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PATENT TRADEMARK OFFICE

CHAPTER II

TRANSMITTAL LETTER TO THE UNITED STATES ELECTED OFFICE (EO/US)

(ENTRY INTO U.S. NATIONAL PHASE UNDER CHAPTER II)

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/AU2005/001351	31 AUGUST 2005	02 SEPTEMBER 2004

TITLE OF INVENTION

SELF MONITORING GPS ON MOBILE DEVICE

APPLICANT(S)

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

ATTENTION: EO/US

CERTIFICATION UNDER 37 C.F.R. 1.10*
*(Express Mail label number is **mandatory**.)*
(Express Mail certification is optional.)

I hereby certify that this correspondence and the documents referred to as attached therein are being deposited with the United States Postal Service on this date **March 1, 2007**, in an envelope as "Express Mail Post Office to Addressee," Mailing Label Number **EV 927 568 293 US**, addressed to the: Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.

Geraldine Marti
(type or print name of person mailing paper)
Geraldine Marti
Signature of person mailing paper

WARNING: *Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R. 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.*

***WARNING:** *Each paper or fee filed by "Express Mail" **must** have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. 1.10(b).*
*"Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will **not** be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.*

EXPRESS MAIL LABEL NO.: EV 927 568 293 US

EXHIBIT
2002

Page 1 of 448 (IPR2023-01374)
Google LLC et al v. Nariste Networks Pty. Ltd.

*NOTE: To avoid abandonment of the application, the applicant shall furnish to the USPTO, not later than the expiration of **30** months from the priority date: (1) a copy of the international application, unless it has been previously communicated by the International Bureau or unless it was originally filed in the USPTO; and (2) the basic national fee (see 37 C.F.R. § 1.492(a)). The 30-month time limit may not be extended. 37 C.F.R. § 1.495(a) and (b).*

WARNING: *Where the items are those which can be submitted to complete the entry of the international application into the national phase are subsequent to 30 months from the priority date the application is still considered to be in the international state and if mailing procedures are utilized to obtain a date the express mail procedure of 37 C.F.R. §1.10 must be used (since international application papers are not covered by an ordinary certificate of mailing - See 37 C.F.R. §1.8.*

NOTE: Documents and fees must be clearly identified as a submission to enter the national state under 35 USC 371 otherwise the submission will be considered as being made under 35 USC 111. 37 C.F.R. § 1.494(f).

1. Applicant herewith submits to the United States Elected Office (EO/US) the following items under 35 U.S.C. 371:

a. [X] This express request to immediately begin national examination procedures (35 U.S.C. 371(f)).

b. [X] The U.S. National Fee (35 U.S.C. 371(c)(1)) and other fees (37 C.F.R. § 1.492) as indicated below:

c. [ ] **ADDED PAGES FOR APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED**

NOTE: § 1.495 Entering the national stage in the United States of America.

(a) The applicant in an international application must fulfill the requirements of 35 U.S.C 371 within the time periods set forth in paragraphs (b) and (c) of this section in order to prevent the abandonment of the international application as to the United States of America. The thirty month time period set forth in paragraphs (b), (c) (d), (e) and (h) of this section may not be extended. International applications for which those requirements are timely fulfilled will enter the national stage and obtain an examination as to the patentability of the invention in the United States of America.

(b) To avoid abandonment of the application, the applicant shall furnish to the United Stats Patent and Trademark Office not later than the expiration of thirty months from the priority date:

(1) A copy of the international application, unless it has been previously communicated by the International Bureau or unless it was originally filed in the United States Patent and Trademark Office; and

(2) The basic national fee (see § 1.492(a)).

(c)(1) If applicant complies with paragraph (b) of this section before expiration of thirty months from the priority date, the Office will notify the applicant if he or she has omitted any of:

(i) A translation of the international application, as filed, into the English language, if it was originally filed in another language (35 U.S.C. 371(c)(2));

(ii) The oath or declaration of the inventor (35 U.S.C. 371(c)(4) and § 1.497), if a declaration of inventorship in compliance with § 1.497 has not been previously submitted in the international application under PCT Rule 4.17 (iv) within the time limits provided for in PCT Rule 26ter.1;

(ii) The search fee set forth in § 1.492(c); and

(iv) The examination fee set forth in § 1.492(c); and

(v) Any application size fee required by § 1.492(j)

(2) A notice under paragraph (c)(1) of this section will set a period of time within which applicant must provide any omitted translation, oath or declaration of the inventor, search fee set forth in § 1.492(b), examination fee set forth in § 1.492(c), and any application size fee required by § 1.492(j) in order to avoid abandonment of the application.

(3) The payment of the processing fee set forth in § 1.492(i) is required for acceptance of English translation later than the expiration of thirty months after the priority date. The payment of the surcharge set forth in § 1.429(h) is required for acceptance of the oath or declaration the inventor later than the expiration of thirty months after the priority date.

2. Fees

CLAIMS FEE *	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
	TOTAL CLAIMS*	40 - 20 =	20	x $ 50.00 =	**$ 1,000.00 Not paid at this time**
	INDEPENDENT CLAIMS*	5 - 3 =	2	x $ 200.00 =	**400.00 Not paid at this time**
	MULTIPLE DEPENDENT CLAIM(S) (if applicable) + $360.00				
FILING FEES**	[x] Basic filing Fee				$300.00
	[x] Non-U.S. Search Report filed			($400.00)	$400.00
	[ ] No Search Report			($500.00)	
	[x] Exam Fee not paid to U. S.			($200.00)	$200.00
	[ ] Search and Exam fee with U.S. WO or IPER conditions not satisfied			($100.00)	
	[ ] Search and Exam fee with U.S. WO or IPER conditions satisfied			($0.00)	
	[ ] Additional fee for specification and drawings filed in paper over 100 sheets (excluding sequence listing or computer program listing filed in electronic medium). The fee is $250 for each additional 50 sheets paper or fraction thereof			($)	
	Total of above Calculations				=$900.00
SMALL ENTITY	Reduction by ½ for filing by small entity, if applicable. Statement may also be filed. (note 37 CFR 1.9, 1.27, 1.28)				-$450.00
	Subtotal				$450.00
	Total National Fee				$450.00
	Fee for recording the enclosed assignment document $40.00 (37 CFR 1.21(h)). (See Item 13 below). See attached "ASSIGNMENT COVER SHEET".				
TOTAL	Total Fees enclosed				$450.00

*May include Preliminary Amendment (see page 8) reducing the number of claims.

i. [x] A check in the amount of $ 450.00 to cover the above fees is enclosed.
ii. [ ] Please charge Account No. 12-0425 in the amount of $
A duplicate copy of this sheet is enclosed.

**WARNING: *"To avoid abandonment of the application the applicant shall furnish to the United States Patent and Trademark Office not later than the expiration of 30 months from the priority date: * * * (2) the basic national fee (see § 1.492(a)). The 30-month time limit may not be extended." 37 C.F.R. § 1.495(b).*

WARNING: *If the translation of the international application and/or the oath or declaration have not been submitted by the applicant within thirty (30) months from the priority date, such requirements may be met within a time period set by the Office. 37 C.F.R. § 1.495(b)(2). The payment of the surcharge set forth in § 1.492(e) is required as a condition for accepting the oath or declaration later than thirty (30) months after the priority date. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than thirty (30) months after the priority date. Failure to comply with these requirements will result in abandonment of the application. The provisions of § 1.136 apply to the period which is set. Notice of Jan. 3, 1993, 1147 O.G. 29 to 40.*

[x] Assertion of Small Entity Status

[x] Applicant hereby asserts status as a small entity under 37 C.F.R. § 1.27 by.
[ ] a Statement or Written Assertion attached.
[x] fee payment

NOTE: *37 C.F.R. § 1.27(c) deals with the assertion of small entity status, whether by a written specific declaration thereof or by payment as a small entity of the basic filing fee or the fee for the entry into the national phase as states:*

"(c) Assertion of small entity status. Any party (person, small business concern or nonprofit organization) should make a determination, pursuant to paragraph (f) of this section, of entitlement to be accorded small entity status based on the definitions set forth in paragraph (a) of this section, and must, in order to establish small entity status for the purpose of paying small entity fees, actually make an assertion of entitlement to small entity status, in the manner set forth in paragraph (c)(1) or (c)(3) of this section, in the application or patent in which such small entity fees are to be paid.

(1) Assertion by writing. Small entity status may be established by a written assertion of entitlement to small entity status. A written assertion must:

(i) Be clearly identifiable;

(ii) Be signed (see paragraph (c)(2) of this section); and

(iii) Convey the concept of entitlement to small entity status, such as by stating that applicant is a small entity, or that small entity status is entitled to be asserted for the application or patent. While no specific words or wording are required to assert small entity status, the intent to assert small entity status must be clearly indicated in order to comply with the assertion requirement.

(2) Parties who can sign and file the written assertion. The written assertion can be signed by:

(i) One of the parties identified in §§ 1.33(b) (e.g., an attorney or agent registered with the Office), §§ 3.73(b) of this chapter notwithstanding, who can also file the written assertion;

(ii) At least one of the individuals identified as an inventor (even though a §§ 1.63 executed oath or declaration has not been submitted), notwithstanding §§ 1.33(b)(4), who can also file the written assertion pursuant to the exception under §§ 1.33(b) of this part; or

(iii) An assignee of an undivided part interest, notwithstanding §§ 1.33(b)(3) and 3./73(b) of this chapter, but the partial assignee cannot file the assertion without resort to a party identified under §§ 1.33(b) of this part.

(3) Assertion by payment of the small entity basic filing or basic national fee. The payment, by any party, of the exact amount of one of the small entity basic filing fees set forth in §§ 1.16(a), (f), (g), (h), or (k), or one of the small entity basic national fees set forth in §§ 1.492(a)(1), (a)(2), (a)(3), (a)(4) or (a)(5), will be treated as a written assertion of entitlement to small entity status even if the type of basic filing or basic national fee is inadvertently selected in error.

(i) If the Office accords small entity status based on payment of a small entity basic filing or basic national fee under paragraph (c)(3) of this section that is not applicable to that application, any balance of the small entity fee that is applicable to that application will be due along with the appropriate surcharge set forth in §§ 1.16(e) or §§ 1.16(l).

(ii) The payment of any small entity fee other than those set forth in paragraph (c)(3) of this section (whether in the exact fee amount or not) will not be treated as a written assertion of entitlement to small entity status and will not be sufficient to establish small entity status in an application or a patent."

3. [x] A copy of the International application as filed (35 U.S.C. 371(c)(2)):

NOTE: Section 1.495 (b) was amended to require that the basic national fee and a copy of the international application must be filed with the Office by 30 months from the priority date to avoid abandonment "The International Bureau normally provides the copy of the international application to the Office in accordance with PCT Article 20. At the same time, the International Bureau notifies applicant of the communication to the Office. In accordance with PCT Rule 47.1, that notice shall be accepted by all designated offices as conclusive evidence that the communication has duly taken place. Thus, if the applicant desires to enter the national stage, the applicant normally need only check to be sure the notice from the International Bureau has been received and then pay the basic national fee by 30 months from the priority date." Notice of Jan. 7, 1993, 1147 O.G. 29 to 40, at 35-36. See item 14c below.

a. [ ] is transmitted herewith.
b. [ ] is not required, as the application was filed with the United States Receiving Office.
c. [x] has been transmitted
   i. [x] by the International Bureau.
   Date of mailing of the application (from form PCT/IB/308): 04 January 2007
   ii. [ ] by applicant on _____
   Date

4. [x] A translation of the International application into the English language (35 U.S.C. 371(c)(2)):
a. [ ] is transmitted herewith.
b. [x] is not required as the application was filed in English.
c. [ ] was previously transmitted by applicant on
   Date
d. [ ] will follow.

*NOTE: 37 C.F.R. § 1.495(c): "If applicant complies with paragraph (b) of this section before expiration of **thirty** months from the priority date but omits . . . a translation of the international application, as filed, into the English language, if it was originally filed in another language (35 U.S.C. 371(c)(2)) . . . applicant will be so notified and given a period of time within which to file the translation . . . in order to prevent abandonment of the application. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than the expiration of **thirty** months after the priority date . . . . A 'Sequence Listing' need not be translated if the "Sequence Listing' complies with PCT Rule 12.1(d) and the description complies with PCT Rule 5.2(b)."*

5. [x] Amendments to the claims of the International application under PCT Article 19 (35 U.S.C. 371(c)(3)):

NOTE: The Notice of January 7, 1993 points out that 37 C.F.R. § 1.495(a) was amended to clarify the existing and continuing practice that PCT Article 19 amendments must be submitted by 30 months from the priority date and this deadline may not be extended. The Notice further advises that: "The failure to do so will not result in loss of the subject matter of the PCT Article 19 amendments. Applicant may submit that subject matter in a preliminary amendment filed under section 1.121. In many cases, filing an amendment under section 1.121 is preferable since grammatical or idiomatic errors may be corrected." 1147 O.G. 29-40, at 36.

*NOTE: 37 C.F.R. § 1.495(d): "A copy of any amendments to the claims made under PCT Article 19, and a translation of those amendments into English, if they were made in another language, must be furnished not later than the expiration of **thirty** months from the priority date. Amendments under PCT Article 19 which are not received by the expiration of **thirty** months from the priority date will be considered to be canceled."*

a. [ ] are transmitted herewith.
b. [X] have been transmitted
   i. [X] by the International Bureau.
   Date of mailing of the amendment (from form PCT/IB/308):
   ii. [ ] by applicant on _____.
   Date
c. [ ] have not been transmitted as
   i. [x] applicant chose not to make amendments under PCT Article 19.
   Date of mailing of Search Report (from form PCT/ISA/210): 14 October 2005.
   ii. [ ] the time limit for the submission of amendments has not yet expired. The amendments or a statement that amendments have not been made will be transmitted before the expiration of the time limit under PCT Rule 46.1.

6. [x] A translation of the amendments to the claims under PCT Article 19 (38 U.S.C. 371(c)(3)):
a. [ ] is transmitted herewith.
b. [ ] will follow
c. [X] is not required as the amendments were made in the English language.
d. [ ] has not been transmitted for reasons indicated at point 5(c) above.

7. [x] A copy of the international examination report (PCT/IPEA/409)
[x] is transmitted herewith.
[ ] is not required as the application was filed with the United States Receiving Office.

8. [ ] Annex(es) to the international preliminary examination report
a. [ ] is/are transmitted herewith.
b. [ ] is/are not required as the application was filed with the United States Receiving Office.

9. [ ] A translation of the annexes to the international preliminary examination report

*NOTE: 37 C.F.R. § 1.497(e) "A translation into English of any annexes to an international preliminary examination report (if applicable), if the annexes were made in another language, must be furnished not later than the expiration of **thirty** months form the priority date. Translations of the annexes which are not received by the expiration of **thirty** months from the priority date may be submitted within any period set pursuant to paragraph (c) of this section accompanied by the processing fee set forth in § 1.492(f). Annexes for which translations are not timely received will be considered canceled."*

a. [ ] is transmitted herewith.
b. [ ] is not required as the annexes are in the English language.

10. [x] An oath or declaration of the inventor (35 U.S.C. 371(c)(4)) complying with 35 U.S.C. 115
a. [ ] was previously submitted by applicant on
Date
b. [ ] is submitted herewith, and such oath or declaration
i. [ ] is attached to the application.
ii. [ ] identifies the application and any amendments under PCT Article 19 that were transmitted as stated in points 3(b) or 3(c) and 5(b); and states that they were reviewed by the inventor as required by 37 C.F.R. 1.70.
c. [x] will follow.

*NOTE: 37 C.F.R. § 1.495(c): "If applicant complies with paragraph (b) of this section before expiration of **thirty** months from the priority date but omits . . . the oath or declaration of the inventor (35 U.S.C. 371(c)(4) and § 1.497), if a declaration of inventorship in compliance with § 1.497 has not been previously submitted in the international application under PCT Rule 4.17(iv) within the time limits provided for in PCT Rule 26ter.1, applicant will be so notified and given a period of time within which to file the . . . oath or declaration in order to prevent abandonment of the application . . . . The payment of the surcharge set forth in § 1.492(e) is required for acceptance of the oath or declaration of the inventor later than the expiration of **thirty** months after the priority date."*

Other document(s) or information included:

11. [x] An International Search Report (PCT/ISA/210) or Declaration under PCT Article 17(2)(a):
a. [ ] is transmitted herewith.
b. [ ] has been transmitted by the International Bureau.
Date of mailing (from form PCT/IB/308):
c. [ ] is not required, as the application was searched by the United States International Searching Authority.
d. [ ] will be transmitted promptly upon request.
e. [ ] has been submitted by applicant on
Date

12. [x] An Information Disclosure Statement under 37 C.F.R. 1.97 and 1.98:
a. [x] is transmitted herewith.
Also transmitted herewith is/are:
[x] Form PTO-1449 (PTO/SB/08A and 08B).
[x] Copies of citations listed.
b. [ ] will be transmitted within THREE MONTHS of the date of submission of requirements under 35 U.S.C. 371(c).
c. [ ] was previously submitted by applicant on _____.
Date

13. [ ] An assignment document is transmitted herewith for recording.

A separate [ ] "COVER SHEET FOR ASSIGNMENT (DOCUMENT) ACCOMPANYING NEW PATENT APPLICATION" or [ ] FORM PTO 1595 is also attached.

14. [ ] Additional documents:
- a. [ ] Copy of request (PCT/RO/101)
- b. [x] International Publication No. **WO 2006/024112 A1**
  - i. [x] Specification, claims and drawing
  - ii. [ ] Front page only
- c. [ ] Preliminary amendment (37 C.F.R. § 1.121)
- d. [x] Other
  1. FORM PCT/IB/304
  2. FORM PCT/IB/306 (MAILED 07 JULY 2006)
  3. FORM PCT/IB/306 (MAILED 05 FEBRUARY 2007)
  4. FORM PCT/IPEA/401

15. [x] The above checked items are being transmitted
- a. [x] before 30 months from any claimed priority date.
- b. [ ] after 30 months.

16. [ ] Certain requirements under 35 U.S.C. 371 were previously submitted by the applicant on
, namely:

AUTHORIZATION TO CHARGE ADDITIONAL FEES

WARNING: *Accurately count claims, especially multiple dependent claims, to avoid unexpected high charges if extra claims are authorized.*

NOTE: *"A written request may be submitted in an application that is an authorization to treat any concurrent or future reply, requiring a petition for an extension of time under this paragraph for its timely submission, as incorporating a petition for extension of time for the appropriate length of time. An authorization to charge all required fees, fees under § 1.17, or all required extension of time fees will be treated as a constructive petition for an extension of time in any concurrent or future reply requiring a petition for an extension of time under this paragraph for its timely submission. Submission of the fee set forth in § 1.17(a) will also be treated as a constructive petition for an extension of time in any concurrent reply requiring a petition for an extension of time under this paragraph for its timely submission." 37 C.F.R. § 1.136(a)(3).*

NOTE: *"Amounts of twenty-five dollars or less will not be returned unless specifically requested within a reasonable time, nor will the payer be notified of such amounts; amounts over twenty-five dollars may be returned by check or, if requested, by credit to a deposit account." 37 C.F.R. § 1.26(a).*

[X] The Commissioner is hereby authorized to charge the following additional fees that may be required by this paper and during the entire pendency of this application to Account No. 12-0425 .

[X] 37 C.F.R. 1.492(a)(1) (basic filing fee)

WARNING: *Because failure to pay the national fee within 30 months without extension (37 C.F.R. § 1.495(b)(2)) results in abandonment of the application, it would be best to always check the above box.*

[ ] 37 C.F.R. 1.492(b) (search fee)
[ ] 37 C.F.R. 1.492(b) (exam fee)
[ ] 37 C.F.R. 1.492(b) (claim fees)

NOTE: Because additional fees for excess or multiple dependent claims not paid on filing or on later presentation must only be paid or these claims cancelled by amendment prior to the expiration of the time period set for response by the PTO in any notice of fee deficiency (37 C.F.R. § 1.492(d)), it might be best not to authorize the PTO to charge additional claim fees, except possible when dealing with amendments after final action.

[X] 37 C.F.R. 1.16(s) (spec and drawing, each 50 pages over 100)
[X] 37 C.F.R. 1.17 (application processing fees)
[X] 37 C.F.R. 1.17(a)(1)-(5) (extension fees pursuant to § 1.136(a).

NOTE: 37 C.F.R. 1.28(b) requires "Notification of any change in loss of entitlement to small entity status must be filed in the application . . . prior to paying, or at the time of paying . . . issue fee." From the wording of 37 C.F.R. § 1.28(b): (a) notification of change of status must be made even if the fee is paid as "other than a small entity" and (b) no notification is required if the change is to another small entity.

[ ] 37 C.F.R. § 1.492(e) and (f) (surcharge fees for filing the declaration and/or filing an English translation of an International Application later than 30 months after the priority date).

[X] Please credit any overpayments to deposit account 12-0425.

SIGNATURE OF PRACTITIONER

Reg. No.:25,858

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(type or print name of practitioner)

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New York, N.Y. 10023

00140
PATENT TRADEMARK OFFICE

IAP8 Rec'd PCT/PTO 01 MAR 2007

SELF MONITORING GPS ON MOBILE DEVICE

FIELD OF THE INVENTION

The present invention relates generally to GPS acquisition and in particular to power conservation for GPS-enabled devices.

BACKGROUND

Techniques for the positioning of mobile devices in a wireless environment are important for a number of applications, such as emergency location services, ad hoc networks, and vehicle tracking.

In the mobile phone industry, competing technologies address the specific issues of Emergency-911 (E-911) position location. Broadly speaking, these technologies fall into two categories: (1) network-based technologies and (2) Global Positioning Systems (GPS) technologies. The network-based technologies use network-based metrics (e.g., time of flight, angle of arrival etc). The GPS technologies use line-of-sight measurements to satellites.

Network-based and GPS technologies each attempt to meet the US Federal Communications Commission (FCC) requirements for E-911 Emergency Location Services. The FCC requirements set specific statistical requirements on the position accuracy on any technology. Currently the FCC's E-911 Phase II Plans dictate that 67% of all attempts for a position location must have an accuracy of less than 50m, and 95% of calls must have an accuracy of less than 150m (Federal Communications Commission E-911 http://www.fcc.gov/911/enhanced/). Although not mandated, it is generally accepted that acquisition time of a position fix must be in a reasonably short time scale. A positioning technology that can deliver a position fix within a timescale of 30 seconds is generally considered reasonable for E-911 services, since such a small amount of time has negligible impact on the total time taken for the emergency services to reach the emergency scene.

GPS-based techniques are known to provide accurate position measurements. However, such techniques are prone to a lengthy GPS acquisition time (the length of

time taken from the time a GPS device is powered on until that device obtains a position fix). A principal reason for this is that the device does not know *a priori* which GPS satellites are currently in view and must undertake an exhaustive search to find the satellites in view. This is termed a "cold start". Generally speaking in cold start mode, a GPS device can take up to several minutes to find a location fix, which is a time-scale deemed inappropriate for many applications, such as E-911.

One simple approach to overcome this difficulty involves simply keeping the GPS device switched on at all times. After an initial fix, the satellite almanac and ephemeris data are continuously kept up-to-date, and a cold start phase can be avoided. In this mode, the GPS device is said to be in "hot start" mode. A principal disadvantage of always keeping the device in a hot-start mode is the drain on the battery resources of the mobile device. Battery power in a mobile device is a precious resource, and any steps that can be taken to maximize battery life are advantageous. Simply keeping a GPS device powered on at all times to avoid the cold start is generally considered an unacceptable solution. This is particularly the case for an application like E-911, where the GPS location finding capability is likely to be only rarely utilized.

A potential resolution to the problem of cold starts can be found in the Assisted-GPS (A-GPS) system proposed by Qualcomm; see Qualcomm White Paper, *How A-GPS Works*, 2001 (http://www.snaptrack.com/pdf/How_aGPS_works.pdf). In this system, the network "assists" the mobile device by transferring updated almanacs and ephemeris, collected by base stations, to the mobile device upon receipt of a location request. This speeds up the GPS acquisition of a mobile device relative to the acquisition from a cold start. The system also integrates network positioning information to find optimal position accuracy. However, this approach at attempting to solve the cold start problem comes at the cost of increased complexity in the network system design and incurs additional costs for the required extra infrastructure (i.e. network hardware and communications). This system is also not workable if the mobile device is disconnected from a network, but still requires a GPS position fix.

Another system attempting to address cold start is the use of periodic power-down of the GPS device. In this mode, the device is periodically switched off for a

set period. As long as the time switched off remains small, at each onset of the power-up phase, the GPS device effectively commences in hot start mode. This periodic power-down of a GPS device is termed "TricklePower" by GPS chipset manufacturers; see Laipac Technology Inc., *Reference Guideline to TF GPS,* Sept 2001, (http://www.laipac.com/datasheets/gps/TF%20GPS%20Series.pdf). In this mode, a user is allowed to set initially the power-up period, P_u. For example, setting $P_u = 30$ minutes means the GPS device powers up every 30 minutes to acquire a position fix. Once the fix is obtained (usually within seconds), the GPS device enters power-down mode.

Simply guessing what value to set P_u at is not optimal. A need clearly exists for an improved GPS acquisition system.

SUMMARY

According to an aspect of the present invention, there is provided a method of acquiring GPS on a mobile device possessing GPS capability. The method comprises the step of setting a current value of the period of the power-up phase of the GPS dependent upon adaptive predictions of when the GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

According to another aspect of the present invention, there is provided a mobile device. The mobile device comprises a processor and memory coupled to the processor; a GPS module coupled to the processor providing a GPS capability for the mobile device; and means for setting a current value of the period of the power-up phase of the GPS module dependent upon adaptive predictions of when the GPS module should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

According to yet another aspect of the present invention, there is provided a computer program product for a mobile device possessing GPS capability. The computer program product having a computer readable medium storing a computer program for acquiring GPS on the mobile device. The computer program product comprises computer program code means for interfacing with the GPS capability of the mobile device and computer program code means for setting a current value of a

period of the power-up phase of the GPS module dependent upon adaptive predictions of when the GPS module should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

According to yet another aspect of the present invention, there is provided a method of acquiring GPS on a mobile device possessing GPS capability. The method comprises the steps of using a position error between a predicted position and an actual position of the mobile device at a last position fix; if the position error is too large, adjusting a current value of the period of the power-up phase downward; if the position error is too small, adjusting the current value of the period of the power-up phase upward; estimating using a neural network a new value of the period of the power-up phase dependent upon the position error and setting a new value of the period of the power-up phase to a weighted value dependent upon an acceptable error bound.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the invention are described hereinafter by way of example with reference to the drawings, in which:

Fig. 1 is an image of a GPS-equipped mobile device with which an embodiment of the invention may be practiced;

Fig. 2 is a high-level block diagram of a system for adaptively predicting when a GPS-enable wireless communication device should be powered on in accordance with an embodiment of the invention;

Fig. 3 is a flowchart illustrating a method for determining position errors in accordance with an embodiment of the invention;

Fig. 4 is a flowchart illustrating a method of determining the value of P_u to satisfy position accuracy bounds in accordance with the embodiment of the invention;

Fig. 5 is a flowchart illustrating a method of determining the value of P_u to satisfy GPS acquisition time bounds; and

Fig. 6 is a block diagram of a general-purpose computer system with which embodiments of the invention may be practiced.

DETAILED DESCRIPTION

Methods, apparatuses, and computer program products for energy efficient GPS acquisition on a mobile device are disclosed. The acquisition meets pre-assigned statistical accuracy and acquisition time. In the following description, numerous specific details, including particular wireless networks, positioning systems, network configurations, filtering techniques, and the like are set forth. However, from this disclosure, it will be apparent to those skilled in the art that modifications and/or substitutions may be made without departing from the scope and spirit of the invention. In other circumstances, specific details may be omitted so as not to obscure the invention.

The methods may be implemented in modules. A module, and in particular its functionality, can be implemented in either hardware or software. In the software sense, a module is a process, program, or portion thereof that usually performs a particular function or related functions. Such software may be implemented in C, C++, JAVA, JAVA BEANS, Fortran, or a combination thereof, for example, but may be implemented in any of a number of other programming languages/systems, or combinations thereof. In the hardware sense, a module is a functional hardware unit designed for use with other components or modules. For example, a module may be implemented using discrete electronic components, or it may form at least a portion of an entire electronic circuit such as a Field Programmable Gate Arrays (FPGA), Application Specific Integrated Circuit (ASIC), and the like. A physical implementation may also comprise configuration data for a FPGA, or a layout for an ASIC, for example. Still further, the description of a physical implementation may be in EDIF netlisting language, structural VHDL, structural Verilog, or the like. Numerous other possibilities exist. Those skilled in the art will appreciate that the system may also be implemented as a combination of hardware and software modules.

