 2-5. The wall 2 includes a door opening, and antenna zones Z1 and Z2 are arranged around the door opening as described in connection with figure 1. According to the invention, distinct directional information may be obtained in the door opening, i.e. whether a person has entered the room 1 or has left the room 1. With the system according to the invention it is not necessary to have radio communication all the time. Only when the person passes the door opening will it be detected with certainty because of the use of two adjacent zones.

[0022] It is hereby possible to determine where e.g. the participants are present. If a person carrying a mobile telephone leans against either the internal or the external side of the lightweight partition wall 3, the signal conditions will be so uniform on both sides of the wall that the known systems cannot detect whether the person is within or outside the room 1. This drawback is overcome by the invention, which allows it to be determined with certainty whether the person has passed the door in an inward direction or an outward direction.

[0023] As has previously been mentioned, the flow chart in figure 3 shows at the top that in a typical use it is just necessary to communicate rarely to achieve a location determination. The system according to the invention, which appears from the example in figure 1, is mostly in a standby position and checks whether communication is going on between the mobile terminal and one of the base stations which is in communications connection with the antennas in zone Z1 and zone Z2. When transmission occurs e.g. between the mobile terminal and the zone Z2, then the information will be transferred to a central server which performs identification of the mobile terminal together with the Bluetooth address which the base station connected to Z2 has. This is tantamount to storing information in a zone register that the transmission has taken place in the zone Z2. This information is compared to whether the system previously had similar information, i.e. whether the system had previously stored that the person was present within the antenna zone Z2. If this is the case, the system will keep its information, and this will thus also be the case even if the person leaves Z2 outside the room 1. If, however, communication is to be established with zone Z1, which is not equal to the old zone Z2, then the system will assume that the person is now present inside the

room 1, so that the server saves the zone 1 and the addresses of the Bluetooth base station communicate with the mobile terminal. The person may then move freely about in the room 1, and for the greater part of the time his mobile unit will have no communication with the system, which nevertheless knows exactly where he is present.

[0024] Figure 4 shows another use of the invention, which may also be applied e.g. in a very large conference room in which several different antenna zones may be arranged. For example, an antenna coverage zone Z3 enclosing an internal area 6 may be established by means of a plurality of antennas. A further antenna zone Z4 is arranged around the antenna zone Z3, and with reference to the explanation of figures 2 and 3 it will be appreciated that it can be determined with certainty whether a person with a mobile terminal is present within the zone 6 or not. For example, a large exhibition building may be divided into e.g. four zones by means of the embodiment described in connection with figure 4, thereby making it much easier to find a person when three fourths of the area of the exhibition building can be excluded.

[0025] Figure 5 illustrates a further use where the zones Z5 and Z6 are arranged at their respective ends of a corridor 7 that connects two rooms 8 and 9. Thus, it is not necessary that the zones which belong in pairs with a view to the location determination overlap each other. This technique may also be used e.g. in connection with traffic supervision, which is shown schematically in figure 6 which shows a T-road having a cross road with zones 10 and 11 and having zones 12 and 13 and 14 and 15, respectively, at the other roads. It will then be appreciated that the system is very versatile and gives a certain positional determination with a very limited consumption of energy. For example, it is conceivable that the mobile terminal was arranged on a container, and that zones of the present type were established at certain locations on the container terminal where the container crane moves about. Preferably the antenna zones can be established by means of buried leaking cables. The mobile units on the containers are in standby for by far the greatest part of the time, thereby saving power.

[0026] Of course, it is possible to combine the invention with other forms of known location determination systems with a view to error finding. If for example it has been established by the system according to the invention that a person with his mobile terminal is present in the area 9, then it may occasionally be checked whether the signal strength for transmission between the mobile terminal and the area Z6 is greater than the signal strength by communication with the area Z5. This can only be done by occasionally increasing the transmission strength of Z5 and Z6. Another example of this extension of the system according to the invention may be to store a table in the server and an associated program, which can check whether location determinations might

occur that are not in accordance with the current positional determinations. The described examples of error finding procedures will not be of interest in small systems like those which have been described so far, but it will be appreciated that the invention may be used in connection with 10, 25 or even more zones that run in extension e.g. over an industrial area so that it may be determined very easily where a person is present with his mobile terminal.