Some portions of the following description are presented in terms of algorithms and representations of operations on data within a computer system or other device capable of performing computations. Such algorithmic descriptions and representations may be used by those skilled in the art to convey the substance of their work to others skilled in the art. An algorithm is a self-consistent sequence of steps

leading to a desired result. The steps are those requiring physical manipulations of physical quantities. Usually, though not necessarily, these quantities take the form of electrical, magnetic, or electromagnetic signals capable of being stored, transferred, combined, compared, and otherwise manipulated. These signals may be referred to as bits, values, elements, symbols, characters, terms, numbers, or the like.

The above and similar terms are to be associated with the appropriate physical quantities and are merely convenient labels applied to such quantities. Unless specifically stated otherwise, and as apparent from the following, discussions utilizing terms such as "receiving", "calculating", "predicting", "comparing", "determining", "storing", "adjusting", "using", "estimating", "setting" or the like, refer to the action and processes of a computer system, or a similar electronic device. Such a system or device manipulates and transforms data represented as physical quantities within the registers and memories of the computer system into other data similarly represented as physical quantities within the computer system registers, memories, or another form of storage, transmission or display devices.

Apparatuses and systems for performing the operations of the methods are also described. Such an apparatus may be specifically constructed for the required purpose. Alternatively, the apparatus may comprise a general-purpose computer (e.g., a notebook PC) or another computing device (e.g., a PDA), which may be selectively activated or reconfigured by a computer program read by the computer. The algorithms presented herein are not inherently related to any particular computer or other apparatus; various general-purpose machines may be used with programs.

The embodiments of the invention also relate to a computer program(s) or software, in which method steps may be put into effect by computer code. The computer program is not intended to be limited to any particular programming language, operating environment, and implementation thereof. A variety of programming languages, operating systems, and coding thereof may be used. Moreover, the computer program is not intended to be limited to any particular control flow. There are many other variants of the computer program, which can use different control flows without departing the scope and spirit of the invention.

Furthermore, one or more of the steps of the computer program may be performed in parallel rather than sequentially.

The computer program may be stored on any computer readable medium. The computer readable medium may comprise storage devices, such as magnetic media disks, CD-ROMs, DVDs, flash RAM devices, memory chips, memory cards, magnetic tape, other storage devices and media suitable for interfacing with and being read by a general-purpose computer, and combinations thereof. The computer readable medium may also include a hard-wired medium, such as a local area network or the Internet, or wireless medium, such as an IEEE 802.11 wireless network, BlueTooth, a GSM mobile telephone system, PCS, and GPS. The computer program when loaded and executed on such a general-purpose computer effectively results in an apparatus that implements the method steps of the embodiments.

The methods of the embodiments comprise particular control flows. However, different control flows can be practiced without departing from the scope and spirit of the invention.

I. Introduction

Hereinafter, the next "power-up time" means the time derived by adding the current value of P_u to the time at which a power down occurs. The embodiments of the invention systematically set the period of the power-up phase, P_u, whilst retaining the accuracy of the position fix and the acquisition times of the position fix within acceptable bounds.

Adaptive predictions are made of when a GPS device, embedded in a wireless communication device, should be powered on to meet specifications on positioning accuracy and GPS acquisition time. The embodiments of the invention address the issue of setting the period of the power-up phase, P_u, whilst retaining the accuracy of the position fix and the acquisition times of the position fix within acceptable bounds. Simply setting P_u to some value at the onset of operation may provide the required bounds for some time epoch, but there is no guarantee that this will also be the case in the future. Also, this simple approach provides no sense of an optimized value of P_u.

By this, what is meant is the maximum value of P_u allowable whilst still retaining the accuracy of the position fix and the acquisition times of the position fix within acceptable bounds. An example of an inefficient system design would be a GPS system reporting positions every second when an acceptable error bound (accuracy) of 50 meters was required on a device moving at 1 meter per second. The embodiments of the invention allow a GPS device to determine dynamically an optimal P_u in response to such a circumstance.

The methods and apparatuses in accordance with embodiments of the invention address these issues, using adaptive-filter and machine-learning techniques within the mobile device. These techniques allow the mobile device to self monitor the predicted accuracy error and the predicted acquisition times of the GPS device. If these predicted values fail to meet acceptable bounds, the value of P_u is reduced. If the predicted values meet the acceptable bounds, the value of P_u is increased. The embodiments of the invention provide a technology referred to hereinafter as Self Monitored (SM) – GPS. Although applicable to E-911 services, SM-GPS is equally applicable to any mobile GPS device. SM-GPS allows such a device to operate in the most energy efficient way whilst still retaining the position accuracy and acquisition times deemed appropriate by the operator of the GPS device.

The embodiments of the invention assist a mobile device in GPS position acquisition in the most energy efficient way, whilst still retaining the position accuracy and acquisition times deemed appropriate by the operator of the GPS device. In this context, "mobile device" means a power limited (*e.g.* battery operated) device possessing embedded GPS capability. Examples of such devices are GPS-capable mobile telephones, laptop computers, Personal Digital Assistants (PDAs), and wireless sensor devices, to name a few.

II. Device & Software to Self-Monitor Power of Power-Up Phase

In one embodiment, software is embedded in a mobile device to self-monitor the period of the power-up phase, P_u for the device, and to self-adjust the value of P_u if P_u is inconsistent with maximally conserving the battery power of the mobile

device. Fig. 1 shows such a GPS-equipped mobile device 100. The GPS- equipped mobile device may be, for example, a Compaq ® iPAQ ® PDA with a GPS adaptor connected to the PDA. Software embodying a method to self-monitor the period of the power-up phase is used in the PDA to implement this embodiment.

The embodiments of the invention involve the determination of the error between the predicted position of the mobile device and that of the actual position reported by its GPS. Given a past history of N reported positions, prediction techniques can be used to predict the position of the device at some time t later (the next power-up phase). The value N is determined *a priori*, usually based on experience of testing of a particular adaptive learning algorithm. In an embodiment of the invention, an adaptive filter technique based on neural networks is used for the position prediction. The difference between this predicted position and the actual position measured at time t can be used to formulate the position error. After forming this position error, the values of the position, the position error, and the value of P_u used at the time of the actual position measurement are stored in the mobile device's memory. In addition, acquisition time dt_a may be stored.

Fig. 2 is a block diagram of the system 200 that may be implemented using the PDA of Fig. 1. The system 200 comprises a neural network module 230 that receives various inputs 210-220 to produce a predicted period of the power-up phase P_u 240. The neural network module 230 predicts the next time to power on the GPS device. This module 230 does so dependent upon various inputs including the last satellite positions 210, the last GPS position/time 212, the last GPS error 214, the current power-up time 216, information about whether or not the last target (i.e. were the accuracy requirements satisfied or not) was achieved, and the current radio position and error 220. The latter information 220 may be determined using Cramer-Rao bounds. Further details of the neural network 200 are set forth hereinafter.

A flow chart of a method 300 to determine and store P_u, dt_u, and e_p is depicted in Fig. 3. Processing commences in step 310 in which the last N positions reported are used to predict the next position at the next scheduled power-up time. That is, given the past position history stored in the mobile device, an adaptive algorithm predicts the next position value. A number of techniques are known for predicting the

next position of a mobile device based on its past history of positions, such as regression, Kalman filter, particle filter. In step 320, at the next power-up time, the predicted position of the GPS-enabled mobile device is compared with the actual position of the mobile device, and the position error e_p is determined. Thus, given a predicted value of the position, the predicted value is checked against the actual position location reported the next time the GPS device is powered on to form the prediction error e_p. In step 330, the current values of the period of the power-up phase P_u, acquisition time dt_a, and prediction error e_p are stored. This information may be stored in the memory of the wireless device or other suitable storage device. Processing then terminates. The mobile device itself can time how long it took (from the onset of power up) to obtain a GPS fix - this is the acquisition time. If GPS position is unavailable at a particular epoch, nothing is recorded.

The foregoing method uses the stored position error values e_p to determine how best to set the value of P_u given an acceptable error bound a_c. A system can thus be designed that adaptively determines the best functional fit to the function $P_u(e_p)$. In one embodiment, a technique based on neural networks 200 can be used for the determination of $P_u(e_p)$. Given the current best estimate of this function and the acceptable error bound a_c, the value of P_u can be then set using $P_u(a_c)$. In addition, a weighted contribution of $P_u(a_c)$ can be allowed for to be used in setting the new power-up period. A separate algorithm checks whether the current power-up period is too large or too small, and if so adjusts P_u accordingly. The new power-up period can then be set as $wP_u + P_u(a_c)$, where w is a weighting factor in the range 0-1.

Fig. 4 is a flow diagram of a method 400 for adjusting the value of P_u and setting a new power-up period to deliver SM-GPS to mobile devices. Following on from steps described in Fig. 3, the method 400 commences in step 410. In step 410, the stored position error value e_p, determined from the last position fix, is read. In decision step 412, a check is made to determine if the stored position error value e_p is too large. In one embodiment, the term "too large" means that e_p is larger than a_c.

Variations on this in terms some fraction or multiple of a_c can also be used. If decision step 412 returns true (Yes), processing continues at step 414. In step 414, the current values of the period of the power-up phase P_u is adjusted down. In one embodiment, the new value may be adjusted to cP_u, where c is set at 0.5. Again, different values of c or different reduction algorithms may be practiced. The new power-up period has a minimum threshold value below which the power-up period cannot be set. This threshold value may be one second - which is the period set in the default TricklePower mode of many GPS chipsets. However, other threshold values may be specified. Processing continues from step 414 at step 422. Otherwise, if decision step 412 returns false (No), processing continues at step 416.

In decision step 416, a check is made to determine if the stored position error values e_p is too small. In one embodiment, the term "too small" means e_p is smaller than $0.5a_c$. However, variations on this in terms of some other fraction of a_c can also be used. If decision step 416 returns true (Yes), processing continues at step 418. In step 418, the current value of the power-up period P_u is adjusted upwards. That is, the value of P_u is increased to a new value. The new value may be calculated as bP_u, where b is set at 1.5. Once again, different values of b or different increase algorithms may be practiced. The new power-up period has a maximum threshold value below which it cannot be set. This threshold value may be ten minutes, for example, but this can be set by the user *a priori*. From step 418, processing continues at step 422. If decision step 416 returns false (No), processing continues at step 420.

In step 420, the current value of the power-up period P_u is not changed, that is, it is maintained at the same value. Processing then continues at step 422. In step 422, the new power-up period is set to $wP_u + (1-w)P_u(a_c)$. In step 424, a neural network estimate of $P_u(e_p)$ is provided to step 422. That is, separate from the above steps, a neural network 200 estimate of the function $P_u(e_p)$ is made based on the stored values of P_u and e_p. A weighted average of these two independent values may be used to set the final new power-up period as $wP_u + (1-w)P_u(a_c)$, where a_c is again the acceptable error bound on the position. The value of weighting parameter w is set

a priori by the manufacturer or user. In a variant of this process, w can be made time dependent. From step 422, processing terminates.

If position accuracy is the sole criteria dictating the value of P_u, the above process would suffice. However, if the acquisition time is the sole criteria dictating the value of P_u, the process 500 depicted in the flowchart described in Fig. 5 would suffice. This process 500 is similar to that 400 given above, except that the acquisition time dt_p is used to determine the new power-up period. It is the comparison of dt_p with the pre-assigned value for the bound on acquisition time that is used in decision making process. In step 510, the stored acquisition time dt_p is used to determine the last position fix. In decision step 512, a check is made to determine if the stored acquisition time dt_p is too large. In Fig. 5, a_c is now the acceptable error on acquisition time. The term "too large" means that dt_a is larger than a_c. Variations on this in terms of some fraction or multiple of a_c can also be used. If decision step 512 returns true (Yes), processing continues at step 514. In step 514, the current values of P_u is adjusted down. Thus, if dt_a is too large, the value of P_u is reduced to a new value. The new value may be set to cP_u, where c is set at 0.5. Different values of c or different reduction algorithms may be used. Again, a minimum value of the power-up period is imposed. Processing continues from step 514 at step 522. Otherwise, if decision step 512 returns false (No), processing continues at step 516.

In decision step 516, a check is made to determine if the stored acquisition time dt_p is too small. The term "too small" means that dt_a is smaller than $0.5\,a_c$. Variations on this in terms of some other fraction of a_c can also be used. If decision step 516 returns true (Yes); processing continues at step 518. In step 518, the current value of P_u is adjusted upwards. Thus, if dt_a is too small, the value of P_u is increased to a new value. The new value of the power-up period may be set to bP_u, where b is set at 1.5. Different values of b or different increase algorithms may be used. Again a maximum value of the power-up period is imposed. From step 518, processing

continues at step 522. If decision step 516 returns false (No), processing continues at step 520.

In step 520, the current value of the power-up period P_u is not changed, that is, it is maintained at the same value. Processing then continues at step 522. In step 522, the new power-up period is set to $wP_u + (1-w)P_u(a_c)$. In step 524, a neural network estimate of $P_u(dt_p)$ is provided to step 522. A weighted average of these two independent values is then used to set the final new power-up period as $wP_u + (1-w)P_u(a_c)$, where a_c is again the acceptable error bound on the acquisition time. The value of w is set *a priori* by the manufacturer or user. In a variant of this process w can be made time dependent. That is, separate from the above steps, a neural network 200 estimate of the function $P_u(dt_p)$ is made based on the stored values of P_u and dt_p. From step 522, processing terminates.

In the event that both the position accuracy and the acquisition time are to be considered in dictating the new value of the power-up period, both algorithms shown in Figs. 4 and 5 may be run simultaneously and independently. The smaller of the two new values of the power-up period reported by the algorithms may be utilized as the final new value.

As used by an E-911 application, the mobile device can automatically power-up the GPS device and determine its current position, if the GPS is available at that particular time. Due the SM-GPS algorithm described hereinbefore, cold start of the GPS device should be avoided. If for some reason the GPS is unavailable (*e.g.* by non-line of sight effects) when an emergency position request is made, the mobile device can report the GPS position predicted at the last power-up phase. This has the advantage over A-GPS that no added network infrastructure is required, and an estimate of the mobile device's current position is given even if the GPS suddenly became unavailable.

In the context of continuous position requests, such as in a tracking application, the SM-GPS algorithm adaptively alters the power-up period to find the largest value of P_u at that particular epoch that is consistent with the required accuracy and acquisition time bounds. This has an advantage relative to current

systems that the user of the device does not have to estimate and manually enter such a value *a priori*. This also has the advantage of self-adjusting the value of P_u to changing conditions.

III. Neural Networks

The adaptive prediction algorithm used for predicting positions and within the SM-GPS is similar to a Time Delay Neural Network (TDNN). Such networks are neural networks that have a special topology used for position-independent recognition of features within a larger pattern. These types of networks have been successfully used in applications such as speech prediction algorithms and stock predictions. Flexibility in the architectural design of these networks allows them to handle any complex nonlinear behavior as well as more simple linear behavior. A TDNN with just one neuron and a linear transfer function can be trained to operate as an effective linear adaptive filter.

The details of TDNNs, how they operate and the different architectures possible (*e.g.* learning strategies, transfer functions, number of layers, weights) have been well documented in the literature. For example, see Simon Haykin, *Neural Networks: A comprehensive foundation*, MacMillan, New York, 1994. In one embodiment, the previous positions are used to form the input vectors of the neural network and the output is the predicted position.

Other neural network are constructed to optimally find the functions $P_u(e_p)$ and $P_u(dt_a)$ in Figs. 4 and 5, respectively. These are referred to as "function discovery" neural networks. Again these networks are adaptive, in the sense that the functional forms $P_u(e_p)$ and $P_u(dt_a)$ do not remain constant in time.

To accommodate various forms of relationships between the input vectors and the output in a neural network, Multi-Layer Perceptron (MLP) models are used. These types of models can be applied to both the TDNN networks and the function discovery neural networks. MLP models typically have an input vector of length r and a hidden layer of s neurons. A matrix of weights $\alpha_{s,r}$ describes the relationship between the input vectors and the layer of neurons. Various transfer function can be

deployed such as a log-sigmiod transfer function. In general, the number of hidden layers can be increased to accommodate even more complex systems. In one embodiment, an MLP network that is adopted involves one hidden layer and a number of neurons equal to the size of the input vector. A log-sigmoid transfer function is adopted. For TDNN, the weights associated with the neural network adapt to the newly predicted position and its subsequent measurement of the actual position to minimize future prediction errors. By this mechanism, the network adapts and "learns" the optimal weight $\alpha_{s,r}$ settings relevant to that particular epoch.

For the function discovery neural networks, the weights associated with the neural networks adapt to the newly predicted functional form of the functions ($P_u(e_p)$ and $P_u(dt_a)$ of Figs. 4 and 5, respectively, based on the incoming new data. This means that the neural networks are constantly re-training themselves.

IV. Other Embodiments & Variations

The adaptive learning algorithms can be embedded on a signal processing chip in a mobile device. For additional power savings, the neural network calculations may be passed to some external processing unit within the network, if the mobile device is in communication with a larger network, e.g. a wireless network. The value of the power-up period calculated by the external device may then be passed back to the mobile device.

In the event of a GPS signal being unavailable, the position error and acquisition time are not defined for that time. As this could be an indication that the user is in an area where reception of the GPS satellite signals is poor, one may wish not to decrease the power-up period, or at least to limit the decrease. In this way additional energy sources are not used in a vain attempt at acquiring a GPS signal.

There are many neural network architectures that could be deployed in the algorithms of Figs. 2, 4 and 5. For example, the predicted position can also be a function of the actual P_u being used (in general shorter values of P_u have smaller errors). A neural network can be invoked in which the past history of P_u is also an input to the neural network. Radial basis function networks could also be deployed in

the estimates of the functions $P_u(e_p)$ and $P_u(dt_a)$. A thorough discussion of neural network architectures can be found in standard texts. Again, see for example Simon Haykin, *Neural Networks: A comprehensive foundation*, MacMillan, New York, 1994.

VI. Other Embodiments & Variations

The methods according to the embodiments of the invention may be practiced using one or more general-purpose computer systems, handheld devices, cellular phone, and other suitable mobile computing devices, in which the processes described with reference to Figs. 1-5 may be implemented as software, such as an application program executing within the computer system or a handheld device. In particular, instructions in the software that are carried out by the computer effect the steps in the method, at least in part. Software may include one or more computer programs, including application programs, an operating system, procedures, rules, data structures, and data. The instructions may be formed as one or more code modules, each for performing one or more particular tasks. The software may be stored in a computer readable medium, comprising one or more of the storage devices described below, for example. The computer system loads the software from the computer readable medium and then executes the software. Fig. 6 depicts an example of a computer system 600 with which the embodiments of the invention may be practiced. A computer readable medium having such software recorded on the medium is a computer program product. The use of the computer program product in the computer system may effect an advantageous apparatus in accordance with the embodiments of the invention.

Fig. 6 illustrates the computer system 600 in block diagram form, coupled to a wireless network 620. An operator may use the keyboard 630 and/or a pointing device such as the mouse 632 (or touchpad, for example) to provide input to the computer 650. The computer system 600 may have any of a number of output devices, including line printers, laser printers, plotters, and other reproduction devices connected to the computer. The computer system 600 can be connected to one or more other computers via a communication interface 664 using an appropriate

communication channel 640. The computer network 620 may comprise a wireless local area network (WLAN), or a 3G network, for example. While not depicted in Fig. 6 to simplify the drawing, it will be readily appreciated by those skilled in the art that the computer system 600 may be equipped with a GPS module, for example, in the manner shown in Fig. 1.

The computer 650 may comprise a processing unit 666 (e.g., one or more central processing units) 666, memory 670 which may comprise random access memory (RAM), read-only memory (ROM), or a combination of the two, input/output (IO) interfaces672, a graphics interface 660, and one or more storage devices 662. The storage device(s) 662 may comprise one or more of the following: a floppy disc, a hard disc drive, a magneto-optical disc drive, CD-ROM, DVD, a data card or memory stick, flash RAM device, magnetic tape or any other of a number of non-volatile storage devices well known to those skilled in the art. While the storage device is shown directly connected to the bus in Fig. 6, such a storage device may be connected through any suitable interface, such as a parallel port, serial port, USB interface, a Firewire interface, a wireless interface, a PCMCIA slot, or the like. For the purposes of this description, a storage unit may comprise one or more of the memory 670 and the storage devices 662 (as indicated by a dashed box surrounding these elements in Fig. 6).

Each of the components of the computer 650 is typically connected to one or more of the other devices via one or more buses 680, depicted generally in Fig. 6, that in turn comprise data, address, and control buses. While a single bus 680 is depicted in Fig. 6, it will be well understood by those skilled in the art that a computer or other electronic computing device, such as a PDA, may have several buses including one or more of a processor bus, a memory bus, a graphics card bus, and a peripheral bus. Suitable bridges may be utilized to interface communications between such buses. While a system using a CPU has been described, it will be appreciated by those skilled in the art that other processing units capable of processing data and carrying out operations may be used instead without departing from the scope and spirit of the invention.

The computer system 600 is simply provided for illustrative purposes, and other configurations can be employed without departing from the scope and spirit of the invention. Computers with which the embodiment can be practiced comprise IBM-PC/ATs or compatibles, laptop/notebook computers, one of the Macintosh (TM) family of PCs, Sun Sparcstation (TM), a PDA, a workstation or the like. The foregoing are merely examples of the types of devices with which the embodiments of the invention may be practiced. Typically, the processes of the embodiments, described hereinafter, are resident as software or a program recorded on a hard disk drive as the computer readable medium, and read and controlled using the processor. Intermediate storage of the program and intermediate data and any data fetched from the network may be accomplished using the semiconductor memory.

In some instances, the program may be supplied encoded on a CD-ROM or a floppy disk, or alternatively could be read from a network via a modem device connected to the computer, for example. Still further, the software can also be loaded into the computer system from other computer readable medium comprising magnetic tape, a ROM or integrated circuit, a magneto-optical disk, a radio or infra-red transmission channel between the computer and another device, a computer readable card such as a PCMCIA card, and the Internet and Intranets comprising email transmissions and information recorded on websites and the like. The foregoing is merely an example of relevant computer readable mediums. Other computer readable mediums may be practiced without departing from the scope and spirit of the invention.

A small number of embodiments of the invention regarding methods, systems, and computer program products for energy efficient GPS acquisition on a mobile device have been described. In the light of the foregoing, it will be apparent to those skilled in the art in the light of this disclosure that various modifications and/or substitutions may be made without departing from the scope and spirit of the invention.

CLAIMS

The claims defining the invention are as follows:-

1. A method of acquiring GPS on a mobile device possessing GPS capability, said method comprising the step of:

setting a current value of the period of the power-up phase of said GPS dependent upon adaptive predictions of when said GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

2. The method according to claim 1, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable bounds.

3. The method according to claim 1, wherein said mobile device determines dynamically an optimal period of the power-up phase.

4. The method according to claim 1, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

5. The method according to claim 4, wherein said adaptive-filter and machine learning techniques are implemented using said mobile device.

6. The method according to claim 1, wherein said setting step comprises:

if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

if at least one of predicted accuracy error and predicted acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

7. The method according to claim 1, wherein said mobile device comprises a power limited device.

8. The method according to claim 1, wherein said mobile device comprises an embedded GPS device.

9. The method according to claim 1, comprising the step of making adaptive predictions using a neural network.

10. The method according to claim 1, wherein said setting step comprises:

predicting a next position a next scheduled power-up time using a number of last positions reported;

comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

storing current values of period of the power-up phase, acquisition time, position error and position in a storage unit of said mobile device.

11. A mobile device, comprising:

a processor and memory coupled to said processor;

a GPS module coupled to said processor providing a GPS capability for said mobile device; and

means for setting a current value of the period of the power-up phase of said GPS module dependent upon adaptive predictions of when said GPS module should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

12. The mobile device according to claim 11, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable bounds.

13. The mobile device according to claim 11, wherein said mobile device determines dynamically an optimal period of the power-up phase.

14. The mobile device according to claim 11, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

15. The mobile device according to claim 14, wherein said adaptive-filter and machine –learning techniques are implemented using said mobile device.

16. The mobile device according to claim 11, wherein said setting means comprises:

means for, if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

means for, if at least one of predicted accuracy error and predicted acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

17. The mobile device according to claim 11, wherein said mobile device comprises a power limited device.

18. The mobile device according to claim 17, wherein said mobile device comprises a battery for powering said mobile device.

19. The mobile device according to claim 11, comprising a neural network module for making adaptive predictions.

20. The mobile device according to claim 11, wherein said setting means comprises:

means for predicting a next position a next scheduled power-up time using a

number of last positions reported;

means for comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

means for storing current values of a period of the power-up phase, acquisition time, position error and position in a storage unit of said mobile device.

21. A computer program product for a mobile device possessing GPS capability, said computer program product having a computer readable medium storing a computer program for acquiring GPS on said mobile device, comprising:

computer program code means for interfacing with the GPS capability of said mobile device; and

computer program code means for setting a current value of a period of the power-up phase of said GPS module dependent upon adaptive predictions of when said GPS module should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

22. The computer program product according to claim 21, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable bounds.

23. The computer program product according to claim 21, wherein said computer program product determines dynamically an optimal period of the power-up phase.

24. The computer program product according to claim 21, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

25. The computer program product according to claim 24, wherein said adaptive-filter and machine learning techniques are implemented using said mobile device

26. The computer program product according to claim 21, wherein said computer program code means for setting comprises:

computer program code means for, if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

computer program code means for, if at least one of predicted accuracy error and predicted acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

27. The computer program product according to claim 21, wherein said mobile device comprises a power limited device.

28. The computer program product according to claim 27, wherein said mobile device comprises a battery for powering said mobile device.

29. The computer program product according to claim 21, comprising computer program code means for providing a neural network module to make adaptive predictions.

30. The computer program product according to claim 21, wherein said computer program code means for setting comprises:

computer program code means for predicting a next position a next scheduled power-up time using a number of last positions reported;

computer program code means for comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

computer program code means for storing current values of a period of the power-up phase, acquisition time, position error and position in a storage unit of said mobile device.

31. A method of acquiring GPS on a mobile device possessing GPS capability, said method comprising the steps of:

using a position error between a predicted position and an actual position of said mobile device at a last position fix;

if the position error is too large, adjusting a current value of the period of the power-up phase downward;

if the position error is too small, adjusting the current value of said period of the power-up phase upward;

estimating using a neural network a new value of said period of the power-up phase dependent upon said position error; and

setting a new value of said period of the power-up phase to a weighted value dependent upon an acceptable error bound.

32. A method of acquiring GPS on a mobile device possessing GPS capability, said method comprising the steps of:

using an acquisition time at a last position fix;

if the acquisition time is too large, adjusting a current value of the period of the power-up phase downward;

if the acquisition time is too small, adjusting the current value of said period of the power-up phase upward;

estimating using a neural network a new value of said period of the power-up phase dependent upon said acquisition time; and

setting a new value of said period of the power-up phase to a weighted value dependent upon an acceptable bound.

33. A method of acquiring GPS on a mobile device possessing GPS capability, said method being substantially as hereinbefore disclosed with reference to any one of the embodiments shown in Figs. 1 to 6 of the accompanying drawings.

34. A mobile device, said mobile device being substantially as hereinbefore disclosed with reference to any one of the embodiments shown in Figs. 1 to 6 of the accompanying drawings.

35. A computer program product for a mobile device possessing GPS capability, said computer program product being substantially as hereinbefore disclosed with reference to any one of the embodiments shown in Figs. 1 to 6 of the accompanying drawings.

36. A method of acquiring GPS on a mobile device possessing GPS capability, said method being substantially as hereinbefore disclosed with reference to any one of the embodiments shown in Figs. 1 to 6 of the accompanying drawings.

AMENDED CLAIMS
[received by the International Bureau on 14 November 2005 (14.11.05); original claims 1-36 replaced by amended claims 1-36 (7 pages)]

CLAIMS

The claims defining the invention are as follows:-

1. A method of acquiring GPS on a mobile device possessing GPS capability, said method comprising the step of:

setting a current value of the period of the power-up phase of said GPS dependent upon Cramer-Rao Bound information on the independent wireless radio position, and adaptive predictions of when said GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time, when said specifications are statistical bounds.

2. The method according to claim 1, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable statistical bounds.

3. The method according to claim 1, wherein said mobile device determines dynamically an optimal period of the power-up phase.

4. The method according to claim 1, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

5. The method according to claim 4, wherein said adaptive-filter and machine learning techniques are implemented using said mobile device.

6. The method according to claim 1, wherein said setting step comprises:

if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

if at least one of predicted accuracy error and predicted acquisition times of

GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

7. The method according to claim 1, wherein said mobile device comprises a power limited device.

8. The method according to claim 1, wherein said mobile device comprises an embedded GPS device.

9. The method according to claim 1, comprising the step of making adaptive predictions using a neural network.

10. The method according to claim 1, wherein said setting step comprises:

predicting a next position a next scheduled power-up time using a number of last positions reported;

comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

storing current values of period of the power-up phase, acquisition time, position error and position in a storage unit of said mobile device.

11. A mobile device, comprising:

a processor and memory coupled to said processor;

a GPS module coupled to said processor providing a GPS capability for said mobile device; and

means for setting a current value of the period of the power-up phase of said GPS module dependent upon Cramer-Rao Bound information on the independent wireless radio position, and adaptive predictions of when said GPS module should be powered on to meet specifications on positioning accuracy and GPS acquisition time, when said specifications are statistical bounds.

12. The mobile device according to claim 11, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable bounds.

13. The mobile device according to claim 11, wherein said mobile device determines dynamically an optimal period of the power-up phase.

14. The mobile device according to claim 11, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

15. The mobile device according to claim 14, wherein said adaptive-filter and machine –learning techniques are implemented using said mobile device.

16. The mobile device according to claim 11, wherein said setting means comprises:

means for, if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

means for, if at least one of predicted accuracy error and predicted acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

17. The mobile device according to claim 11, wherein said mobile device comprises a power limited device.

18. The mobile device according to claim 17, wherein said mobile device comprises a battery for powering said mobile device.

19. The mobile device according to claim 11, comprising a neural network module for making adaptive predictions.

20. The mobile device according to claim 11, wherein said setting means comprises:

means for predicting a next position a next scheduled power-up time using a number of last positions reported;

means for comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

means for storing current values of a period of the power-up phase, acquisition time, position error and position in a storage unit of said mobile device.

21. A computer program product for a mobile device possessing GPS capability, said computer program product having a computer readable medium storing a computer program for acquiring GPS on said mobile device, comprising:

computer program code means for interfacing with the GPS capability of said mobile device; and

computer program code means for setting a current value of a period of the power-up phase of said GPS module dependent upon Cramer-Rao Bound information on the independent wireless radio position, and adaptive predictions of when said GPS module should be powered on to meet specifications on positioning accuracy and GPS acquisition time, when said specifications are statistical bounds.

22. The computer program product according to claim 21, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable bounds.

23. The computer program product according to claim 21, wherein said computer program product determines dynamically an optimal period of the power-up phase.

24. The computer program product according to claim 21, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

25. The computer program product according to claim 24, wherein said adaptive-filter and machine learning techniques are implemented using said mobile device

26. The computer program product according to claim 21, wherein said computer program code means for setting comprises:

computer program code means for, if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

computer program code means for, if at least one of predicted accuracy error and predicted acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

27. The computer program product according to claim 21, wherein said mobile device comprises a power limited device.

28. The computer program product according to claim 27, wherein said mobile device comprises a battery for powering said mobile device.

29. The computer program product according to claim 21, comprising computer program code means for providing a neural network module to make adaptive predictions.

30. The computer program product according to claim 21, wherein said computer program code means for setting comprises:

computer program code means for predicting a next position a next scheduled power-up time using a number of last positions reported;

computer program code means for comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

computer program code means for storing current values of a period of the power-up phase, acquisition time, position error and position in a storage unit of said mobile device.

31. A method of acquiring GPS on a mobile device possessing GPS capability, said method comprising the steps of:

using a position error between a predicted position and an actual position of said mobile device at a last position fix;

if the position error is too large, adjusting a current value of the period of the power-up phase downward;

if the position error is too small, adjusting the current value of said period of the power-up phase upward;

estimating using a neural network a new value of said period of the power-up phase dependent upon said position error; and

setting a new value of said period of the power-up phase to a weighted value dependent upon an acceptable error bound.

32. A method of acquiring GPS on a mobile device possessing GPS capability, said method comprising the steps of:

using an acquisition time at a last position fix;

if the acquisition time is too large, adjusting a current value of the period of the power-up phase downward;

if the acquisition time is too small, adjusting the current value of said period of the power-up phase upward;

estimating using a neural network a new value of said period of the power-up phase dependent upon said acquisition time; and

setting a new value of said period of the power-up phase to a weighted value dependent upon an acceptable bound.

33. A method of acquiring GPS on a mobile device possessing GPS capability, said method being substantially as hereinbefore disclosed with reference to any one of the embodiments shown in Figs. 1 to 6 of the accompanying drawings.

34. A mobile device, said mobile device being substantially as hereinbefore disclosed with reference to any one of the embodiments shown in Figs. 1 to 6 of the accompanying drawings.

35. A computer program product for a mobile device possessing GPS capability, said computer program product being substantially as hereinbefore disclosed with reference to any one of the embodiments shown in Figs. 1 to 6 of the accompanying drawings.

36. A method of acquiring GPS on a mobile device possessing GPS capability, said method being substantially as hereinbefore disclosed with reference to any one of the embodiments shown in Figs. 1 to 6 of the accompanying drawings.

This is a statement accompanying the amendments to the original claims of the PCT application PCT/AU2005/001351. Claims 1, 11 and 21 have been amended to include "Cramer-Rao Bound information on the independent wireless radio position" as this is a step in the disclosure (Fig 2). Claims 1, 11 and 21 have also been amended with the additional statement of "when said specifications are statistical bounds", as statistical bounds are different entities than non-statistical (deterministic) bounds. Statistical bounds are disclosed as those necessary for compliance with US Federal Communications Commission requirements for E-911 services. All other claims are based on claims 1, 11, and 21.

As disclosed in the application, the aim of the invention is to determine the *optimal* value of the power-up period. The invention is motivated by the desire to minimize GPS power usage whilst meeting stated requirements of E-911 services. These requirements are statistical not deterministic. The cited prior art does not disclose any method that will determine or predict the *optimal* power-up period required to meet statistical bound requirements, nor do they include optimal position information (that is the Cramer Rao Bounds on range or position) available from any independent wireless position system (say the wireless network the device is using for communications). Two examples can be used to illustrate the importance of Cramer-Rao Bounds, and the requirement of statistical bounds.

i) An optimal power-up period based on statistical bounds can be very different than the power-up period derived from deterministic bounds. If deterministic bounds are used, in one step of the process the power up-period could be set so as to satisfy a deterministic accuracy bound of say 50m. If this 50m bound is not met, prior art dictates that the power-up period be shortened to some undisclosed new value. It could well be the case, however, that even if the power-up period was not shortened, in the next step of the process the 50m accuracy was in fact achieved. This could happen with say 50% probability. If the accuracy bounds considered were a statistical bound stated as "50% of measurements must be within 50m," for example, the power-up period need not be adjusted. This would represent substantial power savings. The disclosed invention PCT/AU2005/001351 applies a neural network calculation with previous values of the power-up period as inputs, and statistical bounds as constrained outputs. It thus sets out a novel method to determine in an optimal fashion the specific value of the power-up period required to meet statistical bounds.

ii) In PCT/AU2005/001351 use of Cramer-Rao Bounds on independent (non-GPS) radio positions is considered as part of the inputs to the neural network calculation. Cramer-Rao Bounds on position, or ranges (from say a base station), represent optimal statistical bounds on the variance of metrics related to position information. If these variances show that the radio position error will meet statistical requirements, say less than 50m 50% of the time, then there will never be any requirement to power on GPS to meet said statistical requirements. The neural network will set the power-up period to an infinite value. This represents significant savings compared to methods disclosed in any prior art cited.

The amended claims attempt to distinguish the novelty and inventive steps disclosed in PCT/AU2005/001351. The use of machine learning algorithms, which use as inputs historical values of the power-up period and Cramer-Rao Bound information on radio positions, to determine an optimal value of a power-up period, is not disclosed in any prior art. In a wide range of circumstances, the power savings obtained from methods disclosed in the cited prior art, will be significantly less than the power savings obtained from the methods disclosed in PCT/AU2005/001351.

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

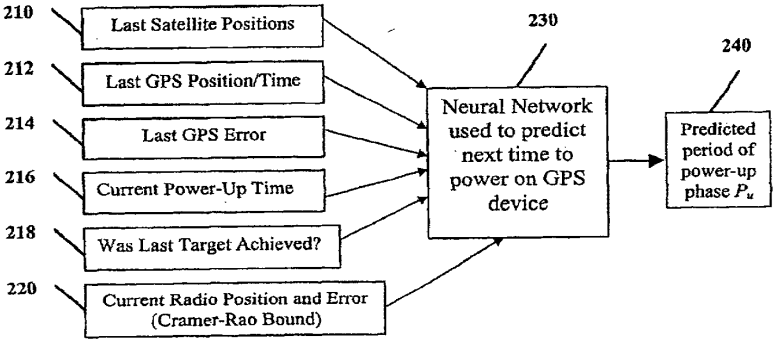
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- *of inventorship (Rule 4.17(iv)) for US only*

Published:
- *with international search report*
- *with amended claims and statement*

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

(54) Title: SELF MONITORING GPS ON MOBILE DEVICE



(57) Abstract: A method, a mobile device arid a computer program product for acquiring GPS on a mobile device possessing GPS capability are disclosed. The method comprises the step of setting a current value of the period of the power-up phase of the GPS dependent upon adaptive predictions of when the GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

WO 2006/024112 A1

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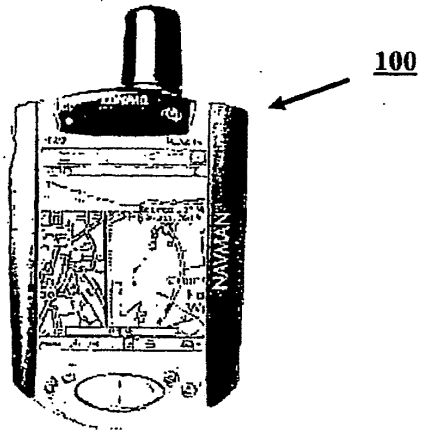


FIG. 1

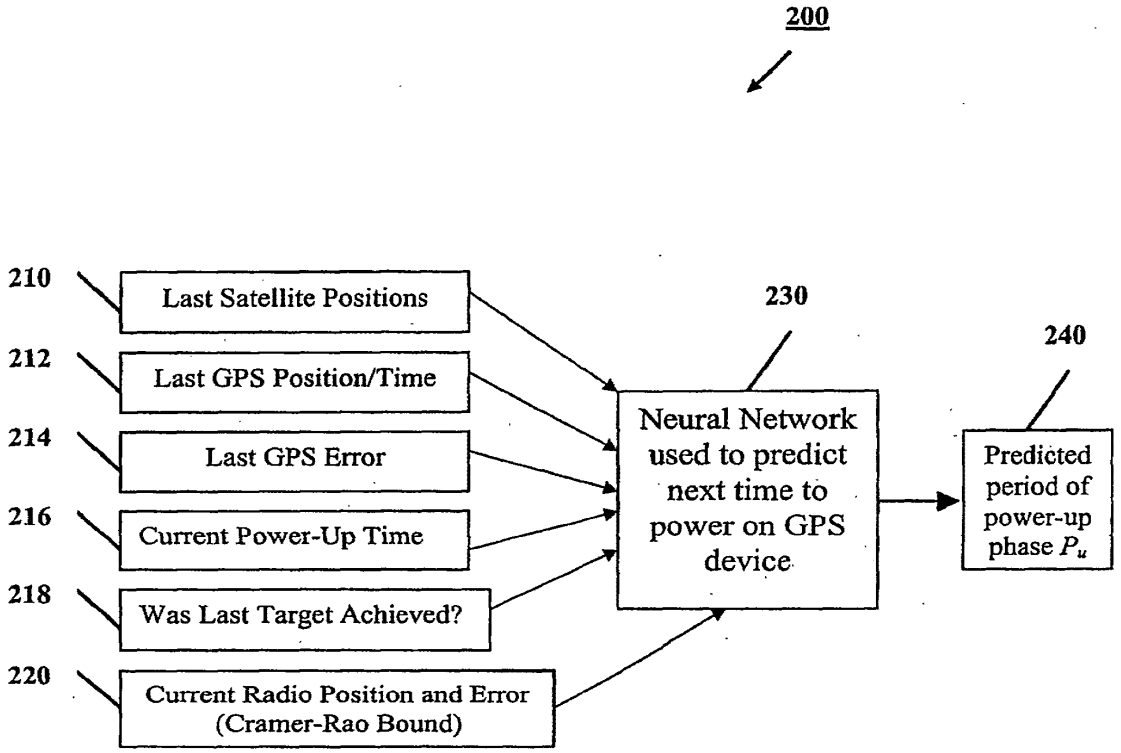

200
210
Last Satellite Positions
212
Last GPS Position/Time
214
Last GPS Error
216
Current Power-Up Time
218
Was Last Target Achieved?
220
Current Radio Position and Error (Cramer-Rao Bound)
230
Neural Network used to predict next time to power on GPS device
240
Predicted period of power-up phase P_u

FIG. 2

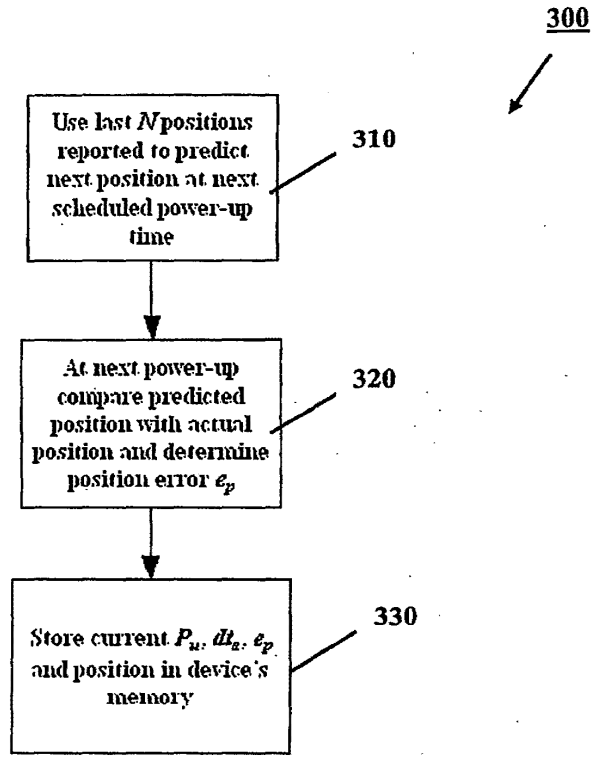

300
Use last N positions reported to predict next position at next scheduled power-up time
310
At next power-up compare predicted position with actual position and determine position error e_p
320
Store current P_u, dt_z, e_p and position in device's memory
330

FIG. 3

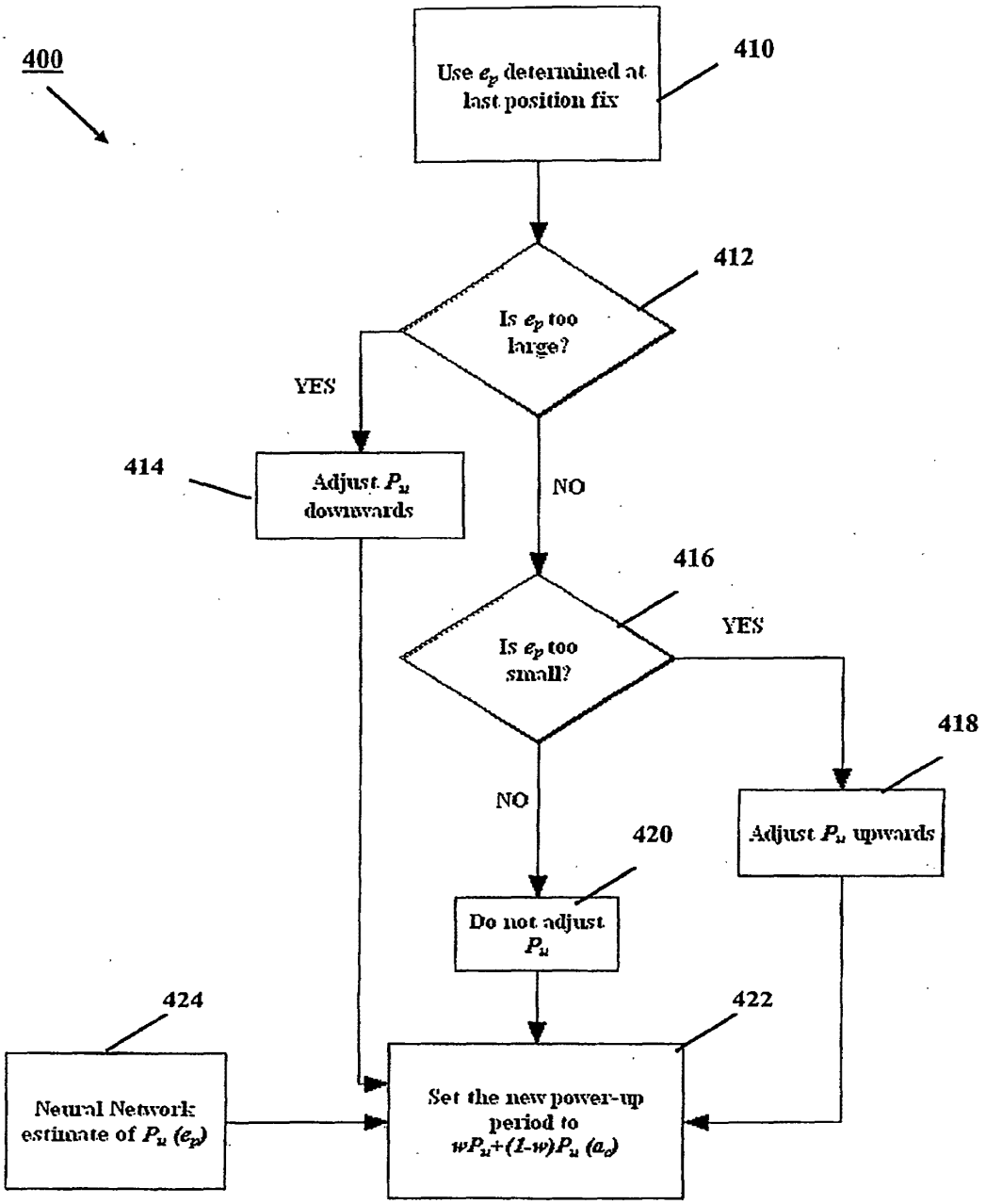

400
Use e_p determined at last position fix
410
Is e_p too large?
412
YES
NO
414
Adjust P_u downwards
Is e_p too small?
416
YES
NO
418
Adjust P_u upwards
420
Do not adjust P_u
424
Neural Network estimate of P_u (e_p)
422
Set the new power-up period to $wP_u+(1-w)P_u$ (a_p)

FIG. 4

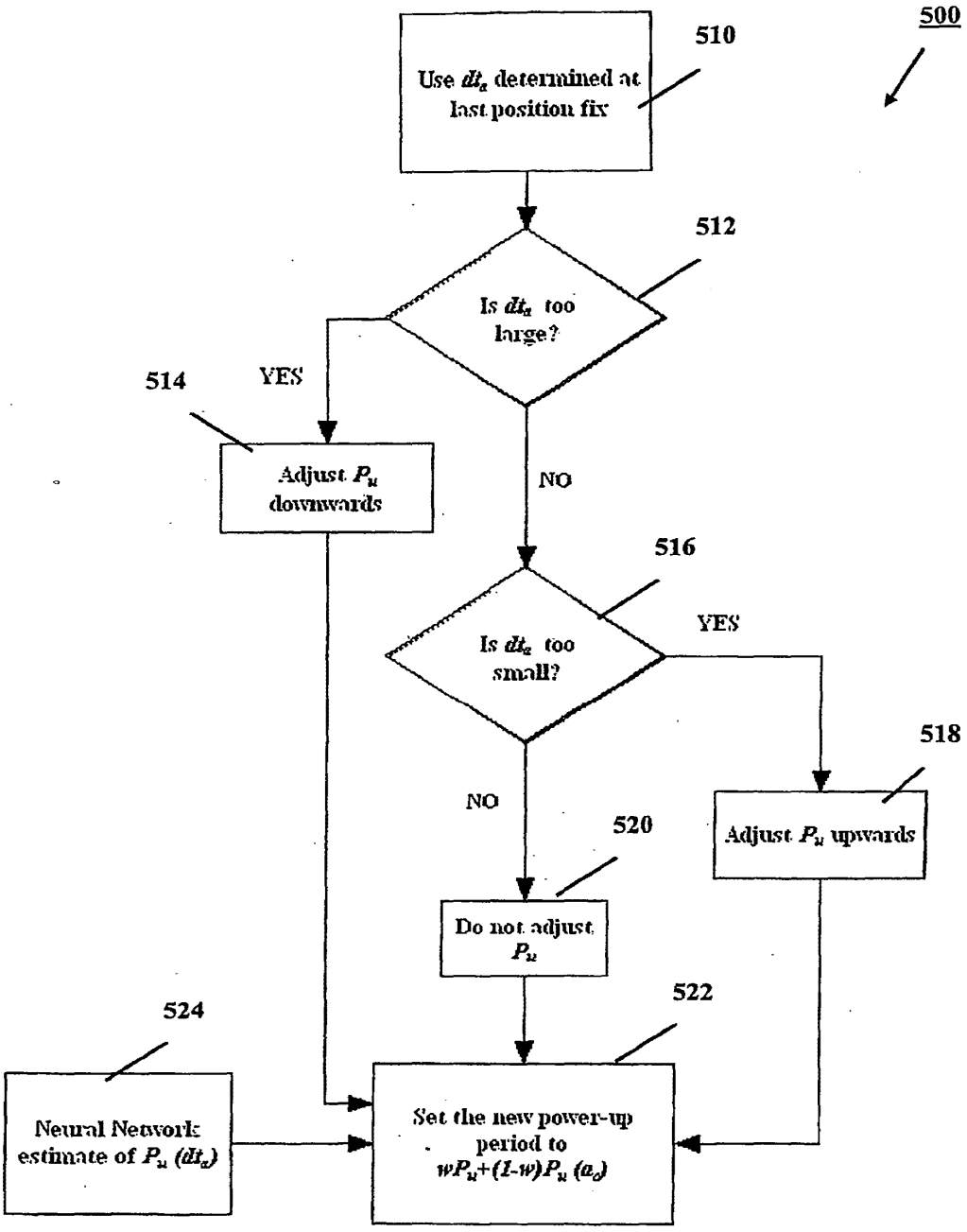

500
510
Use dt_u determined at last position fix
512
Is dt_u too large?
514
YES
Adjust P_u downwards
NO
516
Is dt_u too small?
YES
518
Adjust P_u upwards
NO
520
Do not adjust P_u
522
Set the new power-up period to $wP_u+(1-w)P_u$ (a_o)
524
Neural Network estimate of P_u (dt_u)

FIG. 5

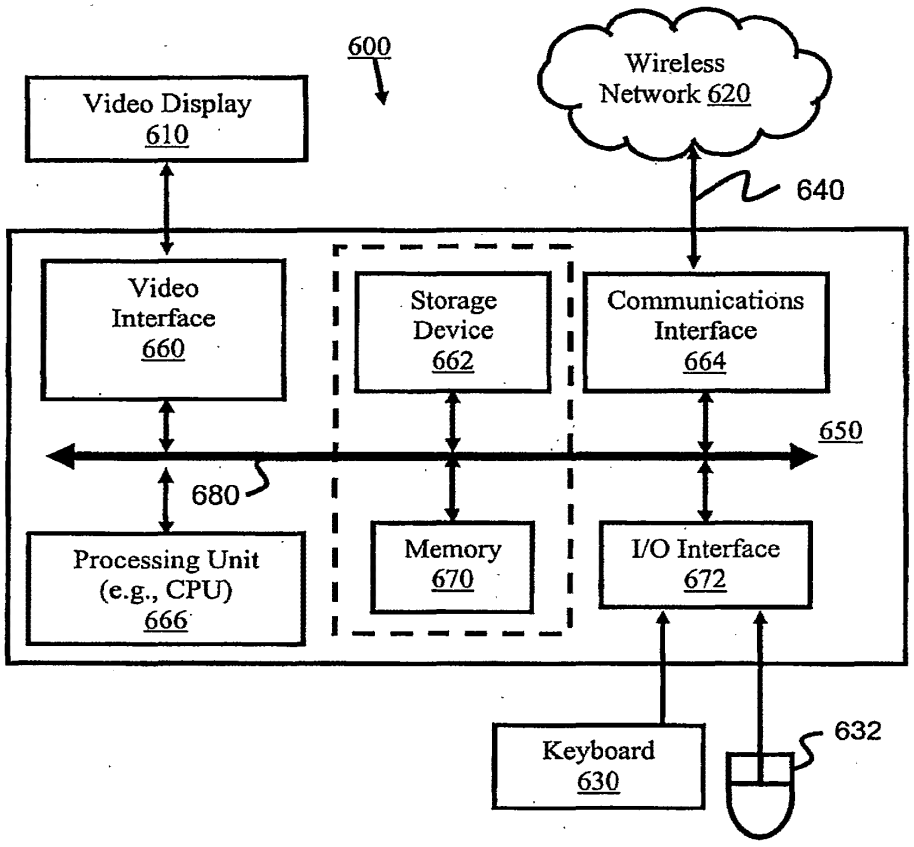

600
Wireless Network 620
Video Display 610
640
Video Interface 660
Storage Device 662
Communications Interface 664
650
680
Processing Unit (e.g., CPU) 666
Memory 670
I/O Interface 672
Keyboard 630
632

FIG. 6

PATENT APPLICATION SERIAL NO. _____

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FEE RECORD SHEET

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CHAPTER II

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PCT/AU2005/001351	31 AUGUST 2005	02 SEPTEMBER 2004

TITLE OF INVENTION
SELF MONITORING GPS ON MOBILE DEVICE

APPLICANT(S)
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Commissioner for Patents
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Respectfully submitted,

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NEW YORK, NEW YORK 10023
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11/661707

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	U 016731-5	
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	Robert Anderson MALANEY	
(Use several sheets if necessary)	FILING DATE	GROUP

IAP8 Rec'd PCT/PTO 01 MAR 2007

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	REFERENCE DESIGNATION	DOCUMENT NUMBER	DATE	NAME	FILING DATE IF APPROPRIATE
	AA	2003/0083814	05/2003	Gronemeyer	
	AB	2003/0107514	06/2003	Syrjarinne, et al.	
	AC	6,590,525	07/2003	Yule, et al.	
	AD				
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	AG				
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FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION	
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	AN					
	AO					
	AP					

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MALANEY, Robert, Anderson
16 Carlyle Street
East Lindfield, NSW 2070
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Date of mailing *(day/month/year)* 04 November 2005 (04.11.2005)	
Applicant's or agent's file reference	IMPORTANT NOTIFICATION
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International publication date *(day/month/year)*	Priority date *(day/month/year)* 02 September 2004 (02.09.2004)
Applicant MALANEY, Robert, Anderson	

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Priority date	Priority application No.	Country or regional Office or PCT receiving Office	Date of receipt of priority document
02 September 2004 (02.09.2004)	2004905024	AU	11 October 2005 (11.10.2005)

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PATENT COOPERATION TREATY PCT/AU2005/001351

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92*bis*.1 and Administrative Instructions, Section 422)

To:

SPRUSON & FERGUSON
GPO Box 3898
Sydney, NSW 2001
AUSTRALIE

Date of mailing *(day/month/year)*
07 July 2006 (07.07.2006)

Applicant's or agent's file reference

IMPORTANT NOTIFICATION

International application No.
PCT/AU2005/001351

International filing date *(day/month/year)*
31 August 2005 (31.08.2005)

1. The following indications appeared on record concerning:

☐ the applicant ☐ the inventor ☒ the agent ☐ the common representative

Name and Address

State of Nationality | State of Residence

Telephone No.