[0027] It is well known that in so-called WAP telephones information may be transferred from a server to the mobile telephone, where the latter may be controlled in various ways e.g. for transmitting very strong ringing tones in areas which are known to be noisy by the system, and for just emitting vibrations e.g. when a person participates at a meeting. For example, with reference to figure 1, it will be extremely inexpedient if a known positional system was wrong as to whether the person was present on the external or the internal side of the partition wall 3, if there is noise outside, and quietness must prevail inside because of a meeting. In case of an error, the telephone would ring strongly during the meeting. Such "accidents" are avoided by combining the certain location determination according to the invention with a number of facilities involved by the WAP possibilities. Generally the invention results in many advantages not only in connection with WAP but also in connection with any other service offered by GSM and GPRS nets.

Claims

1. A method for location determination of a mobile terminal by means of radio connections which are controlled by a common server, **characterized by** providing a least one pair of different radio zones closely spaced from each other so that distinct directional information transversely to a boundary between the pair of radio zones is provided upon recording of the movement of the mobile terminal in the zones.
2. A method according to claim 1, **characterized in that** a pair of radio zones comprises a first zone and a second zone, and that information is stored in the server defining that the mobile unit is present on one side of said boundary if the mobile unit is first recorded in the second zone and then in the first zone, and defining that the mobile unit is present on the other side of said boundary if the mobile unit is first recorded in the first zone and then in the second zone.
3. A method according to claims 1-2, **characterized in that** the first zone is substantially within an internal zone of a room and the second zone is substantially with an external zone outside said room, and that information is stored in the server defining that the mobile unit is present either at the internal side

or the external side of the boundary between the first and second zones.

4. A method according to claim 1-3, **characterized in that** a first radio zone is extended to surround an internal area, and that a second radio zone surrounds the first radio zone and is positioned within an external area.
5. A method according to claim 4, wherein the internal area is separated from the external area by means of partition walls, **characterized in that** the radio zones are present around the door openings between the internal area and the external area.
6. A method according to claim 2, **characterized in that** the first zone is arranged at one end of a corridor, and that the second zone is arranged at the other end of a corridor, and that information is stored in the server defining that the mobile unit is present outside the one end of the corridor or outside the other end of the corridor.
7. A method according to anyone of the preceding claims, **characterized in that** the server attributes the zone number to a specific area of location in a building based on a table in the server comprising information about walls and doors.
8. A method according to anyone of the preceding claims, **characterized in that** a pair of zones is arranged in a street, and that information is stored in the server defining that the mobile unit is present either at the one side or at the other side of the boundary between the first and second zones of said pair of zones.
9. A method according to anyone of the preceding claims, **characterized in that** a pair of radio zones is arranged in connection with a container terminal, that the individual containers are provided with their respective mobile units, and that information is stored in the server defining that a container is present either at the one side or at the other side of the boundary between a pair of radio zones.
10. A method according to claims 1 - 6, **characterized in that** the radio zones are extended by the use of more antennas.
11. A method according to claims 1-6 in that the radio zones are extended by means of leaking cables.
12. A method according to any one of the preceding claims, **characterized in that** the radio connections are near field connections.
13. A method according to claim 12, **characterized in**

that the radio connection is provided in accordance with a Bluetooth protocol.

14. A method according to anyone of the preceding claims, **characterized in that** a plurality of radio zones is provided, and that the server is used for position determination in relation to the stored information on which and in which directions the mobile unit has passed the radio zones.
15. A method according to claim 12, **characterized in that** the server is adapted to subject the position information to fault-finding by means of look-ups in a table containing previous passages of the boundaries between several pairs of radio zones.
16. A method according to claim 15, **characterized in that** the fault-finding is supplemented with information which is generated on the basis of signal strength measurements in the individual radio zones.
17. A method according to anyone of the preceding claims, **characterized in that** the mobile unit is a mobile telephone with a Bluetooth communications channel.
18. A method according to anyone of the preceding claims **characterized in that** a WAP-pushed mobile telephone is used and that configuration information is sent from the server to the mobile telephone.
19. A computer readable medium containing a program for making a computer decide on the location of a mobile terminal communicating on occasion with a number of base stations having respective predefined antenna coverage zones, **characterized in that** the program comprises the steps of registering a unique mobile terminal number and an identification number of the base station occasionally communicating with the mobile terminal, comparing the registered data with previously registered data and if the zone number is new then the old zone number is replaced by the new zone number, and dedicating the zone number to a predetermined area of location.
20. A medium according to claim 17, **characterized in that** the program comprises a table containing information for attributing the zone number to respective areas of location.
21. A medium according to claim 17, **characterized in that** the program is compatible with a server system for WAP communication.