Facsimile No.

Teleprinter No.

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person ☒ the name ☒ the address ☐ the nationality ☐ the residence

Name and Address
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Australia

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Telephone No.
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Facsimile No.
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3. Further observations, if necessary:
NEW AGENT APPOINTED FOR THIS APPLICATION. NEW REFERENCE 672078C RECORDED.

4. A copy of this notification has been sent to:

☒ the receiving Office
☐ the International Searching Authority
☐ the International Preliminary Examining Authority
☒ the designated Offices concerned
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GPO Box 3898
Sydney, NSW 2001
AUSTRALIE

Date of mailing *(day/month/year)* 05 February 2007 (05.02.2007)	
Applicant's or agent's file reference 672078C	**IMPORTANT NOTIFICATION**
International application No. PCT/AU2005/001351	International filing date *(day/month/year)* 31 August 2005 (31.08.2005)

1. The following indications appeared on record concerning:

☒ the applicant ☐ the inventor ☐ the agent ☐ the common representative

Name and Address	State of Nationality	State of Residence
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☒ the person ☒ the name ☒ the address ☐ the nationality ☐ the residence

Name and Address	State of Nationality	State of Residence
NARISTE NETWORKS PTY LTD 16 Carlyle Road Lindfield, NSW 2070 Australia	AU	AU
	Telephone No.	
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3. Further observations, if necessary:
Please note the new applicant for all designated states except the US, the inventor remaining applicant for the purposes of the US only.

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CHAPTER II

DEMAND

under Article 31 of the Patent Cooperation Treaty:
the undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only

Identification of IPEA	Date of receipt of DEMAND

Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION		Applicant's or agent's file reference: 672078C
International application No.: PCT/AU2005/001351	International filing date *(day/month/year)*: 31 August 2005	(Earliest) Priority date *(day/month/year)*: 2 September 2004 (02/09/04)
Title of invention: Self monitoring GPS on mobile device		

Box No. II APPLICANT(S)

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*	Telephone No:
MALANEY, Robert Anderson 16 Carlyle Road East Lindfield, NSW 2070 Australia	Facsimile No:
	Applicant's registration No with the Office:

State *(i.e. country)* of nationality:	State *(i.e. country)* of residence
United Kingdom	Australia

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country)*

MALANEY, Robert Anderson
16 Carlyle Road
East Lindfield, NSW 2070
Australia

State *(i.e. country)* of nationality:	State *(i.e. country)* of residence:
United Kingdom	Australia

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country)*

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Sheet No. 2

International application No.
PCT/AU2005/001351

Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The following person is ☒ agent ☐ common representative

and ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.

☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.

☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

Spruson & Ferguson
GPO Box 3898
Sydney, New South Wales 2001
AUSTRALIA

Telephone No:
+61 2 9207 0777

Facsimile No:
+61 2 9261 5486

Agent's registration No with the Office:

☐ **Address for correspondence:** Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION

Statement concerning amendments:*

1. The applicant wishes the international preliminary examination to start on the basis of:

☐ the international application as originally filed

the description
- ☒ as originally filed
- ☐ as amended under Article 34

the claims
- ☐ as originally filed
- ☐ as amended under Article 19 (together with any accompanying statement)
- ☒ as amended under Article 34

the drawings
- ☒ as originally filed
- ☐ as amended under Article 34

2. ☒ The applicant wishes any amendment to claims under Article 19 to be considered as reversed

3. ☐ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of the applicable time limit under Rule 69.1(d).

4. ☐ The applicant expressly wishes the international preliminary examination to start earlier than at the expiration of the applicable time limit under Rule 54*bis*.1(a).

* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: English

☒ which is the language in which the international application was filed.

☐ which is the language of a translation furnished for the purposes of international search.

☐ which is the language of publication of the international application.

☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.

Box No. V ELECTION OF STATES

The filing of this demand constitutes the election of all Contracting States which are designated and are bound by Chapter II of the PCT.

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Sheet No. 3

International application No.
PCT/AU2005/001351

Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No IV, for the purposes of international preliminary examination:			For International Preliminary Examining Authority use only	
			Received	not received
1. translation of international application	:	0 sheets	☐	☐
2. amendments under Article 34	:	7 sheets	☐	☐
3. copy (or, where required, translation) of of amendments under Article 19	:	0 sheets	☐	☐
4. copy (or, where required, translation) of statement under Article 19	:	0 sheets	☐	☐
5. letter	:	3 sheets	☐	☐
6. other *(specify)*	:	10 sheets	☐	☐

The demand is also accompanied by the item(s) marked below:

1. ☒ fee calculation sheet
2. ☐ original separate power of attorney
3. ☐ original general power of attorney
4. ☒ copy of general power of attorney; reference number, if any:
5. ☐ statement explaining lack of signature
6. ☐ sequence listing in computer readable form
7. ☐ tables in computer readable form related to a sequence listing
8. ☐ other *(specify)*:

Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).

Scott Berggren
Registered Patent Attorney
SPRUSON & FERGUSON

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1. Date of actual receipt of DEMAND

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 and 5, below, does not apply.
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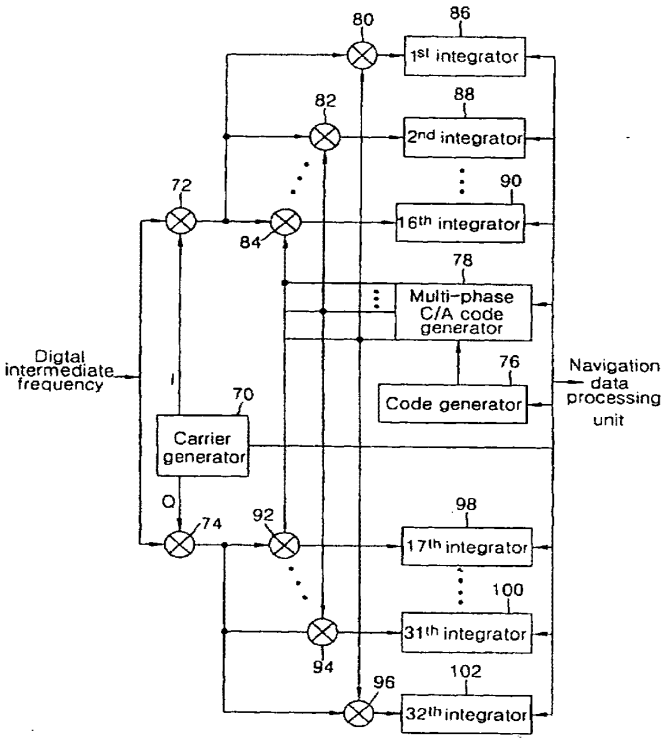
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[Continued on next page]

(54) Title: POWER MANAGING APPARATUS FOR RECEIVING OF GLOBAL POSITIONING SYSTEM



(57) Abstract: The present invention relates to a power managing apparatus for used in GPS receiver, capable of reducing power consumption. There is provided a power managing apparatus for preventing unnecessary power consumption of a GPS receiver by fast receiving signals from the satellites through estimating power break time. The power break time can be estimated by using a correction function for real time clock and simultaneous search of a plurality of code phase correspondent to GPS signal.

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(81) **Designated States** *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

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Published:
— *with international search report*

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POWER MANAGING APPARATUS FOR RECEIVING OF GLOBAL POSITIONING SYSTEM

Technical Field

The present invention relates to a power managing apparatus for a receiver of Global Positioning System (hereinafter 'GPS receiver'), and more particularly to a power managing apparatus being capable of reducing a power consumption of the GPS receiver.

Background Art

Fig. 1 is a block diagram of a conventional GPS receiver, wherein a digital signal processor (hereinafter 'DSP') unit 12, provided with digital signals of intermediate frequency from an intermediate frequency (hereinafter 'IF') unit 10, processes the digital signals for use in processing a navigation data and provides processed digital signals to a navigation data processing unit 18. The DSP unit 12 includes a correlator 14 and a real time clock (hereinafter 'RTC') unit 16.

The conventional GPS receiver will be described in detail with reference to Fig. 2.

Fig. 2 is a block diagram illustrating an example of

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the correlator 14 shown in Fig. 1. The correlator 14 comprises a carrier numerically controlled oscillator (hereinafter 'carrier NCO') 22, a first carrier mixer 24, a second carrier mixer 26, a code numerically controlled oscillator (hereinafter 'code NCO') 28, a C/A code generator 30, a first to a sixth code mixers 32, 34, 36, 44, 46, 48, and a first to a sixth integrators 38, 40, 42, 50, 52, 54.

In Fig. 1 and Fig. 2, the IF unit 10 converts radio frequency signals received from satellites into IF signals, and provides the IF signals for the correlator 14 in the DSP unit 12.

The carrier NCO 22 generates sinusoidal waves for use in eliminating carrier waves received from satellite signals. In detail, the frequency of carrier wave provided from the navigation data processing unit 18 is inputted. Then, sine signals (I) and cosine signals (Q) are generated and provided for the first carrier mixer 24 and the second carrier mixer 26, respectively.

The first carrier mixer 24 multiplies the sine signals (I) provided from the carrier NCO 24 by the digital signals of IF, and provides multiplied signals for the first, the second and the third code mixer 32, 34 and 36, respectively.

The code NCO 28 generates a reference frequency for use in generating a pseudo random noise (hereinafter 'PRN') code of GPS satellites, and provides the reference frequency for the C/A code generator 30.

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The C/A code generator 30 generates the PRN codes of the GPS satellites by using the reference frequency provided from the code generator 28. In detail, the C/A code generator generates an early code, a prompt code and a late code, and provides the early code, the prompt code and the late code for the first, the second and the third code mixers 32, 34 and 36, respectively.

The first code mixer 32 multiplies the early code received from the C/A code mixer 30 by output signals from the first carrier mixer 24, and provides multiplied signals to the first integrator 38. The first integrator 38 integrates an output of the first code mixer 32 during one period of a C/A code, i.e., 1 millisecond, and provides an integration result for the navigation data processing unit 18. The C/A code is the PRN code of the GPS satellite.

The second code mixer 34 multiplies the prompt code received from the C/A code mixer 30 by output signals from the first carrier mixer 24, and provides multiplied signals to the second integrator 40. The second integrator 40 integrates an output of the second code mixer 34 during one period of a C/A code, i.e., 1 millisecond, and provides an integration result for the navigation data processing unit 18.

The third code mixer 36 multiplies the late code received from the C/A code mixer 30 by output signals from the first carrier mixer 24, and provides multiplied signals

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to the third integrator 42. The third integrator 42 integrates an output of the third code mixer 36 during one period of a C/A code, i.e., 1 millisecond, and provides an integration result for the navigation data processing unit 18.

Similarly, each of the fourth, fifth and sixth code mixer 44, 46, 48 multiplies an early code, a prompt code and a late code received from the C/A code mixer 30 by output signals of the second carrier mixer 26, and provides multiplied signals to the fourth, the fifth and the sixth integrator 50, 52 and 54 respectively. Each of the fourth, the fifth and the sixth integrator integrates an output of the fourth, the fifth and the sixth code mixer 44, 46 and 48 during one period of a C/A code, i.e., 1 millisecond, and provides an integration result for the navigation data processing unit 18, respectively.

According to the above-described prior art, however, the GPS receiver continuously consumes power even after acquiring a required data, and thus, the GPS receiver exacts unnecessarily high power consumption.

Disclosure of Invention

An object of the present invention is to provide a power managing apparatus for the GPS receiver for preventing unnecessary power consumption of the GPS receiver by fast

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Google LLC et al v. Nariste Networks Pty. Ltd.

receiving signals from the satellites through estimating power break time being estimated by using a correction function for real time clock and simultaneous search of a plurality of code phases corresponding to GPS signal.

According to an aspect of the present invention, there is provided a power managing system for a GPS receiver comprising: an intermediate frequency generating means for generating a intermediate frequency by converting a radio frequency of signals received from a satellite to the intermediate frequency; a digital signal processing means for processing intermediate frequency signals provided by the intermediate frequency generating means to be used in a navigation data processes; a navigation data processing means for calculating satellite navigation data based on a processed digital signals from the digital signal processing means, estimating a power break time, and generating a power control signals capable of providing power to the intermediate frequency generating means and the digital signal processing means only when satellite data required for a calculation of the satellite navigation data is received; and a power supply means for controlling a power supply to the intermediate frequency generating means and the digital signal processing means on the basis of the power control signals provided from the navigation data processing means.

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Brief Description of Drawings

The above and other objects and features of the present invention will become apparent from the following description of a preferred embodiment given in conjunction with the accompanying drawings, in which:

Fig. 1 is a block diagram showing a conventional GPS receiver;

Fig. 2 is a block diagram illustrating an exemplary structure of a correlator in Fig. 1;

Fig. 3 is a block diagram showing an embodiment of a power managing apparatus for GPS receiver in accordance with the present invention;

Fig. 4 is a graph describing an algorithm used in the power managing apparatus for GPS receiver of Fig. 3;

Fig. 5 is a timing diagram describing a principle of an estimation of a power break time for use in the GPS receiver shown in Fig. 3;

Fig. 6 is a diagram showing an embodiment of a real time clock application unit illustrated in Fig. 3;

Fig. 7 and Fig. 8 are timing diagrams for describing an operation of the real time clock application unit shown in Fig. 6; and

Fig. 9 is a block diagram illustrating an embodiment of a correlator shown in Fig. 3.

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Best Mode for Carrying Out the Invention

Hereinafter, a preferred embodiment of the present invention will be described in detail with reference to the accompanying drawings.

Fig. 3 is a block diagram showing an embodiment of a power managing apparatus for GPS receiver in accordance with the present invention. In the power managing apparatus for GPS receiver in Fig. 3, a navigation data processing means 118 receives output signals received from a digital signal processing means 112 and calculates a satellite navigation data by using the output signals. In addition, the navigation data processing means 118 controls a power supply means 120 so that the power supply means 120 provides power to an intermediate frequency generating means 110 and the digital signal processing means 112 once satellite data required for calculation of the satellite navigation data is received. The digital signal processing means 112 includes a correlator 114 and a real time clock application unit 116.

The power managing apparatus in accordance with the present invention will be described in more detail with reference to Fig. 4 to Fig. 9.

Fig. 4 is a graph describing an algorithm of the power managing apparatus for GPS receiver shown in Fig. 3.

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In Fig. 4, the digital signal processing means 112 generates signals as shown in Fig. 5b from satellite signals as shown in Fig. 5a, the navigation data processing means 118 estimates the power break time by using a correction function for real time clock of the real time clock application unit 116. In addition, the navigation data processing means 118 controls the power supply means 120 to intermittently supply power for the intermediate frequency generating means 110 and the digital signal processing means 112 based on the estimated power break time. The real time clock application unit 116 corrects the real time clock by using a clock source of the GPS receiver. The clock source of the GPS receiver, for example, may be a main clock of the digital application processing means 112.

Thus, the intermediate frequency generating means 110 and the digital signal processing means 112 are supplied with power from the power supply means 120, and operate only while information required for a navigation calculation is received from satellites. Symbols 'RF', 'DSP' and 'CPU' shown in Fig. 4 mean the intermediate frequency generating means 110, the digital signal processing means 112 and the navigation data processing means 118, respectively.

Precise estimation of the power break time or power supply interruption time is required in order to maintain a signal synchronization. For a precise estimation of the

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power break time, a method for estimating the power break time by using the real time clock may be used. In general, however, various crystal oscillators used for the real time clock have different frequencies which may differ from a product to another, and further frequency characteristics of each crystal oscillator may vary with time. Thus, it is difficult to maintain the signal synchronization by using a nominal frequency value presented by an oscillator manufacturer. Therefore, an extra means is required to estimate an oscillator frequency used in a real time application.

Referring to Fig. 6, the real time clock application unit 116 comprises a write register 60, a frequency measuring unit 62, a power supply control unit 64 for controlling power supply time and a read register 66.

As shown in Fig.6, the write register 60 provides the frequency measuring unit 62 with an initial value of a calibration counter set as illustrated in Fig. 7d and signals as illustrated in Fig. 8b. In addition, the write register 60 provides a wake-up time for the navigation data processing means 118 for the control unit 64 as shown in Fig. 7e.

The frequency measuring unit 62 estimates frequencies of the real time clock. In detail, the frequency measuring unit 62 counts the number of main clocks within the real time clocks, as shown in Fig. 7a, defined by a user and

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provided from an outside, and transfers the number of the main clocks to the navigation data processing means 118 via the read register 66.

The power supply control unit 64 controls a power supply time, in particular, receives the wake-up time of the navigation data processing means 118 from the write register 60 and transfers signals as shown in Fig. 7f to the navigation data processing means 118. For example, if the navigation data processing means 118 sets a value of "7" for the wake-up time, the power supply control unit 64 provides signals as shown in Fig.7f to the navigation data processing means 118 after seven clocks of the real time clock as Fig. 7a. The signals as shown in Fig. 7b are provided from an outside. The signals as shown in Fig.7f may be used as an interrupt of the navigation data processing means 118.

The signals as depicted in Fig. 8c are internal signals as a down counter using the real time clock as shown in Fig. 8a, and the signals in Fig. 8d are maintained at a value of "1" during the signals of Fig. 8c are not zero.

The signals as shown in Fig. 8g are internal signals for transferring the main clock while the signals of Fig. 8d remain "1" level. The signals as shown in Fig. 8h keep count by using the main clocks transferred. Latching and clearing operations of signals may be performed by using

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Google LLC et al v. Nariste Networks Pty. Ltd.

the internal signals as shown in Fig. 8e and Fig. 8f. Latched signals are transferred to the read register 66.

Though, however, estimation of a frequency of a clock used for a real time application is readily obtainable by using the frequency measuring unit 62, an estimation error may increase in proportion to the increase of the power break time because of time-varying characteristics of the crystal oscillator. Therefore, a signal processor in accordance with the present invention is designed to be capable of maintaining synchronization by using a plurality of integrators despite the existence of an error ranging ±5 microseconds.

Fig.9 is a block diagram illustrating an example of the correlator 114 as shown in Fig. 3, wherein the correlator comprises a carrier generator 70, a first carrier mixer 72, a second carrier mixer 74, a code generator 76, a multi-phase C/A code generator 78, a first to a thirty-second code mixers 80~84, 92~96, and a first to a thirty-second integrator 86~90, 98~102.

In Fig. 9, the carrier generator 70 generates sinusoidal signals used for eliminating a carrier wave from satellite signals. The carrier generator 70 inputs the frequency provided for the navigation data processing means 118, generates sine signals (I) and cosine signals (Q), and provides the sine and cosine signals to the first and second carrier mixers 72 and 74, respectively.

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Google LLC et al v. Nariste Networks Pty. Ltd.

The first carrier mixer 72 multiplies the sine signals (I) from the carrier generator 70 by a digital intermediate frequency from the intermediate frequency generating means 110, and provides multiplied signals for the first to the sixteenth code mixers 80~84.

The code generator 76 generates a reference frequency used for generating a PRN code of GPS, and feeds the reference frequency to the multi-phase C/A code generator 78.

The multi-phase C/A code generator 78 generates 16 numbers of PRN codes with different phase each other by using the reference frequency from the code generator 76, and provides the PRN codes for the first to the thirty-second code mixers 80~96.

The first code mixer 80 multiplies the PRN code from the multi-phase C/A code generator 78 by an output of the first carrier mixer 72, and consequently, provides multiplied signals for the first integrator 86. The first integrator 86 integrates an output of the first code mixer 80 during one period of a C/A code, i.e., 1 millisecond, and provides an integration result for the navigation data processing means 118.

The second code mixer 82 multiplies the PRN code from the multi-phase C/A code generator 78 by an output of the first carrier mixer 72, and provides multiplied signals for the second integrator 88. The second integrator 88

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Google LLC et al v. Nariste Networks Pty. Ltd.

integrates an output of the second code mixer 82 during one period of a C/A code, i.e., 1 millisecond, and provides an integration result for the navigation data processing means 118.

The sixteenth code mixer 84 multiplies the PRN code from the multi-phase C/A code generator 78 by an output of the first carrier mixer 72, and provides multiplied signals for the sixteenth integrator 90. The sixteenth integrator 90 integrates an output of the sixteenth code mixer 84 during one period of a C/A code, i.e., 1 millisecond, and provides an integration result for the navigation data processing means 118.

Similarly, each of the seventeenth, the thirty-first and the thirty-second code mixers 92, 94, and 96 multiplies the PRN code from the multi-phase C/A code generator 78 by an output of the second carrier mixer 74, and provides multiplied signals for the seventeenth, the thirty-first and the thirty-second integrators 98, 100 and 102. Each of the seventeenth, the thirty-first and the thirty-second integrators 98, 100 and 102 integrates an output of the seventeenth, the thirty-first and the thirty-second code mixers 92, 94 and 96 during one period of a C/A code, i.e., 1 millisecond, and provides an integration result for the navigation data processing means 118.

The power supply means 120 controls power supplied to the intermediate frequency generating means 110 and the

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Google LLC et al v. Nariste Networks Pty. Ltd.

digital signal processing means 112 pursuant to power control signals provided from the navigation data processing means 118.

Industrial Applicability

In accordance with the present invention, it is possible to fast acquire signals from satellites by using the power break time estimated by a correction function for a real time clock and simultaneous search of a plurality of code phase corresponding to GPS signals, and thus to prevent unnecessary power consumption of a GPS receiver.

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Google LLC et al v. Nariste Networks Pty. Ltd.

What is claimed is:

1. A power managing apparatus for a GPS receiver comprising:

an intermediate frequency generating means for converting an intermediate a radio frequency received from a satellite into an intermediate frequency signals;

a digital signal processing means for generating processed digital signals by processing the intermediate frequency signal provided by the intermediate frequency generating means to be used in a navigation data processes, and performing a correction of a real time clock;

a navigation data processing means for calculating satellite navigation data based on the processed digital signals from the digital signal processing means, estimating a power break time, and generating power control signals for use in providing power to the intermediate frequency generating means and the digital signal processing means only when satellite data required for a calculation of the satellite navigation data is received; and

a power supply means for controlling a power supplied to the intermediate frequency generating means and the digital signal processing means on the basis of the power control signals provided from the navigation data processing means.

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Google LLC et al v. Nariste Networks Pty. Ltd.

2. The apparatus as claimed in claim 1,

the power break time of the navigation data processing means is estimated and determined by using both the correction of the real time clock of the digital signal processing means and search of a plurality of code phase correspondent to a pseudo random noise (PRN) code of satellite data from the satellite.

3. The apparatus as claimed in claim 1 or 2,

the correction of the real time clock is performed by using a clock source of the GPS receiver.

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Google LLC et al v. Nariste Networks Pty. Ltd.

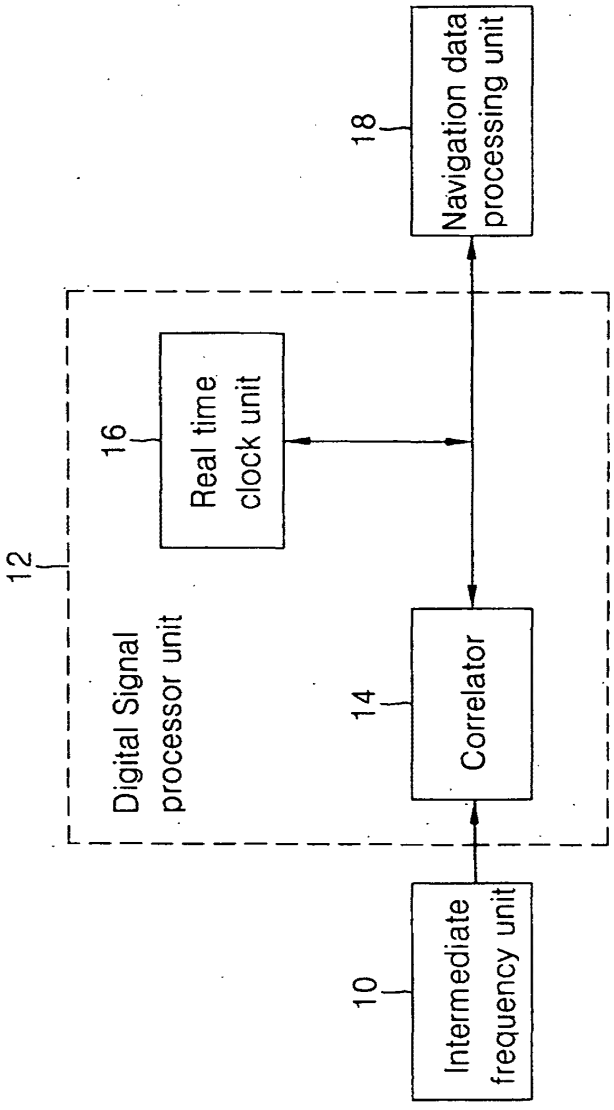


FIG. 1

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Google LLC et al v. Nariste Networks Pty. Ltd.

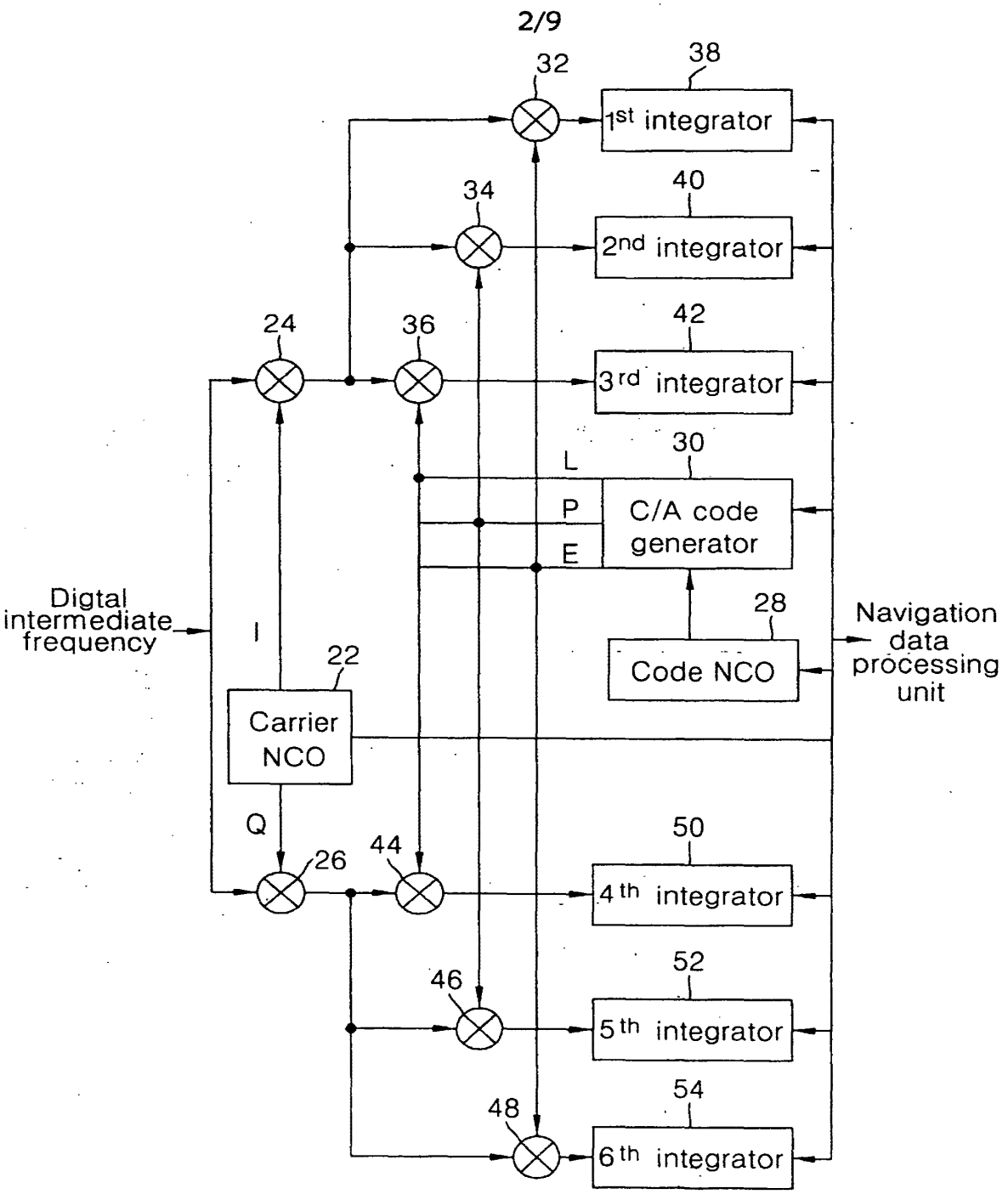

32
38
1st integrator
34
40
2nd integrator
24
36
42
3rd integrator
L
30
P
C/A code generator
E
Digtal intermediate frequency
I
28
Navigation data processing unit
22
Code NCO
Carrier NCO
Q
26
44
50
4th integrator
46
52
5th integrator
48
54
6th integrator

FIG.2

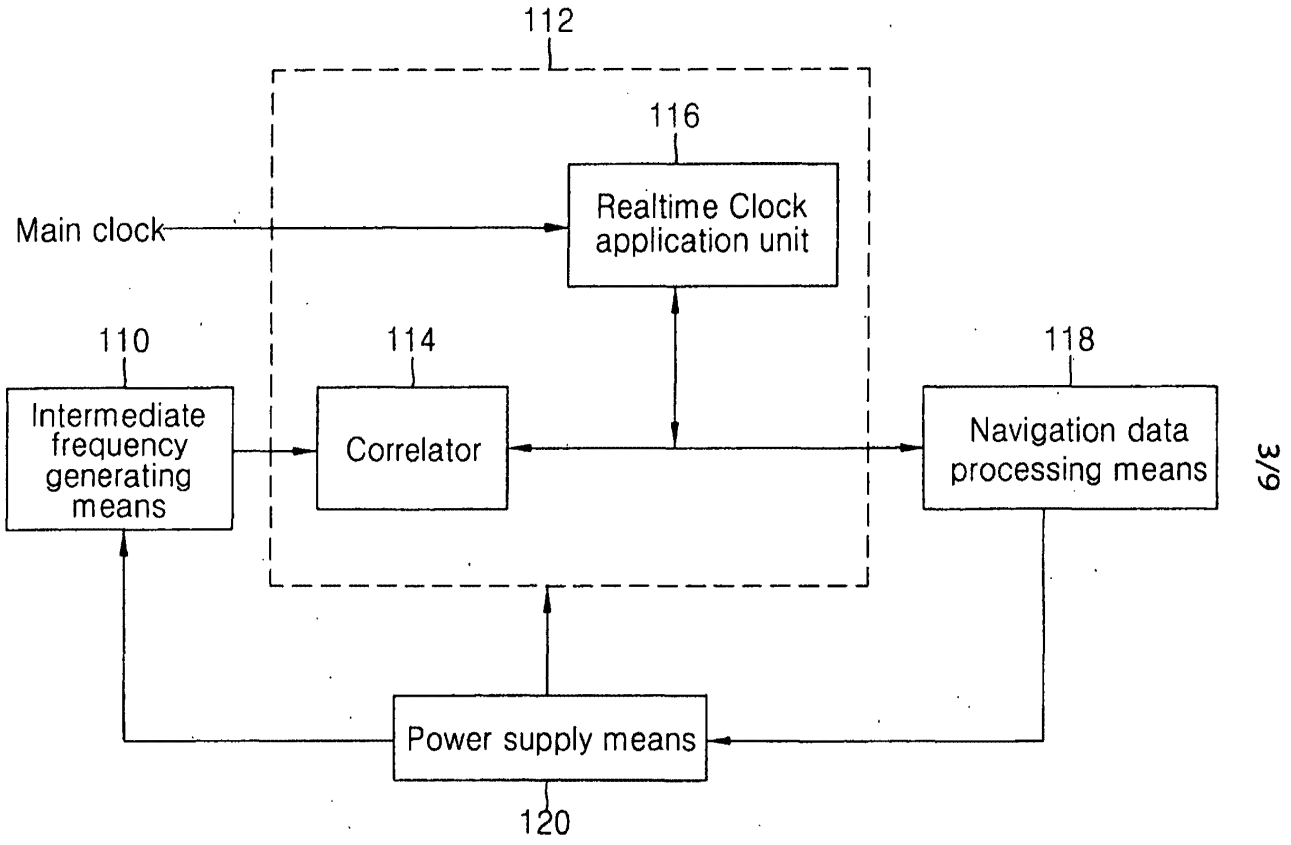

112
116
Realtime Clock application unit
Main clock
110
Intermediate frequency generating means
114
Correlator
118
Navigation data processing means
Power supply means
120

FIG.3

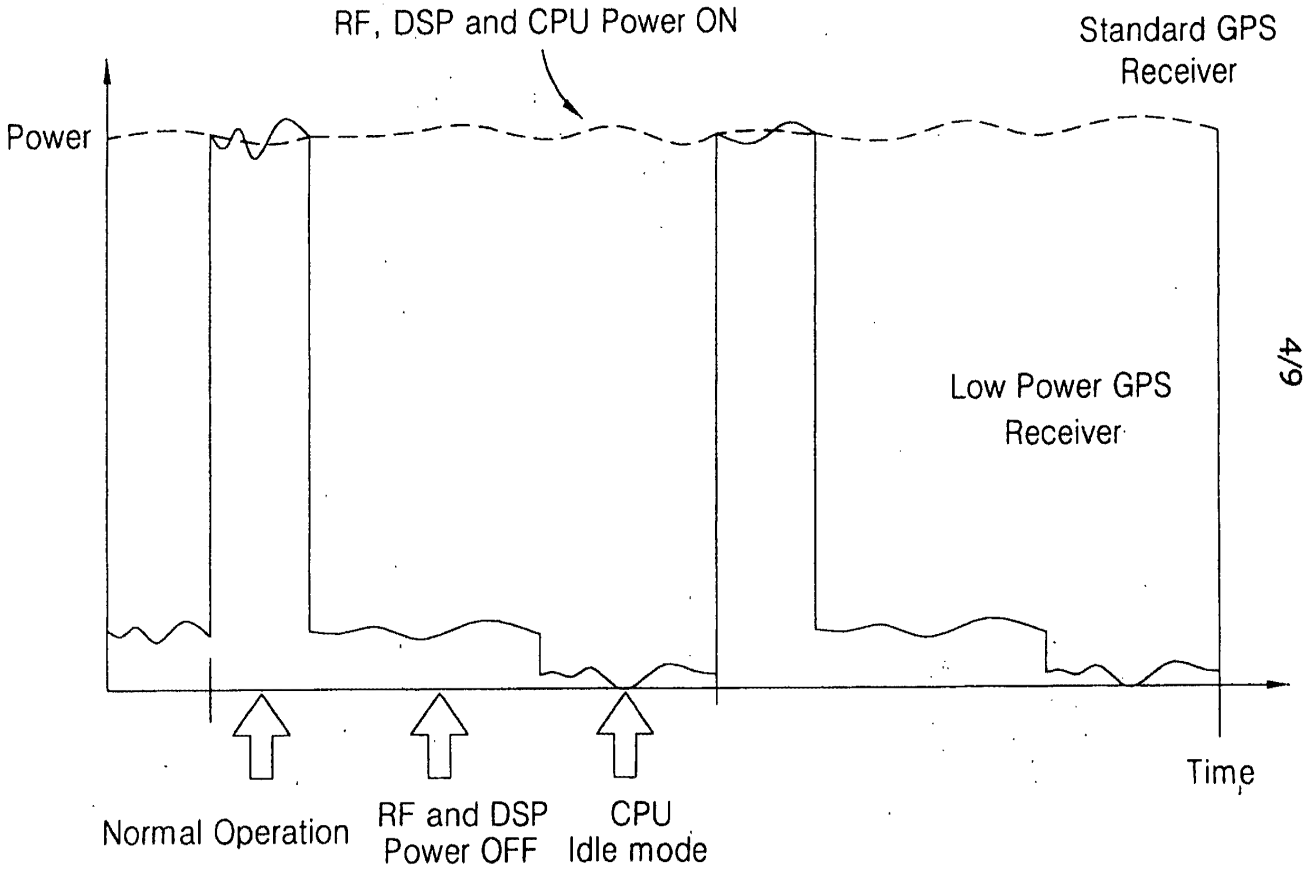

RF, DSP and CPU Power ON
Standard GPS Receiver
Power
Low Power GPS Receiver
Time
Normal Operation
RF and DSP Power OFF
CPU Idle mode

FIG. 4

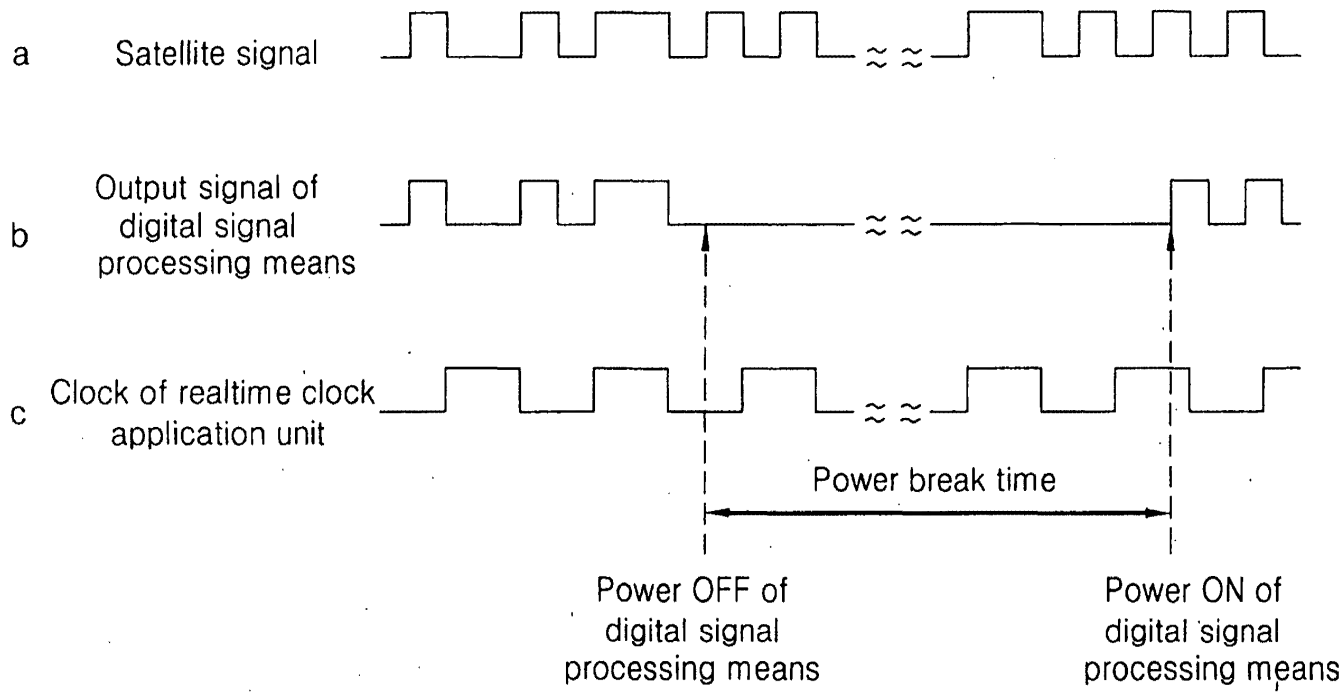

a
Satellite signal
b
Output signal of digital signal processing means
c
Clock of realtime clock application unit
Power break time
Power OFF of digital signal processing means
Power ON of digital signal processing means

FIG.5

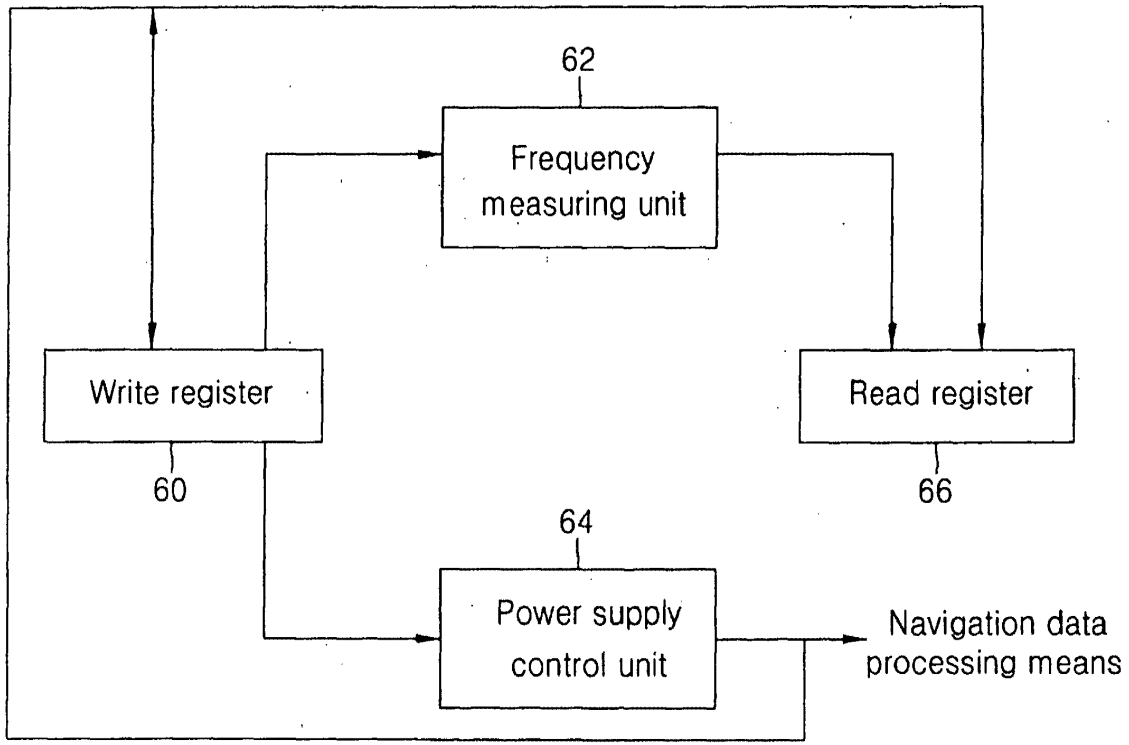

62
Frequency measuring unit
Write register
60
Read register
66
64
Power supply control unit
Navigation data processing means

FIG.6

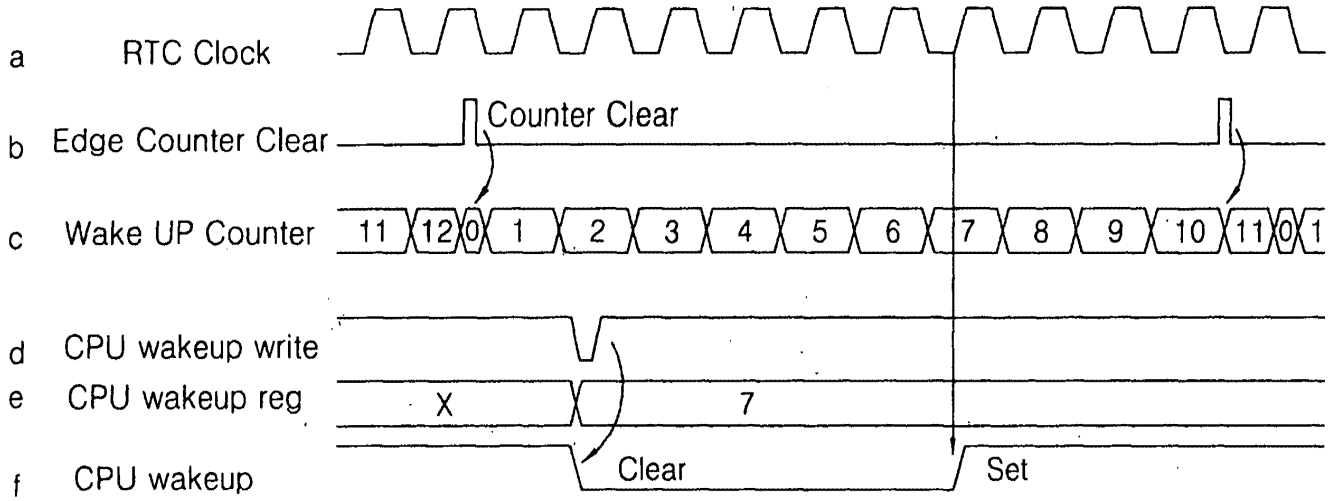

a RTC Clock
b Edge Counter Clear
Counter Clear
c Wake UP Counter
11 12 0 1 2 3 4 5 6 7 8 9 10 11 0 1
d CPU wakeup write
e CPU wakeup reg
X
7
f CPU wakeup
Clear
Set

FIG. 7

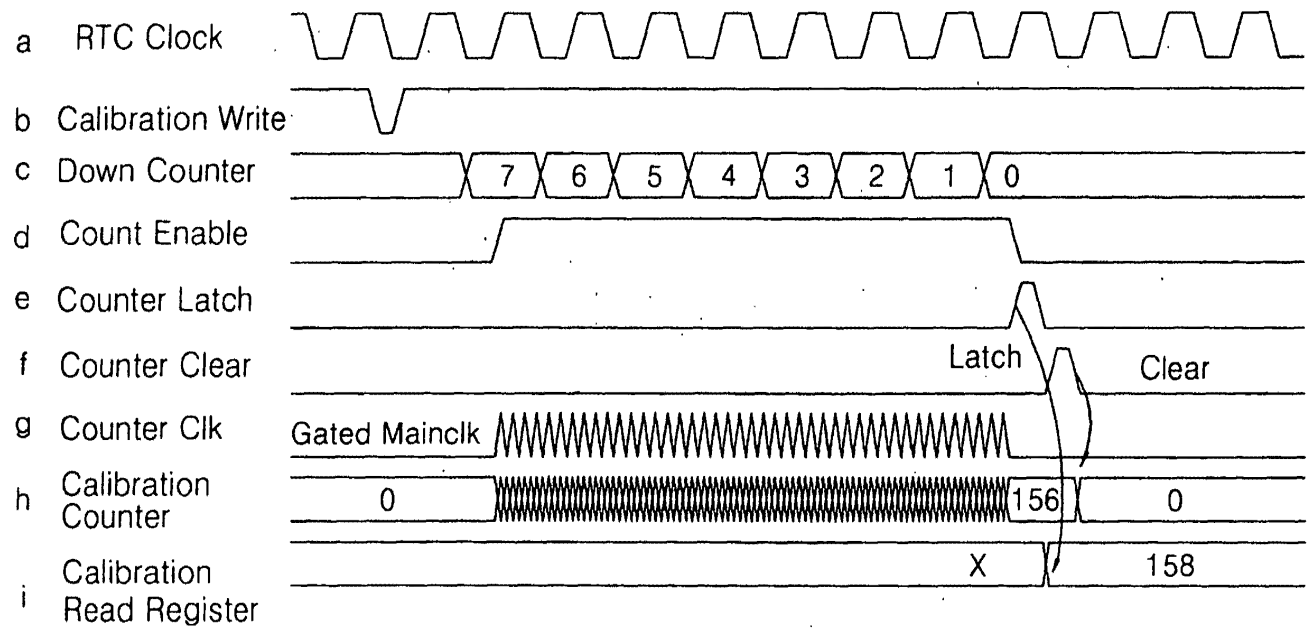

a RTC Clock
b Calibration Write
c Down Counter
7
6
5
4
3
2
1
0
d Count Enable
e Counter Latch
f Counter Clear
Latch
Clear
g Counter Clk
Gated Mainclk
h Calibration Counter
0
156
0
i Calibration Read Register
X
158

FIG.8

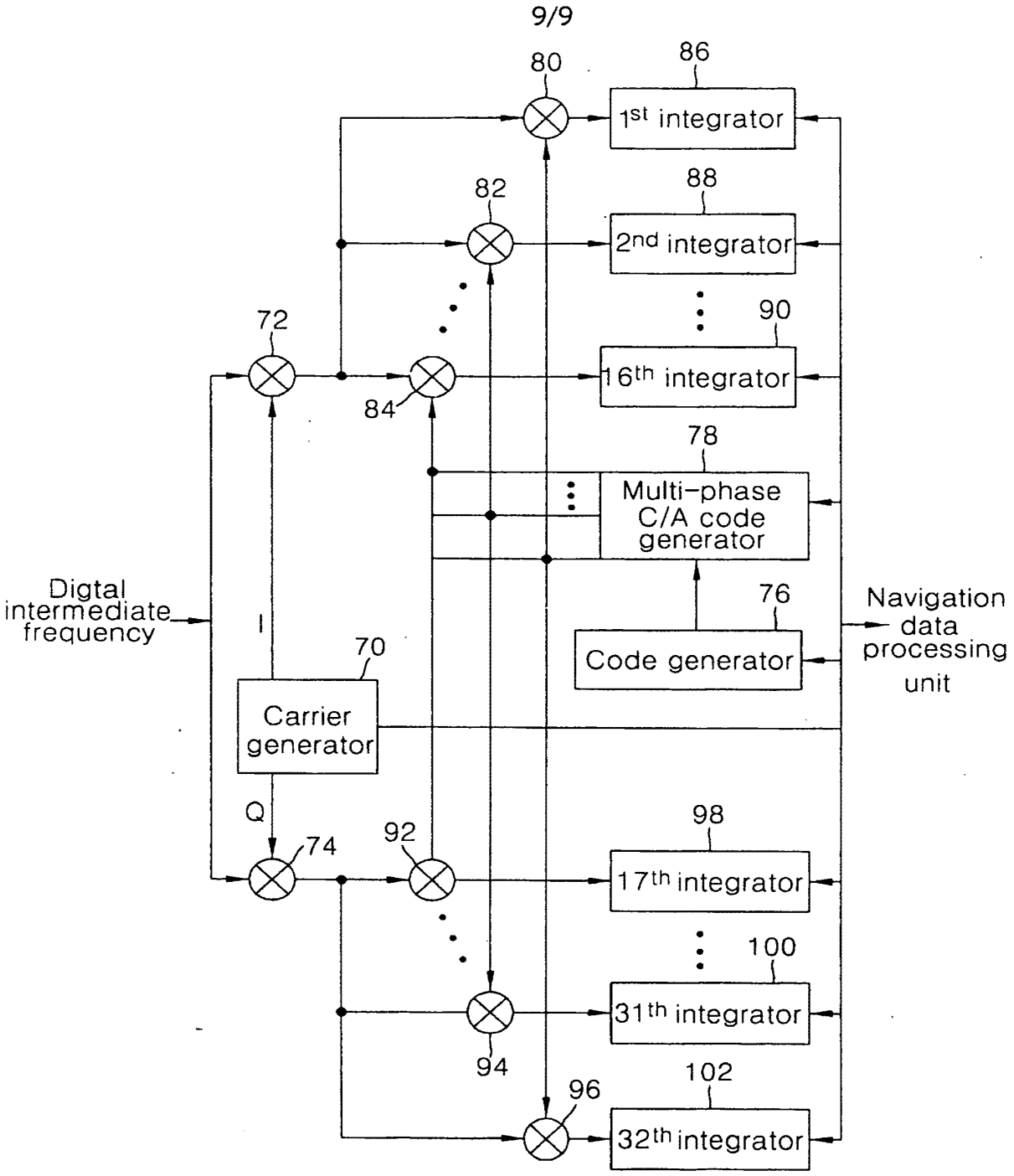

80
86
1st integrator
82
88
2nd integrator
72
90
16th integrator
84
78
Multi-phase C/A code generator
Digtal intermediate frequency
I
76
Navigation data processing unit
70
Code generator
Carrier generator
Q
74
92
98
17th integrator
100
31th integrator
94
96
102
32th integrator

FIG. 9

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR02/00799

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 G01S 5/02

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC7 G01S 5/02

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

Electronic data base consulted during the intertnational search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6,133,871 A(SnapTrack, Inc.) Oct. 17, 2000 see col. 4 ~ 20, fig. 2 ~ 7	1 ~ 3
A	US 5,995,042 A(Motorola, Inc.) Nov. 30, 1999 see col. 2 ~ 7, fig. fig. 2	1 ~ 3

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

☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevence
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevence; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevence; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
29 JULY 2002 (29.07.2002)	29 JULY 2002 (29.07.2002)

Name and mailing address of the ISA/KR	Authorized officer
Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	KIM, Jae Mun Telephone No. 82-42-481-5673

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

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2005/001351

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. [7]: G01S 5/00

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
WPAT, USPTO, IEEE keywords: global positioning system, gps, power, adapt:, estimat:, predic:, emergenc: and similar words

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 2003/083814 A (GRONEMEYER) 1 May 2003 See whole document	1 to 7; 9 to 36 8
X	US 2003/0107514 A (SYRJARINNE et al) 12 June 2003 See whole document	1 to 7; 9 to 36
X	WO 2002/088769 A (NAVICOM CO. LTD) 7 November 2002 Page 7, line 4 to page 11, line 12: Figures 4 to 9	1 to 7; 9 to 36
A Y	US 6590525 B2 (YULE et al.) 8 July 2003 See abstract	1 to 7; 9 to 36 8

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

* Special categories of cited documents:

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

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

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

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

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

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

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

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

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11 October 2005	14 OCT 2005
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized officer S KAUL Telephone No : (02) 6283 2182

EXPRESS MAIL LABEL
NO.: EV 927 568 293 US

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/AU2005/001351

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
US	2003083814	CN	1610836	EP	1451605	US	6662107
		US	2004225439	WO	03038464	WO	2005001388
US	2003107514	US	6812887				
WO	02088769	KR	2002083747				
US	6590525	CN	1363045	CN	1366615	EP	1173779
		EP	1175625	US	6501420	US	2001017598
		US	2001017599	WO	0163316	WO	0163317

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

END OF ANNEX

EXPRESS MAIL LABEL
NO.: EV 927 568 293 US

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2005/001351

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. [7]: G01S 5/00

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
WPAT, USPTO, IEEE keywords: global positioning system, gps, power, adapt:, estimat:, predic:, emergenc: and similar words

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 2003/083814 A (GRONEMEYER) 1 May 2003 See whole document	1 to 7; 9 to 36 8
X	US 2003/0107514 A (SYRJARINNE et al) 12 June 2003 See whole document	1 to 7; 9 to 36
X	WO 2002/088769 A (NAVICOM CO. LTD) 7 November 2002 Page 7, line 4 to page 11, line 12: Figures 4 to 9	1 to 7; 9 to 36
A Y	US 6590525 B2 (YULE et al.) 8 July 2003 See abstract	1 to 7; 9 to 36 8

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

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

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

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

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

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

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

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

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

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11 October 2005	14 OCT 2005

Name and mailing address of the ISA/AU	Authorized officer
AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	**S KAUL** Telephone No : (02) 6283 2182

EXPRESS MAIL LABEL NO.: EV 927 568 293 US

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/AU2005/001351

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
US	2003083814	CN	1610836	EP	1451605	US	6662107
		US	2004225439	WO	03038464	WO	2005001388
US	2003107514	US	6812887				
WO	02088769	KR	2002083747				
US	6590525	CN	1363045	CN	1366615	EP	1173779
		EP	1175625	US	6501420	US	2001017598
		US	2001017599	WO	0163316	WO	0163317

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

END OF ANNEX

EXPRESS MAIL LABEL NO.: EV 927 568 293 US

U 016731-5

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 672078C	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/AU2005/001351	International filing date *(day/month/year)* 31 August 2005	Priority date *(day/month/year)* 2 September 2004

International Patent Classification (IPC) or national classification and IPC

Int. Cl.