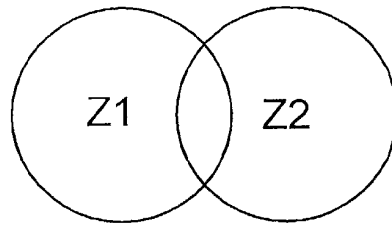


Fig. 1

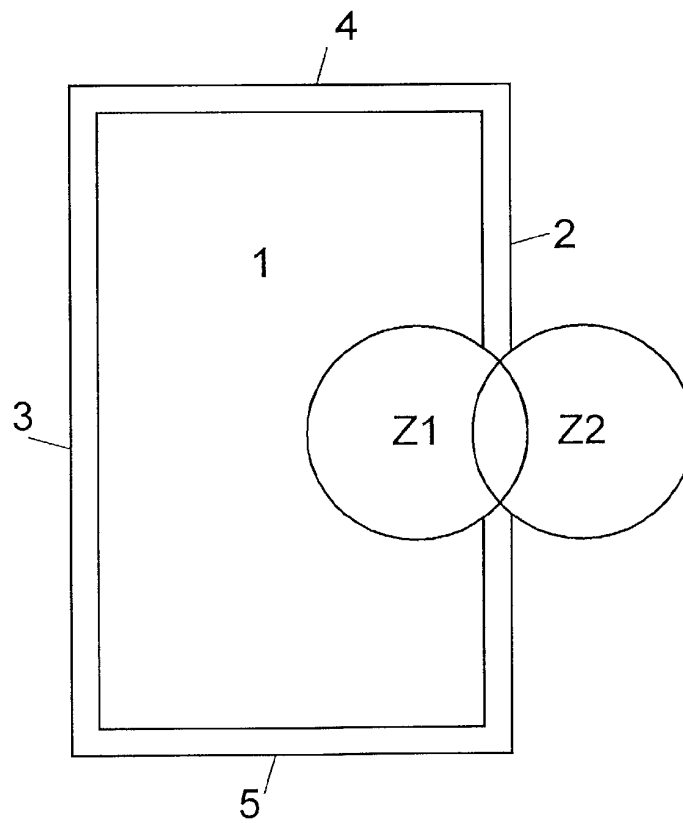


Fig. 2

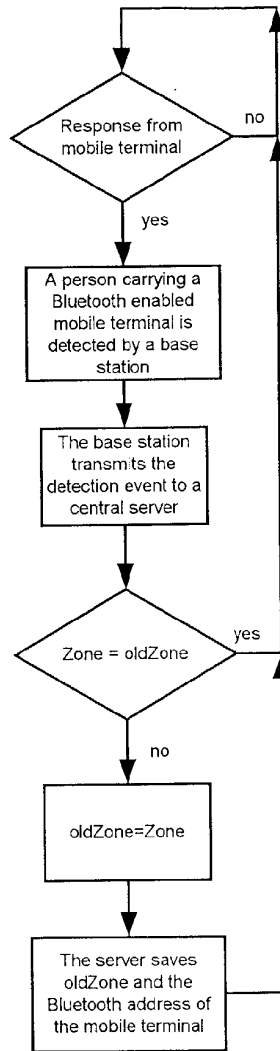


Fig. 3

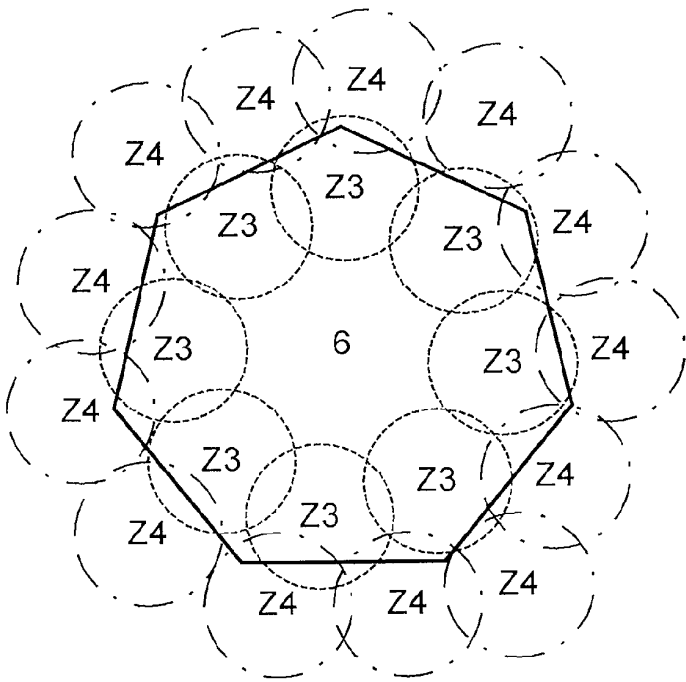


Fig. 4

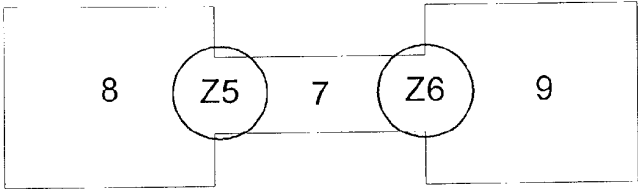


Fig. 5

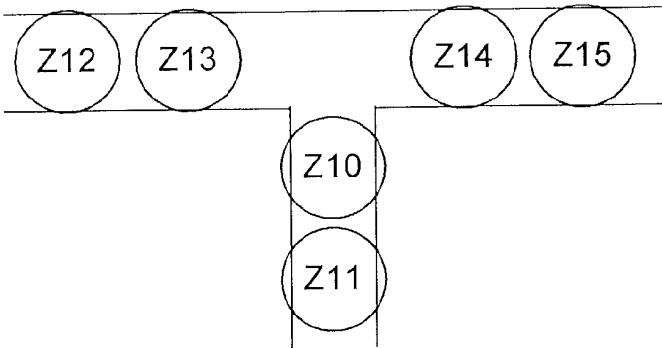


Fig. 6



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 61 0103

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	WO 92 02104 A (BRITISH TELECOMM) 6 February 1992 (1992-02-06) * page 3, line 1 - page 4, line 10 * * page 5, line 25 - page 7, line 27 * * page 9, line 13 - page 10, line 30 * * page 11, line 1 - line 22 * * figures 1-5,7,8,10 *	1-6,8,9, 14,19	H04Q7/38 G01S5/00
X	WO 98 21911 A (ERICSSON TELEFON AB L M) 22 May 1998 (1998-05-22) * page 5, line 3 - line 29 * * page 7, line 3 - line 13 * * page 9, line 19 - line 29 *	1-4,19	
A	US 5 796 351 A (YABUKI TSUTOMU) 18 August 1998 (1998-08-18) * column 1, line 57 - column 2, line 37 * * column 3, line 38 - column 4, line 35 * * figures 1,5,6 *	1-21	
A	US 6 055 434 A (SERAJ JILA) 25 April 2000 (2000-04-25) * column 4, line 25 - column 6, line 34 * * figures 2-4 *	1-21	TECHNICAL FIELDS SEARCHED (Int.Cl.7) H04Q G01S
A	GB 2 353 910 A (IBM) 7 March 2001 (2001-03-07) * page 3, line 3 - page 4, line 3 * * page 4, line 23 - page 6, line 7 * * page 7, line 19 - page 9, line 18 * * figures 2-4 *	1-21	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 15 July 2002	Examiner Pacholec, D
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons B : member of the same patent family, corresponding document			

EPO FORM 1503/03:12 (PAC001)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 61 0103

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

15-07-2002

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
WO 9202104	A	06-02-1992	AU	8232391 A	18-02-1992
			WO	9202104 A1	06-02-1992
WO 9821911	A	22-05-1998	AU	5075698 A	03-06-1998
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GB 2353910	A	07-03-2001	NONE		

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		Signal Comparison-Based Location Determining Method		
First Named Inventor/Applicant Name:		Roy Shkedi		
Filer:		John Alexander Galbreath		
Attorney Docket Number:		B030910		
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	82	82
Utility Search Fee	2111	1	270	270
Utility Examination Fee	2311	1	110	110
Pages:				
Claims:				
Claims in excess of 20	2202	26	26	676
Independent claims in excess of 3	2201	1	110	110
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1248