G01S 5/00 (2006.01)

Applicant

MALANEY, Robert Anderson

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☐ *(sent to the applicant and to the International Bureau)* a total of sheets, as follows:
      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or table related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
3 July 2006	18 July 2006
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer **ATA MAQBOOL** Telephone No. (02) 6283 7905

EXPRESS MAIL LABEL NO.: EV 927 568 293 US

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/AU2005/001351

Box No. I Basis of the report

1. With regard to the **language**, this report is based on:

[X] The international application in the language in which it was filed

[ ] A translation of the international application into , which is the language of a translation furnished for the purposes of:

[ ] international search (under Rules 12.3(a) and 23.1 (b))

[ ] publication of the international application (under Rule 12.4(a))

[ ] international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

[ ] the international application as originally filed/furnished

[X] the description:

pages **1-18** as originally filed/furnished
pages* received by this Authority on with the letter of
pages* received by this Authority on with the letter of

[X] the claims:

pages as originally filed/furnished
pages* as amended (together with any statement) under Article 19
pages* **19-25** received by this Authority on **3 July 2006** with the letter of **3 July 2006**
pages* received by this Authority on with the letter of

[X] the drawings:

pages **1/6-6/6** as originally filed/furnished
pages* received by this Authority on with the letter of
pages* received by this Authority on with the letter of

[ ] a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. [ ] The amendments have resulted in the cancellation of:

[ ] the description, pages
[ ] the claims, Nos.
[ ] the drawings, sheets/figs
[ ] the sequence listing *(specify)*:
[ ] any table(s) related to the sequence listing *(specify)*:

4. [ ] This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

[ ] the description, pages
[ ] the claims, Nos.
[ ] the drawings, sheets/figs
[ ] the sequence listing *(specify)*:
[ ] any table(s) related to the sequence listing *(specify)*:

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/AU2005/001351

Box No. V **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-40	YES
	Claims		NO
Inventive step (IS)	Claims	1-40	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-40	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

NOVELTY (N) & INVENTIVE STEP (IS)

The claims are considered novel and inventive over the cited prior art documents because none of the citations either individually or in obvious combination disclose the features of amended independent claims 1, 12 and 23. Furthermore it is accepted that none of the citations specifically teach the use of a "neural network' in estimating a new value for a power-up period as recited in independent claims 34 and 35.

The remaining claims being dependent from the above independent claims consequently also satisfy the requirements of novelty and inventive step.

IAP15 Rec'd PCT/PTO 01 MAR 2007
11/661707

Practitioner's Docket No. U 016731-5

Optional Customer No. Bar Code

00140
PATENT TRADEMARK OFFICE

CHAPTER II

TRANSMITTAL LETTER TO THE UNITED STATES ELECTED OFFICE (EO/US)

(ENTRY INTO U.S. NATIONAL PHASE UNDER CHAPTER II)

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/AU2005/001351	31 AUGUST 2005	02 SEPTEMBER 2004

TITLE OF INVENTION

SELF MONITORING GPS ON MOBILE DEVICE

APPLICANT(S)

1. MALANEY, Robert Anderson

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

ATTENTION: EO/US

CERTIFICATION UNDER 37 C.F.R. 1.10*
*(Express Mail label number is **mandatory**.)*
(Express Mail certification is optional.)

I hereby certify that this correspondence and the documents referred to as attached therein are being deposited with the United States Postal Service on this date **March 1, 2007**, in an envelope as "Express Mail Post Office to Addressee," Mailing Label Number **EV 927 568 293 US**, addressed to the: Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.

Geraldine Marti
(type or print name of person mailing paper)
Geraldine Marti
Signature of person mailing paper

WARNING: *Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R. 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.*

***WARNING:** *Each paper or fee filed by "Express Mail" **must** have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. 1.10(b).*
*"Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will **not** be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.*

EXPRESS MAIL LABEL NO.: EV 927 568 293 US

*NOTE: To avoid abandonment of the application, the applicant shall furnish to the USPTO, not later than the expiration of **30** months from the priority date: (1) a copy of the international application, unless it has been previously communicated by the International Bureau or unless it was originally filed in the USPTO; and (2) the basic national fee (see 37 C.F.R. § 1.492(a)). The 30-month time limit may not be extended. 37 C.F.R. § 1.495(a) and (b).*

WARNING: *Where the items are those which can be submitted to complete the entry of the international application into the national phase are subsequent to 30 months from the priority date the application is still considered to be in the international state and if mailing procedures are utilized to obtain a date the express mail procedure of 37 C.F.R. §1.10 must be used (since international application papers are not covered by an ordinary certificate of mailing - See 37 C.F.R. §1.8.*

NOTE: Documents and fees must be clearly identified as a submission to enter the national state under 35 USC 371 otherwise the submission will be considered as being made under 35 USC 111. 37 C.F.R. § 1.494(f).

1. Applicant herewith submits to the United States Elected Office (EO/US) the following items under 35 U.S.C. 371:

a. [X] This express request to immediately begin national examination procedures (35 U.S.C. 371(f)).

b. [X] The U.S. National Fee (35 U.S.C. 371(c)(1)) and other fees (37 C.F.R. § 1.492) as indicated below:

c. [ ] **ADDED PAGES FOR APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED**

NOTE: § 1.495 Entering the national stage in the United States of America.

(a) The applicant in an international application must fulfill the requirements of 35 U.S.C 371 within the time periods set forth in paragraphs (b) and (c) of this section in order to prevent the abandonment of the international application as to the United States of America. The thirty month time period set forth in paragraphs (b), (c) (d), (e) and (h) of this section may not be extended. International applications for which those requirements are timely fulfilled will enter the national stage and obtain an examination as to the patentability of the invention in the United States of America.

(b) To avoid abandonment of the application, the applicant shall furnish to the United Stats Patent and Trademark Office not later than the expiration of thirty months from the priority date:

(1) A copy of the international application, unless it has been previously communicated by the International Bureau or unless it was originally filed in the United States Patent and Trademark Office; and

(2) The basic national fee (see § 1.492(a)).

(c)(1) If applicant complies with paragraph (b) of this section before expiration of thirty months from the priority date, the Office will notify the applicant if he or she has omitted any of:

(i) A translation of the international application, as filed, into the English language, if it was originally filed in another language (35 U.S.C. 371(c)(2));

(ii) The oath or declaration of the inventor (35 U.S.C. 371(c)(4) and § 1.497), if a declaration of inventorship in compliance with § 1.497 has not been previously submitted in the international application under PCT Rule 4.17 (iv) within the time limits provided for in PCT Rule 26ter.1;

(ii) The search fee set forth in § 1.492(c); and

(iv) The examination fee set forth in § 1.492(c); and

(v) Any application size fee required by § 1.492(j)

(2) A notice under paragraph (c)(1) of this section will set a period of time within which applicant must provide any omitted translation, oath or declaration of the inventor, search fee set forth in § 1.492(b), examination fee set forth in § 1.492(c), and any application size fee required by § 1.492(j) in order to avoid abandonment of the application.

(3) The payment of the processing fee set forth in § 1.492(i) is required for acceptance of English translation later than the expiration of thirty months after the priority date. The payment of the surcharge set forth in § 1.429(h) is required for acceptance of the oath or declaration the inventor later than the expiration of thirty months after the priority date.

2. Fees

CLAIMS FEE *	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
	TOTAL CLAIMS*	40 - 20 =	20	x $ 50.00 =	**$ 1,000.00 Not paid at this time**
	INDEPENDENT CLAIMS*	5 - 3 =	2	x $ 200.00 =	**400.00 Not paid at this time**
	MULTIPLE DEPENDENT CLAIM(S) (if applicable) + $360.00				
FILING FEES**	[x] Basic filing Fee				$300.00
	[x] Non-U.S. Search Report filed			($400.00)	$400.00
	[ ] No Search Report			($500.00)	
	[x] Exam Fee not paid to U. S.			($200.00)	$200.00
	[ ] Search and Exam fee with U.S. WO or IPER conditions not satisfied			($100.00)	
	[ ] Search and Exam fee with U.S. WO or IPER conditions satisfied			($0.00)	
	[ ] Additional fee for specification and drawings filed in paper over 100 sheets (excluding sequence listing or computer program listing filed in electronic medium). The fee is $250 for each additional 50 sheets paper or fraction thereof			($)	
	Total of above Calculations				=$900.00
SMALL ENTITY	Reduction by ½ for filing by small entity, if applicable. Statement may also be filed. (note 37 CFR 1.9, 1.27, 1.28)				-$450.00
	Subtotal				$450.00
	Total National Fee				$450.00
	Fee for recording the enclosed assignment document $40.00 (37 CFR 1.21(h)). (See Item 13 below). See attached "ASSIGNMENT COVER SHEET".				
TOTAL	Total Fees enclosed				$450.00

*May include Preliminary Amendment (see page 8) reducing the number of claims.

i. [x] A check in the amount of $ 450.00 to cover the above fees is enclosed.
ii. [ ] Please charge Account No. 12-0425 in the amount of $
A duplicate copy of this sheet is enclosed.

**WARNING: *"To avoid abandonment of the application the applicant shall furnish to the United States Patent and Trademark Office not later than the expiration of 30 months from the priority date: * * * (2) the basic national fee (see § 1.492(a)). The 30-month time limit may not be extended." 37 C.F.R. § 1.495(b).*

WARNING: *If the translation of the international application and/or the oath or declaration have not been submitted by the applicant within thirty (30) months from the priority date, such requirements may be met within a time period set by the Office. 37 C.F.R. § 1.495(b)(2). The payment of the surcharge set forth in § 1.492(e) is required as a condition for accepting the oath or declaration later than thirty (30) months after the priority date. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than thirty (30) months after the priority date. Failure to comply with these requirements will result in abandonment of the application. The provisions of § 1.136 apply to the period which is set. Notice of Jan. 3, 1993, 1147 O.G. 29 to 40.*

[x] Assertion of Small Entity Status

[x] Applicant hereby asserts status as a small entity under 37 C.F.R. § 1.27 by.
[ ] a Statement or Written Assertion attached.
[x] fee payment

NOTE: *37 C.F.R. § 1.27(c) deals with the assertion of small entity status, whether by a written specific declaration thereof or by payment as a small entity of the basic filing fee or the fee for the entry into the national phase as states:*

"(c) Assertion of small entity status. Any party (person, small business concern or nonprofit organization) should make a determination, pursuant to paragraph (f) of this section, of entitlement to be accorded small entity status based on the definitions set forth in paragraph (a) of this section, and must, in order to establish small entity status for the purpose of paying small entity fees, actually make an assertion of entitlement to small entity status, in the manner set forth in paragraph (c)(1) or (c)(3) of this section, in the application or patent in which such small entity fees are to be paid.

(1) Assertion by writing. Small entity status may be established by a written assertion of entitlement to small entity status. A written assertion must:

(i) Be clearly identifiable;

(ii) Be signed (see paragraph (c)(2) of this section); and

(iii) Convey the concept of entitlement to small entity status, such as by stating that applicant is a small entity, or that small entity status is entitled to be asserted for the application or patent. While no specific words or wording are required to assert small entity status, the intent to assert small entity status must be clearly indicated in order to comply with the assertion requirement.

(2) Parties who can sign and file the written assertion. The written assertion can be signed by:

(i) One of the parties identified in §§ 1.33(b) (e.g., an attorney or agent registered with the Office), §§ 3.73(b) of this chapter notwithstanding, who can also file the written assertion;

(ii) At least one of the individuals identified as an inventor (even though a §§ 1.63 executed oath or declaration has not been submitted), notwithstanding §§ 1.33(b)(4), who can also file the written assertion pursuant to the exception under §§ 1.33(b) of this part; or

(iii) An assignee of an undivided part interest, notwithstanding §§ 1.33(b)(3) and 3./73(b) of this chapter, but the partial assignee cannot file the assertion without resort to a party identified under §§ 1.33(b) of this part.

(3) Assertion by payment of the small entity basic filing or basic national fee. The payment, by any party, of the exact amount of one of the small entity basic filing fees set forth in §§ 1.16(a), (f), (g), (h), or (k), or one of the small entity basic national fees set forth in §§ 1.492(a)(1), (a)(2), (a)(3), (a)(4) or (a)(5), will be treated as a written assertion of entitlement to small entity status even if the type of basic filing or basic national fee is inadvertently selected in error.

(i) If the Office accords small entity status based on payment of a small entity basic filing or basic national fee under paragraph (c)(3) of this section that is not applicable to that application, any balance of the small entity fee that is applicable to that application will be due along with the appropriate surcharge set forth in §§ 1.16(e) or §§ 1.16(l).

(ii) The payment of any small entity fee other than those set forth in paragraph (c)(3) of this section (whether in the exact fee amount or not) will not be treated as a written assertion of entitlement to small entity status and will not be sufficient to establish small entity status in an application or a patent."

3. [x] A copy of the International application as filed (35 U.S.C. 371(c)(2)):

NOTE: Section 1.495 (b) was amended to require that the basic national fee and a copy of the international application must be filed with the Office by 30 months from the priority date to avoid abandonment "The International Bureau normally provides the copy of the international application to the Office in accordance with PCT Article 20. At the same time, the International Bureau notifies applicant of the communication to the Office. In accordance with PCT Rule 47.1, that notice shall be accepted by all designated offices as conclusive evidence that the communication has duly taken place. Thus, if the applicant desires to enter the national stage, the applicant normally need only check to be sure the notice from the International Bureau has been received and then pay the basic national fee by 30 months from the priority date." Notice of Jan. 7, 1993, 1147 O.G. 29 to 40, at 35-36. See item 14c below.

a. [ ] is transmitted herewith.
b. [ ] is not required, as the application was filed with the United States Receiving Office.
c. [x] has been transmitted
   i. [x] by the International Bureau.
   Date of mailing of the application (from form PCT/IB/308): 04 January 2007
   ii. [ ] by applicant on _____
   Date

4. [x] A translation of the International application into the English language (35 U.S.C. 371(c)(2)):
a. [ ] is transmitted herewith.
b. [x] is not required as the application was filed in English.
c. [ ] was previously transmitted by applicant on
   Date
d. [ ] will follow.

*NOTE: 37 C.F.R. § 1.495(c): "If applicant complies with paragraph (b) of this section before expiration of **thirty** months from the priority date but omits . . . a translation of the international application, as filed, into the English language, if it was originally filed in another language (35 U.S.C. 371(c)(2)) . . . applicant will be so notified and given a period of time within which to file the translation . . . in order to prevent abandonment of the application. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than the expiration of **thirty** months after the priority date . . . . A 'Sequence Listing' need not be translated if the "Sequence Listing' complies with PCT Rule 12.1(d) and the description complies with PCT Rule 5.2(b)."*

5. [x] Amendments to the claims of the International application under PCT Article 19 (35 U.S.C. 371(c)(3)):

NOTE: The Notice of January 7, 1993 points out that 37 C.F.R. § 1.495(a) was amended to clarify the existing and continuing practice that PCT Article 19 amendments must be submitted by 30 months from the priority date and this deadline may not be extended. The Notice further advises that: "The failure to do so will not result in loss of the subject matter of the PCT Article 19 amendments. Applicant may submit that subject matter in a preliminary amendment filed under section 1.121. In many cases, filing an amendment under section 1.121 is preferable since grammatical or idiomatic errors may be corrected." 1147 O.G. 29-40, at 36.

*NOTE: 37 C.F.R. § 1.495(d): "A copy of any amendments to the claims made under PCT Article 19, and a translation of those amendments into English, if they were made in another language, must be furnished not later than the expiration of **thirty** months from the priority date. Amendments under PCT Article 19 which are not received by the expiration of **thirty** months from the priority date will be considered to be canceled."*

a. [ ] are transmitted herewith.
b. [X] have been transmitted
   i. [X] by the International Bureau.
   Date of mailing of the amendment (from form PCT/IB/308):
   ii. [ ] by applicant on _____.
   Date
c. [ ] have not been transmitted as
   i. [x] applicant chose not to make amendments under PCT Article 19.
   Date of mailing of Search Report (from form PCT/ISA/210): 14 October 2005.
   ii. [ ] the time limit for the submission of amendments has not yet expired. The amendments or a statement that amendments have not been made will be transmitted before the expiration of the time limit under PCT Rule 46.1.

6. [x] A translation of the amendments to the claims under PCT Article 19 (38 U.S.C. 371(c)(3)):
   a. [ ] is transmitted herewith.
   b. [ ] will follow
   c. [X] is not required as the amendments were made in the English language.
   d. [ ] has not been transmitted for reasons indicated at point 5(c) above.

7. [x] A copy of the international examination report (PCT/IPEA/409)
   [x] is transmitted herewith.
   [ ] is not required as the application was filed with the United States Receiving Office.

8. [ ] Annex(es) to the international preliminary examination report
   a. [ ] is/are transmitted herewith.
   b. [ ] is/are not required as the application was filed with the United States Receiving Office.

9. [ ] A translation of the annexes to the international preliminary examination report

*NOTE: 37 C.F.R. § 1.497(e) "A translation into English of any annexes to an international preliminary examination report (if applicable), if the annexes were made in another language, must be furnished not later than the expiration of **thirty** months form the priority date. Translations of the annexes which are not received by the expiration of **thirty** months from the priority date may be submitted within any period set pursuant to paragraph (c) of this section accompanied by the processing fee set forth in § 1.492(f). Annexes for which translations are not timely received will be considered canceled."*

a. [ ] is transmitted herewith.
b. [ ] is not required as the annexes are in the English language.

10. [x] An oath or declaration of the inventor (35 U.S.C. 371(c)(4)) complying with 35 U.S.C. 115
a. [ ] was previously submitted by applicant on
Date
b. [ ] is submitted herewith, and such oath or declaration
i. [ ] is attached to the application.
ii. [ ] identifies the application and any amendments under PCT Article 19 that were transmitted as stated in points 3(b) or 3(c) and 5(b); and states that they were reviewed by the inventor as required by 37 C.F.R. 1.70.
c. [x] will follow.

*NOTE: 37 C.F.R. § 1.495(c): "If applicant complies with paragraph (b) of this section before expiration of **thirty** months from the priority date but omits . . . the oath or declaration of the inventor (35 U.S.C. 371(c)(4) and § 1.497), if a declaration of inventorship in compliance with § 1.497 has not been previously submitted in the international application under PCT Rule 4.17(iv) within the time limits provided for in PCT Rule 26ter.1, applicant will be so notified and given a period of time within which to file the . . . oath or declaration in order to prevent abandonment of the application . . . . The payment of the surcharge set forth in § 1.492(e) is required for acceptance of the oath or declaration of the inventor later than the expiration of **thirty** months after the priority date."*

Other document(s) or information included:

11. [x] An International Search Report (PCT/ISA/210) or Declaration under PCT Article 17(2)(a):
a. [ ] is transmitted herewith.
b. [ ] has been transmitted by the International Bureau.
Date of mailing (from form PCT/IB/308):
c. [ ] is not required, as the application was searched by the United States International Searching Authority.
d. [ ] will be transmitted promptly upon request.
e. [ ] has been submitted by applicant on
Date

12. [x] An Information Disclosure Statement under 37 C.F.R. 1.97 and 1.98:
a. [x] is transmitted herewith.
Also transmitted herewith is/are:
[x] Form PTO-1449 (PTO/SB/08A and 08B).
[x] Copies of citations listed.
b. [ ] will be transmitted within THREE MONTHS of the date of submission of requirements under 35 U.S.C. 371(c).
c. [ ] was previously submitted by applicant on _____.
Date

13. [ ] An assignment document is transmitted herewith for recording.

A separate [ ] "COVER SHEET FOR ASSIGNMENT (DOCUMENT) ACCOMPANYING NEW PATENT APPLICATION" or [ ] FORM PTO 1595 is also attached.

14. [ ] Additional documents:
- a. [ ] Copy of request (PCT/RO/101)
- b. [x] International Publication No. **WO 2006/024112 A1**
  - i. [x] Specification, claims and drawing
  - ii. [ ] Front page only
- c. [ ] Preliminary amendment (37 C.F.R. § 1.121)
- d. [x] Other
  1. FORM PCT/IB/304
  2. FORM PCT/IB/306 (MAILED 07 JULY 2006)
  3. FORM PCT/IB/306 (MAILED 05 FEBRUARY 2007)
  4. FORM PCT/IPEA/401

15. [x] The above checked items are being transmitted
- a. [x] before 30 months from any claimed priority date.
- b. [ ] after 30 months.

16. [ ] Certain requirements under 35 U.S.C. 371 were previously submitted by the applicant on
, namely:

AUTHORIZATION TO CHARGE ADDITIONAL FEES

WARNING: *Accurately count claims, especially multiple dependent claims, to avoid unexpected high charges if extra claims are authorized.*

NOTE: *"A written request may be submitted in an application that is an authorization to treat any concurrent or future reply, requiring a petition for an extension of time under this paragraph for its timely submission, as incorporating a petition for extension of time for the appropriate length of time. An authorization to charge all required fees, fees under § 1.17, or all required extension of time fees will be treated as a constructive petition for an extension of time in any concurrent or future reply requiring a petition for an extension of time under this paragraph for its timely submission. Submission of the fee set forth in § 1.17(a) will also be treated as a constructive petition for an extension of time in any concurrent reply requiring a petition for an extension of time under this paragraph for its timely submission." 37 C.F.R. § 1.136(a)(3).*

NOTE: *"Amounts of twenty-five dollars or less will not be returned unless specifically requested within a reasonable time, nor will the payer be notified of such amounts; amounts over twenty-five dollars may be returned by check or, if requested, by credit to a deposit account." 37 C.F.R. § 1.26(a).*

[X] The Commissioner is hereby authorized to charge the following additional fees that may be required by this paper and during the entire pendency of this application to Account No. 12-0425 .

[X] 37 C.F.R. 1.492(a)(1) (basic filing fee)

WARNING: *Because failure to pay the national fee within 30 months without extension (37 C.F.R. § 1.495(b)(2)) results in abandonment of the application, it would be best to always check the above box.*

[ ] 37 C.F.R. 1.492(b) (search fee)
[ ] 37 C.F.R. 1.492(b) (exam fee)
[ ] 37 C.F.R. 1.492(b) (claim fees)

NOTE: Because additional fees for excess or multiple dependent claims not paid on filing or on later presentation must only be paid or these claims cancelled by amendment prior to the expiration of the time period set for response by the PTO in any notice of fee deficiency (37 C.F.R. § 1.492(d)), it might be best not to authorize the PTO to charge additional claim fees, except possible when dealing with amendments after final action.

[X] 37 C.F.R. 1.16(s) (spec and drawing, each 50 pages over 100)
[X] 37 C.F.R. 1.17 (application processing fees)
[X] 37 C.F.R. 1.17(a)(1)-(5) (extension fees pursuant to § 1.136(a).

NOTE: 37 C.F.R. 1.28(b) requires "Notification of any change in loss of entitlement to small entity status must be filed in the application . . . prior to paying, or at the time of paying . . . issue fee." From the wording of 37 C.F.R. § 1.28(b): (a) notification of change of status must be made even if the fee is paid as "other than a small entity" and (b) no notification is required if the change is to another small entity.

[ ] 37 C.F.R. § 1.492(e) and (f) (surcharge fees for filing the declaration and/or filing an English translation of an International Application later than 30 months after the priority date).

[X] Please credit any overpayments to deposit account 12-0425.

SIGNATURE OF PRACTITIONER

Reg. No.:25,858

WILLIAM R. EVANS
(type or print name of practitioner)

Tel. No.: (212)708-1930

P.O. Address

Customer No.:00140

c/o Ladas & Parry LLP
26 West 61st Street
New York, N.Y. 10023

00140
PATENT TRADEMARK OFFICE

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

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2004905024 2 September 2004 (02.09.2004) AU

(71) Applicant and
(72) Inventor: **MALANEY, Robert, Anderson** [AU/AU]; 16 Carlyle Street, East Lindfield, NSW 2070 (AU).

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

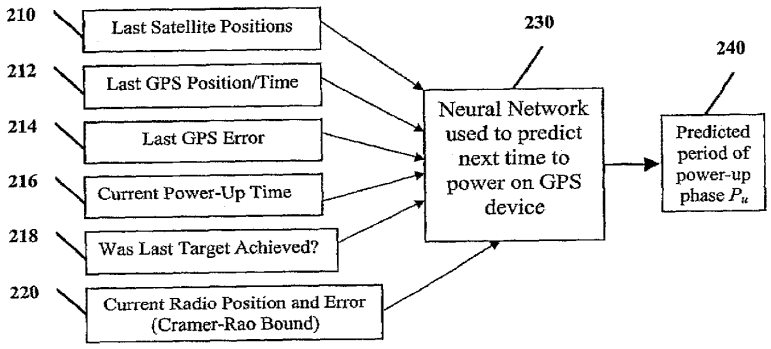
(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:
— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for all designations*
— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations*
— *of inventorship (Rule 4.17(iv)) for US only*

Published:
— *with international search report*
— *with amended claims and statement*

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

(54) **Title:** SELF MONITORING GPS ON MOBILE DEVICE



(57) **Abstract:** A method, a mobile device arid a computer program product for acquiring GPS on a mobile device possessing GPS capability are disclosed. The method comprises the step of setting a current value of the period of the power-up phase of the GPS dependent upon adaptive predictions of when the GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

WO 2006/024112 A1

SELF MONITORING GPS ON MOBILE DEVICE

FIELD OF THE INVENTION

The present invention relates generally to GPS acquisition and in particular to power conservation for GPS-enabled devices.

BACKGROUND

Techniques for the positioning of mobile devices in a wireless environment are important for a number of applications, such as emergency location services, ad hoc networks, and vehicle tracking.

In the mobile phone industry, competing technologies address the specific issues of Emergency-911 (E-911) position location. Broadly speaking, these technologies fall into two categories: (1) network-based technologies and (2) Global Positioning Systems (GPS) technologies. The network-based technologies use network-based metrics (e.g., time of flight, angle of arrival etc). The GPS technologies use line-of-sight measurements to satellites.

Network-based and GPS technologies each attempt to meet the US Federal Communications Commission (FCC) requirements for E-911 Emergency Location Services. The FCC requirements set specific statistical requirements on the position accuracy on any technology. Currently the FCC's E-911 Phase II Plans dictate that 67% of all attempts for a position location must have an accuracy of less than 50m, and 95% of calls must have an accuracy of less than 150m (Federal Communications Commission E-911 http://www.fcc.gov/911/enhanced/). Although not mandated, it is generally accepted that acquisition time of a position fix must be in a reasonably short time scale. A positioning technology that can deliver a position fix within a timescale of 30 seconds is generally considered reasonable for E-911 services, since such a small amount of time has negligible impact on the total time taken for the emergency services to reach the emergency scene.

GPS-based techniques are known to provide accurate position measurements. However, such techniques are prone to a lengthy GPS acquisition time (the length of

time taken from the time a GPS device is powered on until that device obtains a position fix). A principal reason for this is that the device does not know *a priori* which GPS satellites are currently in view and must undertake an exhaustive search to find the satellites in view. This is termed a "cold start". Generally speaking in cold start mode, a GPS device can take up to several minutes to find a location fix, which is a time-scale deemed inappropriate for many applications, such as E-911.

One simple approach to overcome this difficulty involves simply keeping the GPS device switched on at all times. After an initial fix, the satellite almanac and ephemeris data are continuously kept up-to-date, and a cold start phase can be avoided. In this mode, the GPS device is said to be in "hot start" mode. A principal disadvantage of always keeping the device in a hot-start mode is the drain on the battery resources of the mobile device. Battery power in a mobile device is a precious resource, and any steps that can be taken to maximize battery life are advantageous. Simply keeping a GPS device powered on at all times to avoid the cold start is generally considered an unacceptable solution. This is particularly the case for an application like E-911, where the GPS location finding capability is likely to be only rarely utilized.

A potential resolution to the problem of cold starts can be found in the Assisted-GPS (A-GPS) system proposed by Qualcomm; see Qualcomm White Paper, *How A-GPS Works*, 2001 (http://www.snaptrack.com/pdf/How_aGPS_works.pdf). In this system, the network "assists" the mobile device by transferring updated almanacs and ephemeris, collected by base stations, to the mobile device upon receipt of a location request. This speeds up the GPS acquisition of a mobile device relative to the acquisition from a cold start. The system also integrates network positioning information to find optimal position accuracy. However, this approach at attempting to solve the cold start problem comes at the cost of increased complexity in the network system design and incurs additional costs for the required extra infrastructure (i.e. network hardware and communications). This system is also not workable if the mobile device is disconnected from a network, but still requires a GPS position fix.

Another system attempting to address cold start is the use of periodic power-down of the GPS device. In this mode, the device is periodically switched off for a

set period. As long as the time switched off remains small, at each onset of the power-up phase, the GPS device effectively commences in hot start mode. This periodic power-down of a GPS device is termed "TricklePower" by GPS chipset manufacturers; see Laipac Technology Inc., *Reference Guideline to TF GPS,* Sept 2001, (http://www.laipac.com/datasheets/gps/TF%20GPS%20Series.pdf). In this mode, a user is allowed to set initially the power-up period, P_u. For example, setting $P_u = 30$ minutes means the GPS device powers up every 30 minutes to acquire a position fix. Once the fix is obtained (usually within seconds), the GPS device enters power-down mode.

Simply guessing what value to set P_u at is not optimal. A need clearly exists for an improved GPS acquisition system.

SUMMARY

According to an aspect of the present invention, there is provided a method of acquiring GPS on a mobile device possessing GPS capability. The method comprises the step of setting a current value of the period of the power-up phase of the GPS dependent upon adaptive predictions of when the GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

According to another aspect of the present invention, there is provided a mobile device. The mobile device comprises a processor and memory coupled to the processor; a GPS module coupled to the processor providing a GPS capability for the mobile device; and means for setting a current value of the period of the power-up phase of the GPS module dependent upon adaptive predictions of when the GPS module should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

According to yet another aspect of the present invention, there is provided a computer program product for a mobile device possessing GPS capability. The computer program product having a computer readable medium storing a computer program for acquiring GPS on the mobile device. The computer program product comprises computer program code means for interfacing with the GPS capability of the mobile device and computer program code means for setting a current value of a

period of the power-up phase of the GPS module dependent upon adaptive predictions of when the GPS module should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

According to yet another aspect of the present invention, there is provided a method of acquiring GPS on a mobile device possessing GPS capability. The method comprises the steps of using a position error between a predicted position and an actual position of the mobile device at a last position fix; if the position error is too large, adjusting a current value of the period of the power-up phase downward; if the position error is too small, adjusting the current value of the period of the power-up phase upward; estimating using a neural network a new value of the period of the power-up phase dependent upon the position error and setting a new value of the period of the power-up phase to a weighted value dependent upon an acceptable error bound.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the invention are described hereinafter by way of example with reference to the drawings, in which:

Fig. 1 is an image of a GPS-equipped mobile device with which an embodiment of the invention may be practiced;

Fig. 2 is a high-level block diagram of a system for adaptively predicting when a GPS-enable wireless communication device should be powered on in accordance with an embodiment of the invention;

Fig. 3 is a flowchart illustrating a method for determining position errors in accordance with an embodiment of the invention;

Fig. 4 is a flowchart illustrating a method of determining the value of P_u to satisfy position accuracy bounds in accordance with the embodiment of the invention;

Fig. 5 is a flowchart illustrating a method of determining the value of P_u to satisfy GPS acquisition time bounds; and

Fig. 6 is a block diagram of a general-purpose computer system with which embodiments of the invention may be practiced.

DETAILED DESCRIPTION

Methods, apparatuses, and computer program products for energy efficient GPS acquisition on a mobile device are disclosed. The acquisition meets pre-assigned statistical accuracy and acquisition time. In the following description, numerous specific details, including particular wireless networks, positioning systems, network configurations, filtering techniques, and the like are set forth. However, from this disclosure, it will be apparent to those skilled in the art that modifications and/or substitutions may be made without departing from the scope and spirit of the invention. In other circumstances, specific details may be omitted so as not to obscure the invention.

The methods may be implemented in modules. A module, and in particular its functionality, can be implemented in either hardware or software. In the software sense, a module is a process, program, or portion thereof that usually performs a particular function or related functions. Such software may be implemented in C, C++, JAVA, JAVA BEANS, Fortran, or a combination thereof, for example, but may be implemented in any of a number of other programming languages/systems, or combinations thereof. In the hardware sense, a module is a functional hardware unit designed for use with other components or modules. For example, a module may be implemented using discrete electronic components, or it may form at least a portion of an entire electronic circuit such as a Field Programmable Gate Arrays (FPGA), Application Specific Integrated Circuit (ASIC), and the like. A physical implementation may also comprise configuration data for a FPGA, or a layout for an ASIC, for example. Still further, the description of a physical implementation may be in EDIF netlisting language, structural VHDL, structural Verilog, or the like. Numerous other possibilities exist. Those skilled in the art will appreciate that the system may also be implemented as a combination of hardware and software modules.

Some portions of the following description are presented in terms of algorithms and representations of operations on data within a computer system or other device capable of performing computations. Such algorithmic descriptions and representations may be used by those skilled in the art to convey the substance of their work to others skilled in the art. An algorithm is a self-consistent sequence of steps

leading to a desired result. The steps are those requiring physical manipulations of physical quantities. Usually, though not necessarily, these quantities take the form of electrical, magnetic, or electromagnetic signals capable of being stored, transferred, combined, compared, and otherwise manipulated. These signals may be referred to as bits, values, elements, symbols, characters, terms, numbers, or the like.

The above and similar terms are to be associated with the appropriate physical quantities and are merely convenient labels applied to such quantities. Unless specifically stated otherwise, and as apparent from the following, discussions utilizing terms such as "receiving", "calculating", "predicting", "comparing", "determining", "storing", "adjusting", "using", "estimating", "setting" or the like, refer to the action and processes of a computer system, or a similar electronic device. Such a system or device manipulates and transforms data represented as physical quantities within the registers and memories of the computer system into other data similarly represented as physical quantities within the computer system registers, memories, or another form of storage, transmission or display devices.

Apparatuses and systems for performing the operations of the methods are also described. Such an apparatus may be specifically constructed for the required purpose. Alternatively, the apparatus may comprise a general-purpose computer (e.g., a notebook PC) or another computing device (e.g., a PDA), which may be selectively activated or reconfigured by a computer program read by the computer. The algorithms presented herein are not inherently related to any particular computer or other apparatus; various general-purpose machines may be used with programs.

The embodiments of the invention also relate to a computer program(s) or software, in which method steps may be put into effect by computer code. The computer program is not intended to be limited to any particular programming language, operating environment, and implementation thereof. A variety of programming languages, operating systems, and coding thereof may be used. Moreover, the computer program is not intended to be limited to any particular control flow. There are many other variants of the computer program, which can use different control flows without departing the scope and spirit of the invention.

Furthermore, one or more of the steps of the computer program may be performed in parallel rather than sequentially.

The computer program may be stored on any computer readable medium. The computer readable medium may comprise storage devices, such as magnetic media disks, CD-ROMs, DVDs, flash RAM devices, memory chips, memory cards, magnetic tape, other storage devices and media suitable for interfacing with and being read by a general-purpose computer, and combinations thereof. The computer readable medium may also include a hard-wired medium, such as a local area network or the Internet, or wireless medium, such as an IEEE 802.11 wireless network, BlueTooth, a GSM mobile telephone system, PCS, and GPS. The computer program when loaded and executed on such a general-purpose computer effectively results in an apparatus that implements the method steps of the embodiments.

The methods of the embodiments comprise particular control flows. However, different control flows can be practiced without departing from the scope and spirit of the invention.

I. Introduction

Hereinafter, the next "power-up time" means the time derived by adding the current value of P_u to the time at which a power down occurs. The embodiments of the invention systematically set the period of the power-up phase, P_u, whilst retaining the accuracy of the position fix and the acquisition times of the position fix within acceptable bounds.

Adaptive predictions are made of when a GPS device, embedded in a wireless communication device, should be powered on to meet specifications on positioning accuracy and GPS acquisition time. The embodiments of the invention address the issue of setting the period of the power-up phase, P_u, whilst retaining the accuracy of the position fix and the acquisition times of the position fix within acceptable bounds. Simply setting P_u to some value at the onset of operation may provide the required bounds for some time epoch, but there is no guarantee that this will also be the case in the future. Also, this simple approach provides no sense of an optimized value of P_u.

By this, what is meant is the maximum value of P_u allowable whilst still retaining the accuracy of the position fix and the acquisition times of the position fix within acceptable bounds. An example of an inefficient system design would be a GPS system reporting positions every second when an acceptable error bound (accuracy) of 50 meters was required on a device moving at 1 meter per second. The embodiments of the invention allow a GPS device to determine dynamically an optimal P_u in response to such a circumstance.

The methods and apparatuses in accordance with embodiments of the invention address these issues, using adaptive-filter and machine-learning techniques within the mobile device. These techniques allow the mobile device to self monitor the predicted accuracy error and the predicted acquisition times of the GPS device. If these predicted values fail to meet acceptable bounds, the value of P_u is reduced. If the predicted values meet the acceptable bounds, the value of P_u is increased. The embodiments of the invention provide a technology referred to hereinafter as Self Monitored (SM) – GPS. Although applicable to E-911 services, SM-GPS is equally applicable to any mobile GPS device. SM-GPS allows such a device to operate in the most energy efficient way whilst still retaining the position accuracy and acquisition times deemed appropriate by the operator of the GPS device.

The embodiments of the invention assist a mobile device in GPS position acquisition in the most energy efficient way, whilst still retaining the position accuracy and acquisition times deemed appropriate by the operator of the GPS device. In this context, "mobile device" means a power limited (*e.g.* battery operated) device possessing embedded GPS capability. Examples of such devices are GPS-capable mobile telephones, laptop computers, Personal Digital Assistants (PDAs), and wireless sensor devices, to name a few.

II. Device & Software to Self-Monitor Power of Power-Up Phase

In one embodiment, software is embedded in a mobile device to self-monitor the period of the power-up phase, P_u for the device, and to self-adjust the value of P_u if P_u is inconsistent with maximally conserving the battery power of the mobile

device. Fig. 1 shows such a GPS-equipped mobile device 100. The GPS- equipped mobile device may be, for example, a Compaq ® iPAQ ® PDA with a GPS adaptor connected to the PDA. Software embodying a method to self-monitor the period of the power-up phase is used in the PDA to implement this embodiment.

The embodiments of the invention involve the determination of the error between the predicted position of the mobile device and that of the actual position reported by its GPS. Given a past history of N reported positions, prediction techniques can be used to predict the position of the device at some time t later (the next power-up phase). The value N is determined *a priori*, usually based on experience of testing of a particular adaptive learning algorithm. In an embodiment of the invention, an adaptive filter technique based on neural networks is used for the position prediction. The difference between this predicted position and the actual position measured at time t can be used to formulate the position error. After forming this position error, the values of the position, the position error, and the value of P_u used at the time of the actual position measurement are stored in the mobile device's memory. In addition, acquisition time dt_a may be stored.

Fig. 2 is a block diagram of the system 200 that may be implemented using the PDA of Fig. 1. The system 200 comprises a neural network module 230 that receives various inputs 210-220 to produce a predicted period of the power-up phase P_u 240. The neural network module 230 predicts the next time to power on the GPS device. This module 230 does so dependent upon various inputs including the last satellite positions 210, the last GPS position/time 212, the last GPS error 214, the current power-up time 216, information about whether or not the last target (i.e. were the accuracy requirements satisfied or not) was achieved, and the current radio position and error 220. The latter information 220 may be determined using Cramer-Rao bounds. Further details of the neural network 200 are set forth hereinafter.

A flow chart of a method 300 to determine and store P_u, dt_u, and e_p is depicted in Fig. 3. Processing commences in step 310 in which the last N positions reported are used to predict the next position at the next scheduled power-up time. That is, given the past position history stored in the mobile device, an adaptive algorithm predicts the next position value. A number of techniques are known for predicting the

next position of a mobile device based on its past history of positions, such as regression, Kalman filter, particle filter. In step 320, at the next power-up time, the predicted position of the GPS-enabled mobile device is compared with the actual position of the mobile device, and the position error e_p is determined. Thus, given a predicted value of the position, the predicted value is checked against the actual position location reported the next time the GPS device is powered on to form the prediction error e_p. In step 330, the current values of the period of the power-up phase P_u, acquisition time dt_a, and prediction error e_p are stored. This information may be stored in the memory of the wireless device or other suitable storage device. Processing then terminates. The mobile device itself can time how long it took (from the onset of power up) to obtain a GPS fix - this is the acquisition time. If GPS position is unavailable at a particular epoch, nothing is recorded.

The foregoing method uses the stored position error values e_p to determine how best to set the value of P_u given an acceptable error bound a_c. A system can thus be designed that adaptively determines the best functional fit to the function $P_u(e_p)$. In one embodiment, a technique based on neural networks 200 can be used for the determination of $P_u(e_p)$. Given the current best estimate of this function and the acceptable error bound a_c, the value of P_u can be then set using $P_u(a_c)$. In addition, a weighted contribution of $P_u(a_c)$ can be allowed for to be used in setting the new power-up period. A separate algorithm checks whether the current power-up period is too large or too small, and if so adjusts P_u accordingly. The new power-up period can then be set as $wP_u + P_u(a_c)$, where w is a weighting factor in the range 0-1.

Fig. 4 is a flow diagram of a method 400 for adjusting the value of P_u and setting a new power-up period to deliver SM-GPS to mobile devices. Following on from steps described in Fig. 3, the method 400 commences in step 410. In step 410, the stored position error value e_p, determined from the last position fix, is read. In decision step 412, a check is made to determine if the stored position error value e_p is too large. In one embodiment, the term "too large" means that e_p is larger than a_c.

Variations on this in terms some fraction or multiple of a_c can also be used. If decision step 412 returns true (Yes), processing continues at step 414. In step 414, the current values of the period of the power-up phase P_u is adjusted down. In one embodiment, the new value may be adjusted to cP_u, where c is set at 0.5. Again, different values of c or different reduction algorithms may be practiced. The new power-up period has a minimum threshold value below which the power-up period cannot be set. This threshold value may be one second - which is the period set in the default TricklePower mode of many GPS chipsets. However, other threshold values may be specified. Processing continues from step 414 at step 422. Otherwise, if decision step 412 returns false (No), processing continues at step 416.

In decision step 416, a check is made to determine if the stored position error values e_p is too small. In one embodiment, the term "too small" means e_p is smaller than $0.5a_c$. However, variations on this in terms of some other fraction of a_c can also be used. If decision step 416 returns true (Yes), processing continues at step 418. In step 418, the current value of the power-up period P_u is adjusted upwards. That is, the value of P_u is increased to a new value. The new value may be calculated as bP_u, where b is set at 1.5. Once again, different values of b or different increase algorithms may be practiced. The new power-up period has a maximum threshold value below which it cannot be set. This threshold value may be ten minutes, for example, but this can be set by the user *a priori*. From step 418, processing continues at step 422. If decision step 416 returns false (No), processing continues at step 420.

In step 420, the current value of the power-up period P_u is not changed, that is, it is maintained at the same value. Processing then continues at step 422. In step 422, the new power-up period is set to $wP_u + (1-w)P_u(a_c)$. In step 424, a neural network estimate of $P_u(e_p)$ is provided to step 422. That is, separate from the above steps, a neural network 200 estimate of the function $P_u(e_p)$ is made based on the stored values of P_u and e_p. A weighted average of these two independent values may be used to set the final new power-up period as $wP_u + (1-w)P_u(a_c)$, where a_c is again the acceptable error bound on the position. The value of weighting parameter w is set

a priori by the manufacturer or user. In a variant of this process, w can be made time dependent. From step 422, processing terminates.

If position accuracy is the sole criteria dictating the value of P_u, the above process would suffice. However, if the acquisition time is the sole criteria dictating the value of P_u, the process 500 depicted in the flowchart described in Fig. 5 would suffice. This process 500 is similar to that 400 given above, except that the acquisition time dt_p is used to determine the new power-up period. It is the comparison of dt_p with the pre-assigned value for the bound on acquisition time that is used in decision making process. In step 510, the stored acquisition time dt_p is used to determine the last position fix. In decision step 512, a check is made to determine if the stored acquisition time dt_p is too large. In Fig. 5, a_c is now the acceptable error on acquisition time. The term "too large" means that dt_a is larger than a_c. Variations on this in terms of some fraction or multiple of a_c can also be used. If decision step 512 returns true (Yes), processing continues at step 514. In step 514, the current values of P_u is adjusted down. Thus, if dt_a is too large, the value of P_u is reduced to a new value. The new value may be set to cP_u, where c is set at 0.5. Different values of c or different reduction algorithms may be used. Again, a minimum value of the power-up period is imposed. Processing continues from step 514 at step 522. Otherwise, if decision step 512 returns false (No), processing continues at step 516.

In decision step 516, a check is made to determine if the stored acquisition time dt_p is too small. The term "too small" means that dt_a is smaller than $0.5\,a_c$. Variations on this in terms of some other fraction of a_c can also be used. If decision step 516 returns true (Yes); processing continues at step 518. In step 518, the current value of P_u is adjusted upwards. Thus, if dt_a is too small, the value of P_u is increased to a new value. The new value of the power-up period may be set to bP_u, where b is set at 1.5. Different values of b or different increase algorithms may be used. Again a maximum value of the power-up period is imposed. From step 518, processing

continues at step 522. If decision step 516 returns false (No), processing continues at step 520.

In step 520, the current value of the power-up period P_u is not changed, that is, it is maintained at the same value. Processing then continues at step 522. In step 522, the new power-up period is set to $wP_u + (1-w)P_u(a_c)$. In step 524, a neural network estimate of $P_u(dt_p)$ is provided to step 522. A weighted average of these two independent values is then used to set the final new power-up period as $wP_u + (1-w)P_u(a_c)$, where a_c is again the acceptable error bound on the acquisition time. The value of w is set *a priori* by the manufacturer or user. In a variant of this process w can be made time dependent. That is, separate from the above steps, a neural network 200 estimate of the function $P_u(dt_p)$ is made based on the stored values of P_u and dt_p. From step 522, processing terminates.

In the event that both the position accuracy and the acquisition time are to be considered in dictating the new value of the power-up period, both algorithms shown in Figs. 4 and 5 may be run simultaneously and independently. The smaller of the two new values of the power-up period reported by the algorithms may be utilized as the final new value.

As used by an E-911 application, the mobile device can automatically power-up the GPS device and determine its current position, if the GPS is available at that particular time. Due the SM-GPS algorithm described hereinbefore, cold start of the GPS device should be avoided. If for some reason the GPS is unavailable (*e.g.* by non-line of sight effects) when an emergency position request is made, the mobile device can report the GPS position predicted at the last power-up phase. This has the advantage over A-GPS that no added network infrastructure is required, and an estimate of the mobile device's current position is given even if the GPS suddenly became unavailable.

In the context of continuous position requests, such as in a tracking application, the SM-GPS algorithm adaptively alters the power-up period to find the largest value of P_u at that particular epoch that is consistent with the required accuracy and acquisition time bounds. This has an advantage relative to current

systems that the user of the device does not have to estimate and manually enter such a value *a priori*. This also has the advantage of self-adjusting the value of P_u to changing conditions.

III. Neural Networks

The adaptive prediction algorithm used for predicting positions and within the SM-GPS is similar to a Time Delay Neural Network (TDNN). Such networks are neural networks that have a special topology used for position-independent recognition of features within a larger pattern. These types of networks have been successfully used in applications such as speech prediction algorithms and stock predictions. Flexibility in the architectural design of these networks allows them to handle any complex nonlinear behavior as well as more simple linear behavior. A TDNN with just one neuron and a linear transfer function can be trained to operate as an effective linear adaptive filter.

The details of TDNNs, how they operate and the different architectures possible (*e.g.* learning strategies, transfer functions, number of layers, weights) have been well documented in the literature. For example, see Simon Haykin, *Neural Networks: A comprehensive foundation*, MacMillan, New York, 1994. In one embodiment, the previous positions are used to form the input vectors of the neural network and the output is the predicted position.

Other neural network are constructed to optimally find the functions $P_u(e_p)$ and $P_u(dt_a)$ in Figs. 4 and 5, respectively. These are referred to as "function discovery" neural networks. Again these networks are adaptive, in the sense that the functional forms $P_u(e_p)$ and $P_u(dt_a)$ do not remain constant in time.

To accommodate various forms of relationships between the input vectors and the output in a neural network, Multi-Layer Perceptron (MLP) models are used. These types of models can be applied to both the TDNN networks and the function discovery neural networks. MLP models typically have an input vector of length r and a hidden layer of s neurons. A matrix of weights $\alpha_{s,r}$ describes the relationship between the input vectors and the layer of neurons. Various transfer function can be

deployed such as a log-sigmiod transfer function. In general, the number of hidden layers can be increased to accommodate even more complex systems. In one embodiment, an MLP network that is adopted involves one hidden layer and a number of neurons equal to the size of the input vector. A log-sigmoid transfer function is adopted. For TDNN, the weights associated with the neural network adapt to the newly predicted position and its subsequent measurement of the actual position to minimize future prediction errors. By this mechanism, the network adapts and "learns" the optimal weight $\alpha_{s,r}$ settings relevant to that particular epoch.

For the function discovery neural networks, the weights associated with the neural networks adapt to the newly predicted functional form of the functions ($P_u(e_p)$ and $P_u(dt_a)$ of Figs. 4 and 5, respectively, based on the incoming new data. This means that the neural networks are constantly re-training themselves.

IV. Other Embodiments & Variations

The adaptive learning algorithms can be embedded on a signal processing chip in a mobile device. For additional power savings, the neural network calculations may be passed to some external processing unit within the network, if the mobile device is in communication with a larger network, e.g. a wireless network. The value of the power-up period calculated by the external device may then be passed back to the mobile device.

In the event of a GPS signal being unavailable, the position error and acquisition time are not defined for that time. As this could be an indication that the user is in an area where reception of the GPS satellite signals is poor, one may wish not to decrease the power-up period, or at least to limit the decrease. In this way additional energy sources are not used in a vain attempt at acquiring a GPS signal.

There are many neural network architectures that could be deployed in the algorithms of Figs. 2, 4 and 5. For example, the predicted position can also be a function of the actual P_u being used (in general shorter values of P_u have smaller errors). A neural network can be invoked in which the past history of P_u is also an input to the neural network. Radial basis function networks could also be deployed in

the estimates of the functions $P_u(e_p)$ and $P_u(dt_a)$. A thorough discussion of neural network architectures can be found in standard texts. Again, see for example Simon Haykin, *Neural Networks: A comprehensive foundation*, MacMillan, New York, 1994.

VI. Other Embodiments & Variations

The methods according to the embodiments of the invention may be practiced using one or more general-purpose computer systems, handheld devices, cellular phone, and other suitable mobile computing devices, in which the processes described with reference to Figs. 1-5 may be implemented as software, such as an application program executing within the computer system or a handheld device. In particular, instructions in the software that are carried out by the computer effect the steps in the method, at least in part. Software may include one or more computer programs, including application programs, an operating system, procedures, rules, data structures, and data. The instructions may be formed as one or more code modules, each for performing one or more particular tasks. The software may be stored in a computer readable medium, comprising one or more of the storage devices described below, for example. The computer system loads the software from the computer readable medium and then executes the software. Fig. 6 depicts an example of a computer system 600 with which the embodiments of the invention may be practiced. A computer readable medium having such software recorded on the medium is a computer program product. The use of the computer program product in the computer system may effect an advantageous apparatus in accordance with the embodiments of the invention.

Fig. 6 illustrates the computer system 600 in block diagram form, coupled to a wireless network 620. An operator may use the keyboard 630 and/or a pointing device such as the mouse 632 (or touchpad, for example) to provide input to the computer 650. The computer system 600 may have any of a number of output devices, including line printers, laser printers, plotters, and other reproduction devices connected to the computer. The computer system 600 can be connected to one or more other computers via a communication interface 664 using an appropriate

communication channel 640. The computer network 620 may comprise a wireless local area network (WLAN), or a 3G network, for example. While not depicted in Fig. 6 to simplify the drawing, it will be readily appreciated by those skilled in the art that the computer system 600 may be equipped with a GPS module, for example, in the manner shown in Fig. 1.

The computer 650 may comprise a processing unit 666 (e.g., one or more central processing units) 666, memory 670 which may comprise random access memory (RAM), read-only memory (ROM), or a combination of the two, input/output (IO) interfaces672, a graphics interface 660, and one or more storage devices 662. The storage device(s) 662 may comprise one or more of the following: a floppy disc, a hard disc drive, a magneto-optical disc drive, CD-ROM, DVD, a data card or memory stick, flash RAM device, magnetic tape or any other of a number of non-volatile storage devices well known to those skilled in the art. While the storage device is shown directly connected to the bus in Fig. 6, such a storage device may be connected through any suitable interface, such as a parallel port, serial port, USB interface, a Firewire interface, a wireless interface, a PCMCIA slot, or the like. For the purposes of this description, a storage unit may comprise one or more of the memory 670 and the storage devices 662 (as indicated by a dashed box surrounding these elements in Fig. 6).

Each of the components of the computer 650 is typically connected to one or more of the other devices via one or more buses 680, depicted generally in Fig. 6, that in turn comprise data, address, and control buses. While a single bus 680 is depicted in Fig. 6, it will be well understood by those skilled in the art that a computer or other electronic computing device, such as a PDA, may have several buses including one or more of a processor bus, a memory bus, a graphics card bus, and a peripheral bus. Suitable bridges may be utilized to interface communications between such buses. While a system using a CPU has been described, it will be appreciated by those skilled in the art that other processing units capable of processing data and carrying out operations may be used instead without departing from the scope and spirit of the invention.

The computer system 600 is simply provided for illustrative purposes, and other configurations can be employed without departing from the scope and spirit of the invention. Computers with which the embodiment can be practiced comprise IBM-PC/ATs or compatibles, laptop/notebook computers, one of the Macintosh (TM) family of PCs, Sun Sparcstation (TM), a PDA, a workstation or the like. The foregoing are merely examples of the types of devices with which the embodiments of the invention may be practiced. Typically, the processes of the embodiments, described hereinafter, are resident as software or a program recorded on a hard disk drive as the computer readable medium, and read and controlled using the processor. Intermediate storage of the program and intermediate data and any data fetched from the network may be accomplished using the semiconductor memory.

In some instances, the program may be supplied encoded on a CD-ROM or a floppy disk, or alternatively could be read from a network via a modem device connected to the computer, for example. Still further, the software can also be loaded into the computer system from other computer readable medium comprising magnetic tape, a ROM or integrated circuit, a magneto-optical disk, a radio or infra-red transmission channel between the computer and another device, a computer readable card such as a PCMCIA card, and the Internet and Intranets comprising email transmissions and information recorded on websites and the like. The foregoing is merely an example of relevant computer readable mediums. Other computer readable mediums may be practiced without departing from the scope and spirit of the invention.

A small number of embodiments of the invention regarding methods, systems, and computer program products for energy efficient GPS acquisition on a mobile device have been described. In the light of the foregoing, it will be apparent to those skilled in the art in the light of this disclosure that various modifications and/or substitutions may be made without departing from the scope and spirit of the invention.

CLAIMS

The claims defining the invention are as follows:-

1. A method of acquiring GPS on a mobile device possessing GPS capability, said method comprising the step of:

setting a current value of the period of the power-up phase of said GPS dependent upon adaptive predictions of when said GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

2. The method according to claim 1, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable bounds.

3. The method according to claim 1, wherein said mobile device determines dynamically an optimal period of the power-up phase.

4. The method according to claim 1, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

5. The method according to claim 4, wherein said adaptive-filter and machine learning techniques are implemented using said mobile device.

6. The method according to claim 1, wherein said setting step comprises:

if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

if at least one of predicted accuracy error and predicted acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

7. The method according to claim 1, wherein said mobile device comprises a power limited device.

8. The method according to claim 1, wherein said mobile device comprises an embedded GPS device.

9. The method according to claim 1, comprising the step of making adaptive predictions using a neural network.

10. The method according to claim 1, wherein said setting step comprises:

predicting a next position a next scheduled power-up time using a number of last positions reported;

comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

storing current values of period of the power-up phase, acquisition time, position error and position in a storage unit of said mobile device.

11. A mobile device, comprising:

a processor and memory coupled to said processor;

a GPS module coupled to said processor providing a GPS capability for said mobile device; and

means for setting a current value of the period of the power-up phase of said GPS module dependent upon adaptive predictions of when said GPS module should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

12. The mobile device according to claim 11, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable bounds.

13. The mobile device according to claim 11, wherein said mobile device determines dynamically an optimal period of the power-up phase.

14. The mobile device according to claim 11, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

15. The mobile device according to claim 14, wherein said adaptive-filter and machine –learning techniques are implemented using said mobile device.

16. The mobile device according to claim 11, wherein said setting means comprises:

means for, if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

means for, if at least one of predicted accuracy error and predicted acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

17. The mobile device according to claim 11, wherein said mobile device comprises a power limited device.

18. The mobile device according to claim 17, wherein said mobile device comprises a battery for powering said mobile device.