Electronic Acknowledgement Receipt	
EFS ID:	7173398
Application Number:	12720362
International Application Number:	
Confirmation Number:	8899
Title of Invention:	Signal Comparison-Based Location Determining Method
First Named Inventor/Applicant Name:	Roy Shkedi
Customer Number:	24271
Filer:	John Alexander Galbreath
Filer Authorized By:	
Attorney Docket Number:	B030910
Receipt Date:	09-MAR-2010
Filing Date:	
Time Stamp:	16:45:27
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$1248
RAM confirmation Number	3422
Deposit Account	504432
Authorized User	GALBREATH,JOHN A.
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File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal of New Application	Shkedi-Location-Determining-Method-Continuation-Transmittal.pdf	172508 4bbae42e168d7890070e8c7e376d9226b18e40a8	no	1
Warnings:					
Information:					
2		Shkedi-Location-Determining-Method-Continuation-Spec-Claims-Abstract.pdf	237200 b086e2dc694b9deacd078ca3de8bd9436ef757d9	yes	72
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	59	
	Claims		60	71	
	Abstract		72	72	
Warnings:					
Information:					
3	Drawings-only black and white line drawings	Shkedi-Location-Determining-Method-Continuation-Drawings.pdf	11034 1d9aae9f025b549f1b5199126eb0cf676163c6af	no	1
Warnings:					
Information:					
4	Oath or Declaration filed	Shkedi-Location-Determining-Method-Continuation-Declaration.pdf	184706 e73a04ecfe87816a26a5b0bf7f72d85079d1a9ad	no	2
Warnings:					
Information:					
5	Power of Attorney	Shkedi-Location-Determining-Method-Continuation-POA.pdf	103885 8675118f9adfe8ae053e3913e270fe473a582c81	no	1
Warnings:					
Information:					
6	Information Disclosure Statement (IDS) Filed (SB/08)	Shkedi-Location-Determining-Method-Continuation-IDS.pdf	199835 29e5fa951c7aac58959097e14003b3fac80f1bd	no	2
Warnings:					

Information:					
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7	Foreign Reference	EP1241909.pdf	533637	no	10
			50313dc5708723c9a919e7562147953526393091		
Warnings:					
Information:					
8	NPL Documents	Zhao-article.pdf	148423	no	10
			1d58c70dba45fb40638d36d780eb2a5017530e40		
Warnings:					
Information:					
9	NPL Documents	Hightower-Boriello-article-1.pdf	1950443	no	29
			b299c4b3b46c3d9748edd29e22c396b6b855392e		
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10	NPL Documents	Hightower-Boriello-article-2.pdf	1456863	no	16
			46a1dbf20cd13dc3204eb0cc35fc34aaa3e2a70c		
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11	NPL Documents	Motorola-article.pdf	221939	no	14
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12	Fee Worksheet (PTO-875)	fee-info.pdf	37851	no	2
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Warnings:					
Information:					
Total Files Size (in bytes):			5258324		

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National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Date: 03/08/10

Approved for use through 7/31/2006. OMB 0651-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 12/720,362	
APPLICATION AS FILED – PART I					
(Column 1)		(Column 2)			
FOR	NUMBER FILED	NUMBER EXTRA			
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A			
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A			
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A			
TOTAL CLAIMS (37 CFR 1.16(i))	46	minus 20 =		26	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	4	minus 3 =		1	
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$260 (\$130 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR				
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.					
APPLICATION AS AMENDED – PART II					
(Column 1)		(Column 2)		(Column 3)	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		
	Total (37 CFR 1.16(i))	*	Minus	**	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=
	Application Size Fee (37 CFR 1.16(s))				
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))				
(Column 1)		(Column 2)		(Column 3)	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		
	Total (37 CFR 1.16(i))	*	Minus	**	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=
	Application Size Fee (37 CFR 1.16(s))				
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))				

SMALL ENTITY	
RATE (\$)	FEE (\$)
N/A	82
N/A	270
N/A	110
x\$26	676
x\$110	110
195	
TOTAL	1248

OR

OTHER THAN SMALL ENTITY	
RATE (\$)	FEE (\$)
N/A	
N/A	
N/A	
x\$52	
x\$220	
390	
TOTAL	

SMALL ENTITY	
RATE (\$)	ADDITIONAL FEE (\$)
X =	
X =	
N/A	
TOTAL ADD'T FEE	

OR

OTHER THAN SMALL ENTITY	
RATE (\$)	ADDITIONAL FEE (\$)
X =	
X =	
N/A	
TOTAL ADD'T FEE	

SMALL ENTITY	
RATE (\$)	ADDITIONAL FEE (\$)
X =	
X =	
N/A	
TOTAL ADD'T FEE	

OR

OTHER THAN SMALL ENTITY	
RATE (\$)	ADDITIONAL FEE (\$)
X =	
X =	
N/A	
TOTAL ADD'T FEE	

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