19. The mobile device according to claim 11, comprising a neural network module for making adaptive predictions.

20. The mobile device according to claim 11, wherein said setting means comprises:

means for predicting a next position a next scheduled power-up time using a

number of last positions reported;

means for comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

means for storing current values of a period of the power-up phase, acquisition time, position error and position in a storage unit of said mobile device.

21. A computer program product for a mobile device possessing GPS capability, said computer program product having a computer readable medium storing a computer program for acquiring GPS on said mobile device, comprising:

computer program code means for interfacing with the GPS capability of said mobile device; and

computer program code means for setting a current value of a period of the power-up phase of said GPS module dependent upon adaptive predictions of when said GPS module should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

22. The computer program product according to claim 21, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable bounds.

23. The computer program product according to claim 21, wherein said computer program product determines dynamically an optimal period of the power-up phase.

24. The computer program product according to claim 21, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

25. The computer program product according to claim 24, wherein said adaptive-filter and machine learning techniques are implemented using said mobile device

26. The computer program product according to claim 21, wherein said computer program code means for setting comprises:

computer program code means for, if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

computer program code means for, if at least one of predicted accuracy error and predicted acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

27. The computer program product according to claim 21, wherein said mobile device comprises a power limited device.

28. The computer program product according to claim 27, wherein said mobile device comprises a battery for powering said mobile device.

29. The computer program product according to claim 21, comprising computer program code means for providing a neural network module to make adaptive predictions.

30. The computer program product according to claim 21, wherein said computer program code means for setting comprises:

computer program code means for predicting a next position a next scheduled power-up time using a number of last positions reported;

computer program code means for comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

computer program code means for storing current values of a period of the power-up phase, acquisition time, position error and position in a storage unit of said mobile device.

31. A method of acquiring GPS on a mobile device possessing GPS capability, said method comprising the steps of:

using a position error between a predicted position and an actual position of said mobile device at a last position fix;

if the position error is too large, adjusting a current value of the period of the power-up phase downward;

if the position error is too small, adjusting the current value of said period of the power-up phase upward;

estimating using a neural network a new value of said period of the power-up phase dependent upon said position error; and

setting a new value of said period of the power-up phase to a weighted value dependent upon an acceptable error bound.

32. A method of acquiring GPS on a mobile device possessing GPS capability, said method comprising the steps of:

using an acquisition time at a last position fix;

if the acquisition time is too large, adjusting a current value of the period of the power-up phase downward;

if the acquisition time is too small, adjusting the current value of said period of the power-up phase upward;

estimating using a neural network a new value of said period of the power-up phase dependent upon said acquisition time; and

setting a new value of said period of the power-up phase to a weighted value dependent upon an acceptable bound.

33. A method of acquiring GPS on a mobile device possessing GPS capability, said method being substantially as hereinbefore disclosed with reference to any one of the embodiments shown in Figs. 1 to 6 of the accompanying drawings.

34. A mobile device, said mobile device being substantially as hereinbefore disclosed with reference to any one of the embodiments shown in Figs. 1 to 6 of the accompanying drawings.

35. A computer program product for a mobile device possessing GPS capability, said computer program product being substantially as hereinbefore disclosed with reference to any one of the embodiments shown in Figs. 1 to 6 of the accompanying drawings.

36. A method of acquiring GPS on a mobile device possessing GPS capability, said method being substantially as hereinbefore disclosed with reference to any one of the embodiments shown in Figs. 1 to 6 of the accompanying drawings.

AMENDED CLAIMS
[received by the International Bureau on 14 November 2005 (14.11.05); original claims 1-36 replaced by amended claims 1-36 (7 pages)]

CLAIMS

The claims defining the invention are as follows:-

1. A method of acquiring GPS on a mobile device possessing GPS capability, said method comprising the step of:

setting a current value of the period of the power-up phase of said GPS dependent upon Cramer-Rao Bound information on the independent wireless radio position, and adaptive predictions of when said GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time, when said specifications are statistical bounds.

2. The method according to claim 1, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable statistical bounds.

3. The method according to claim 1, wherein said mobile device determines dynamically an optimal period of the power-up phase.

4. The method according to claim 1, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

5. The method according to claim 4, wherein said adaptive-filter and machine learning techniques are implemented using said mobile device.

6. The method according to claim 1, wherein said setting step comprises:

if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

if at least one of predicted accuracy error and predicted acquisition times of

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GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

7. The method according to claim 1, wherein said mobile device comprises a power limited device.

8. The method according to claim 1, wherein said mobile device comprises an embedded GPS device.

9. The method according to claim 1, comprising the step of making adaptive predictions using a neural network.

10. The method according to claim 1, wherein said setting step comprises:

predicting a next position a next scheduled power-up time using a number of last positions reported;

comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

storing current values of period of the power-up phase, acquisition time, position error and position in a storage unit of said mobile device.

11. A mobile device, comprising:

a processor and memory coupled to said processor;

a GPS module coupled to said processor providing a GPS capability for said mobile device; and

means for setting a current value of the period of the power-up phase of said GPS module dependent upon Cramer-Rao Bound information on the independent wireless radio position, and adaptive predictions of when said GPS module should be powered on to meet specifications on positioning accuracy and GPS acquisition time, when said specifications are statistical bounds.

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12. The mobile device according to claim 11, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable bounds.

13. The mobile device according to claim 11, wherein said mobile device determines dynamically an optimal period of the power-up phase.

14. The mobile device according to claim 11, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

15. The mobile device according to claim 14, wherein said adaptive-filter and machine –learning techniques are implemented using said mobile device.

16. The mobile device according to claim 11, wherein said setting means comprises:

means for, if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

means for, if at least one of predicted accuracy error and predicted acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

17. The mobile device according to claim 11, wherein said mobile device comprises a power limited device.

18. The mobile device according to claim 17, wherein said mobile device comprises a battery for powering said mobile device.

19. The mobile device according to claim 11, comprising a neural network module for making adaptive predictions.

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20. The mobile device according to claim 11, wherein said setting means comprises:

means for predicting a next position a next scheduled power-up time using a number of last positions reported;

means for comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

means for storing current values of a period of the power-up phase, acquisition time, position error and position in a storage unit of said mobile device.

21. A computer program product for a mobile device possessing GPS capability, said computer program product having a computer readable medium storing a computer program for acquiring GPS on said mobile device, comprising:

computer program code means for interfacing with the GPS capability of said mobile device; and

computer program code means for setting a current value of a period of the power-up phase of said GPS module dependent upon Cramer-Rao Bound information on the independent wireless radio position, and adaptive predictions of when said GPS module should be powered on to meet specifications on positioning accuracy and GPS acquisition time, when said specifications are statistical bounds.

22. The computer program product according to claim 21, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable bounds.

23. The computer program product according to claim 21, wherein said computer program product determines dynamically an optimal period of the power-up phase.

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24. The computer program product according to claim 21, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

25. The computer program product according to claim 24, wherein said adaptive-filter and machine learning techniques are implemented using said mobile device

26. The computer program product according to claim 21, wherein said computer program code means for setting comprises:

computer program code means for, if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

computer program code means for, if at least one of predicted accuracy error and predicted acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

27. The computer program product according to claim 21, wherein said mobile device comprises a power limited device.

28. The computer program product according to claim 27, wherein said mobile device comprises a battery for powering said mobile device.

29. The computer program product according to claim 21, comprising computer program code means for providing a neural network module to make adaptive predictions.

30. The computer program product according to claim 21, wherein said computer program code means for setting comprises:

computer program code means for predicting a next position a next scheduled power-up time using a number of last positions reported;

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computer program code means for comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

computer program code means for storing current values of a period of the power-up phase, acquisition time, position error and position in a storage unit of said mobile device.

31. A method of acquiring GPS on a mobile device possessing GPS capability, said method comprising the steps of:

using a position error between a predicted position and an actual position of said mobile device at a last position fix;

if the position error is too large, adjusting a current value of the period of the power-up phase downward;

if the position error is too small, adjusting the current value of said period of the power-up phase upward;

estimating using a neural network a new value of said period of the power-up phase dependent upon said position error; and

setting a new value of said period of the power-up phase to a weighted value dependent upon an acceptable error bound.

32. A method of acquiring GPS on a mobile device possessing GPS capability, said method comprising the steps of:

using an acquisition time at a last position fix;

if the acquisition time is too large, adjusting a current value of the period of the power-up phase downward;

if the acquisition time is too small, adjusting the current value of said period of the power-up phase upward;

estimating using a neural network a new value of said period of the power-up phase dependent upon said acquisition time; and

setting a new value of said period of the power-up phase to a weighted value dependent upon an acceptable bound.

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33. A method of acquiring GPS on a mobile device possessing GPS capability, said method being substantially as hereinbefore disclosed with reference to any one of the embodiments shown in Figs. 1 to 6 of the accompanying drawings.

34. A mobile device, said mobile device being substantially as hereinbefore disclosed with reference to any one of the embodiments shown in Figs. 1 to 6 of the accompanying drawings.

35. A computer program product for a mobile device possessing GPS capability, said computer program product being substantially as hereinbefore disclosed with reference to any one of the embodiments shown in Figs. 1 to 6 of the accompanying drawings.

36. A method of acquiring GPS on a mobile device possessing GPS capability, said method being substantially as hereinbefore disclosed with reference to any one of the embodiments shown in Figs. 1 to 6 of the accompanying drawings.

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This is a statement accompanying the amendments to the original claims of the PCT application PCT/AU2005/001351. Claims 1, 11 and 21 have been amended to include "Cramer-Rao Bound information on the independent wireless radio position" as this is a step in the disclosure (Fig 2). Claims 1, 11 and 21 have also been amended with the additional statement of "when said specifications are statistical bounds", as statistical bounds are different entities than non-statistical (deterministic) bounds. Statistical bounds are disclosed as those necessary for compliance with US Federal Communications Commission requirements for E-911 services. All other claims are based on claims 1, 11, and 21.

As disclosed in the application, the aim of the invention is to determine the *optimal* value of the power-up period. The invention is motivated by the desire to minimize GPS power usage whilst meeting stated requirements of E-911 services. These requirements are statistical not deterministic. The cited prior art does not disclose any method that will determine or predict the *optimal* power-up period required to meet statistical bound requirements, nor do they include optimal position information (that is the Cramer Rao Bounds on range or position) available from any independent wireless position system (say the wireless network the device is using for communications). Two examples can be used to illustrate the importance of Cramer-Rao Bounds, and the requirement of statistical bounds.

i) An optimal power-up period based on statistical bounds can be very different than the power-up period derived from deterministic bounds. If deterministic bounds are used, in one step of the process the power up-period could be set so as to satisfy a deterministic accuracy bound of say 50m. If this 50m bound is not met, prior art dictates that the power-up period be shortened to some undisclosed new value. It could well be the case, however, that even if the power-up period was not shortened, in the next step of the process the 50m accuracy was in fact achieved. This could happen with say 50% probability. If the accuracy bounds considered were a statistical bound stated as "50% of measurements must be within 50m," for example, the power-up period need not be adjusted. This would represent substantial power savings. The disclosed invention PCT/AU2005/001351 applies a neural network calculation with previous values of the power-up period as inputs, and statistical bounds as constrained outputs. It thus sets out a novel method to determine in an optimal fashion the specific value of the power-up period required to meet statistical bounds.

ii) In PCT/AU2005/001351 use of Cramer-Rao Bounds on independent (non-GPS) radio positions is considered as part of the inputs to the neural network calculation. Cramer-Rao Bounds on position, or ranges (from say a base station), represent optimal statistical bounds on the variance of metrics related to position information. If these variances show that the radio position error will meet statistical requirements, say less than 50m 50% of the time, then there will never be any requirement to power on GPS to meet said statistical requirements. The neural network will set the power-up period to an infinite value. This represents significant savings compared to methods disclosed in any prior art cited.

The amended claims attempt to distinguish the novelty and inventive steps disclosed in PCT/AU2005/001351. The use of machine learning algorithms, which use as inputs historical values of the power-up period and Cramer-Rao Bound information on radio positions, to determine an optimal value of a power-up period, is not disclosed in any prior art. In a wide range of circumstances, the power savings obtained from methods disclosed in the cited prior art, will be significantly less than the power savings obtained from the methods disclosed in PCT/AU2005/001351.

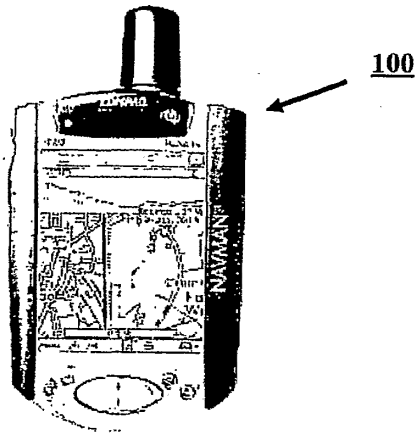


FIG. 1

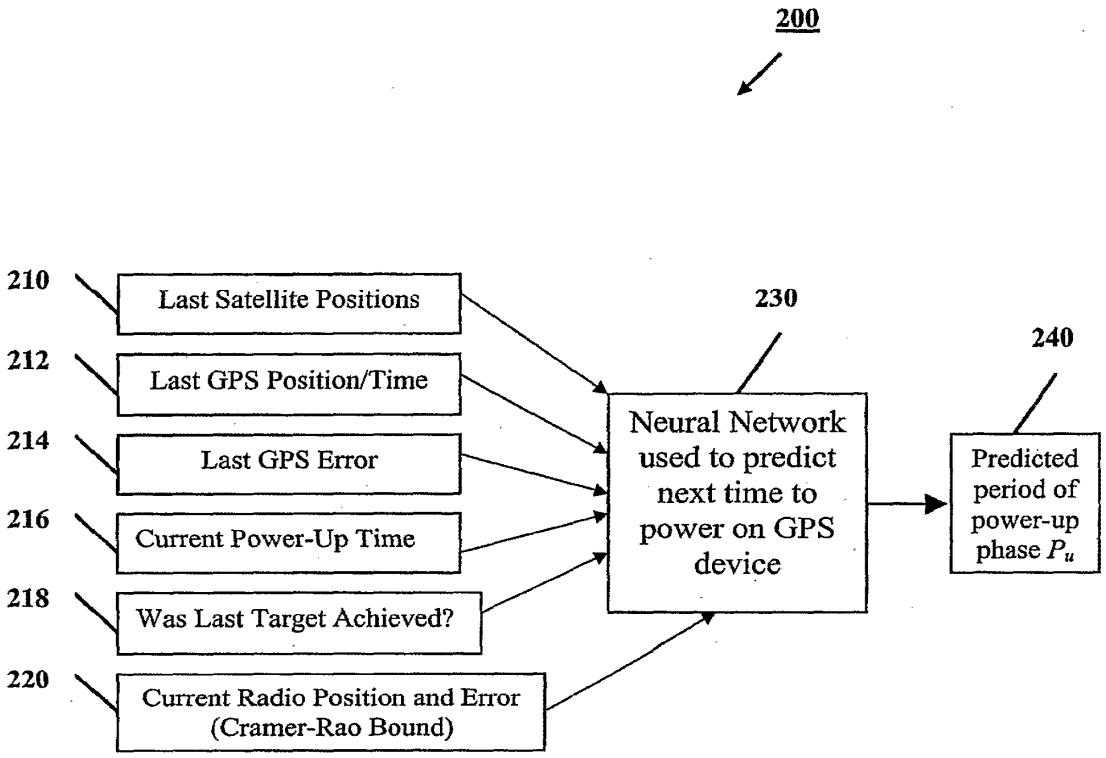

200
210
Last Satellite Positions
212
Last GPS Position/Time
214
Last GPS Error
216
Current Power-Up Time
218
Was Last Target Achieved?
220
Current Radio Position and Error (Cramer-Rao Bound)
230
Neural Network used to predict next time to power on GPS device
240
Predicted period of power-up phase P_u

FIG. 2

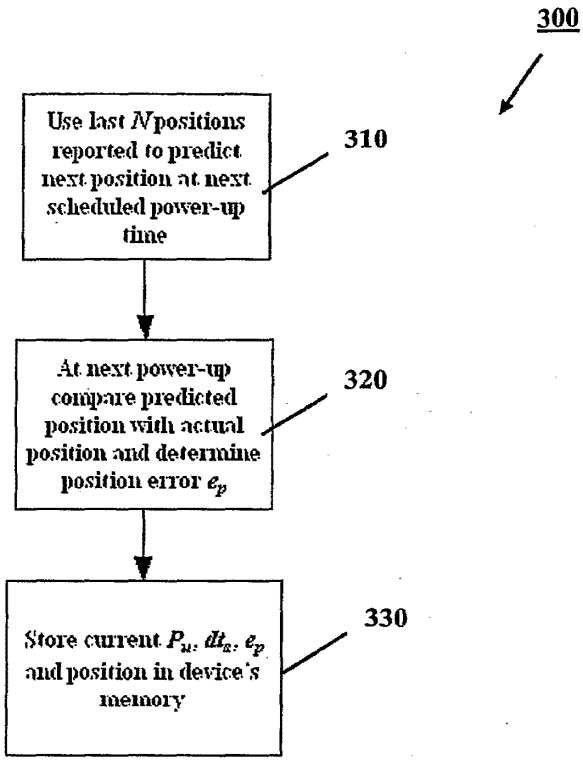

300
Use last N positions reported to predict next position at next scheduled power-up time
310
At next power-up compare predicted position with actual position and determine position error e_p
320
Store current P_n, dt_n, e_p and position in device's memory
330

FIG. 3

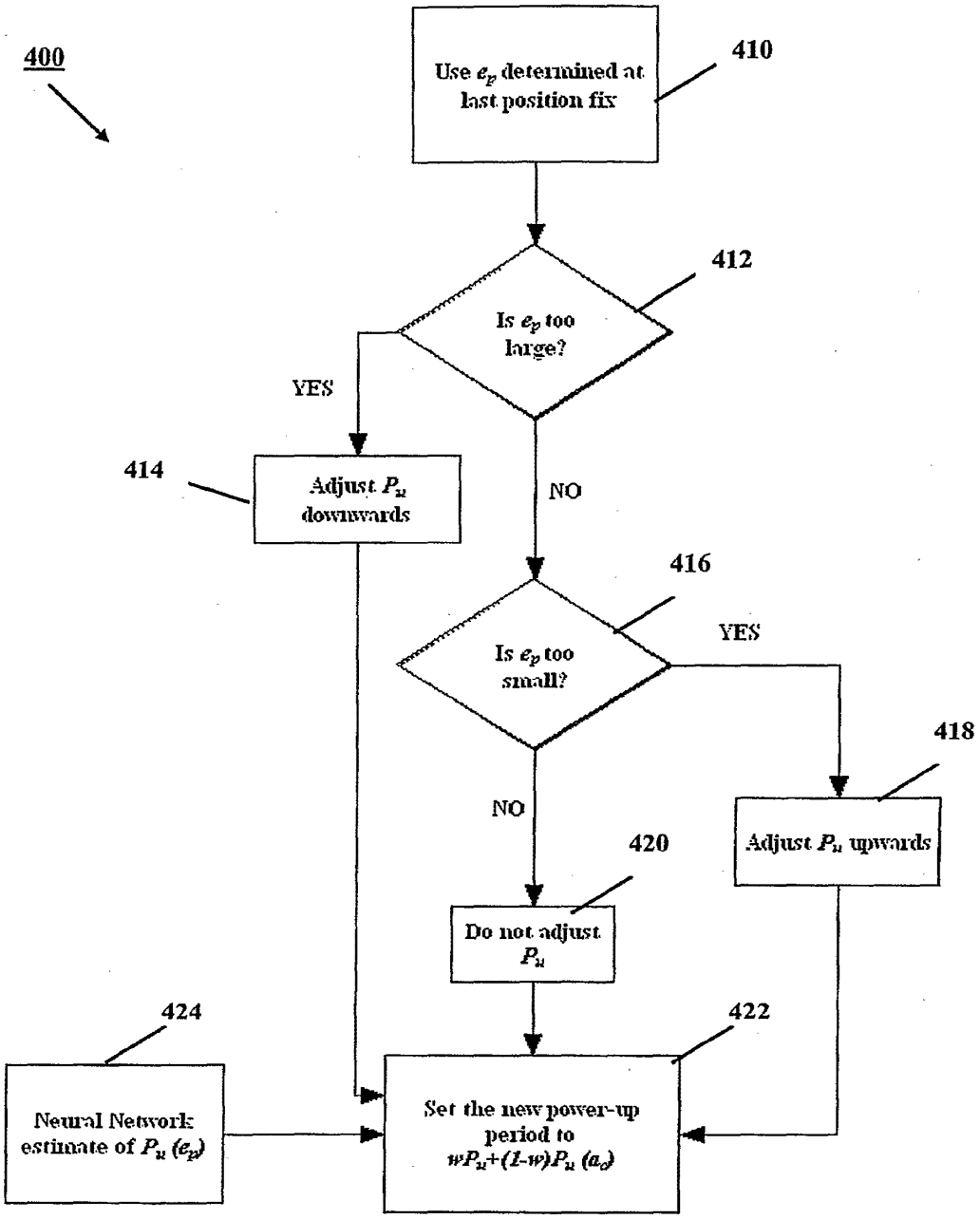

400
Use e_p determined at last position fix
410
Is e_p too large?
412
YES
NO
414
Adjust P_u downwards
Is e_p too small?
416
YES
NO
418
Adjust P_u upwards
420
Do not adjust P_u
424
Neural Network estimate of P_u (e_p)
422
Set the new power-up period to $wP_u+(1-w)P_u$ (a_o)

FIG. 4

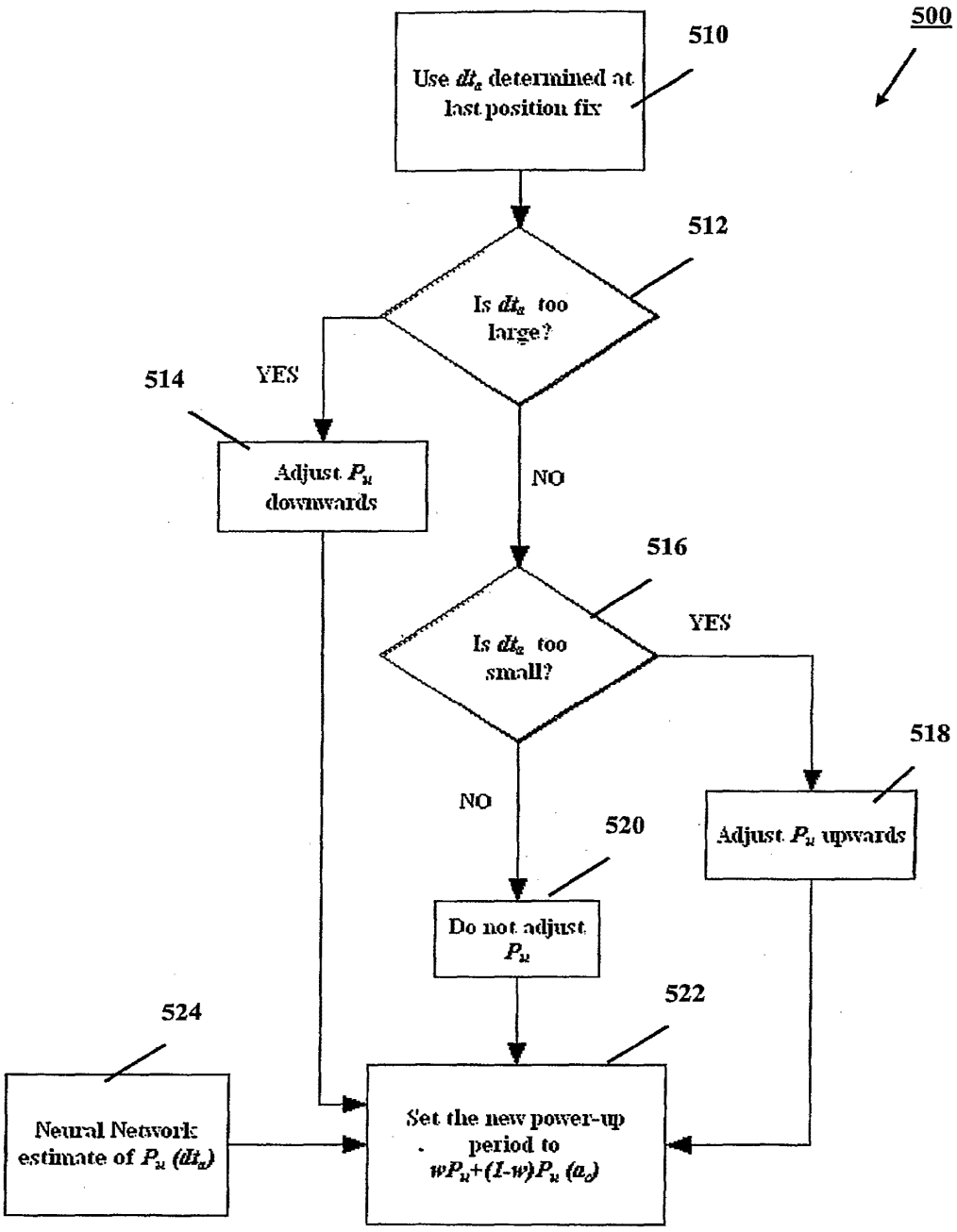

500
510
Use dt_a determined at last position fix
512
Is dt_a too large?
514
YES
Adjust P_u downwards
NO
516
Is dt_a too small?
YES
518
Adjust P_u upwards
NO
520
Do not adjust P_u
522
524
Neural Network estimate of P_u (dt_a)
Set the new power-up period to $wP_u+(1-w)P_u$ (a_o)

FIG. 5

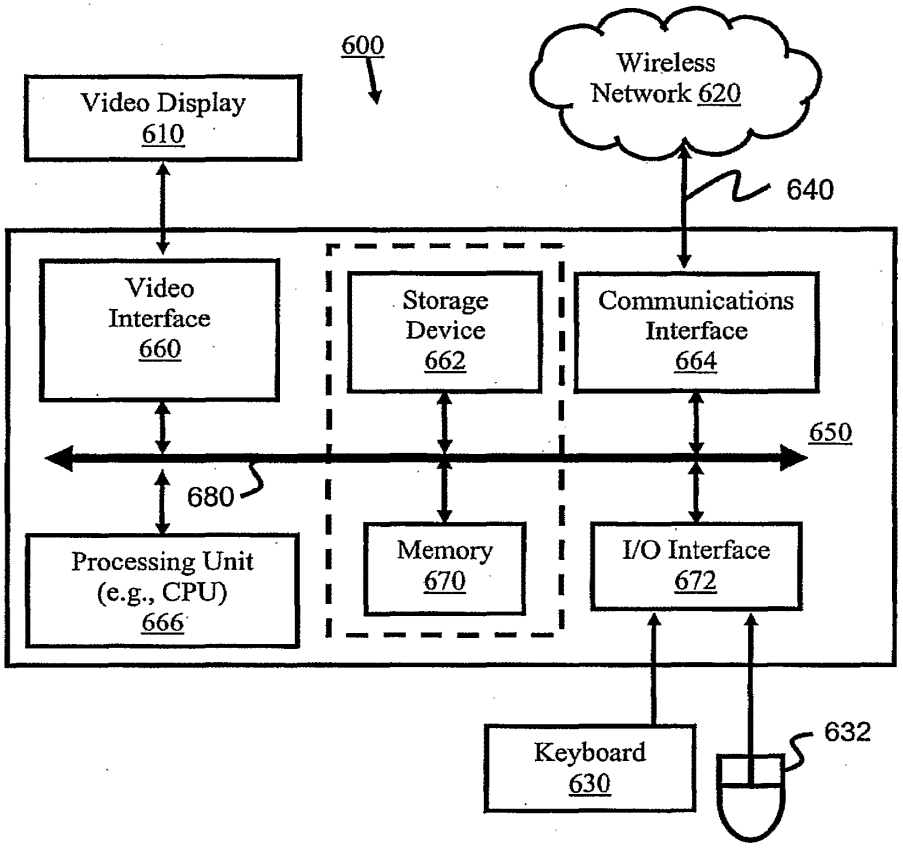

600
Wireless Network 620
Video Display 610
640
Video Interface 660
Storage Device 662
Communications Interface 664
650
680
Processing Unit (e.g., CPU) 666
Memory 670
I/O Interface 672
Keyboard 630
632

FIG. 6

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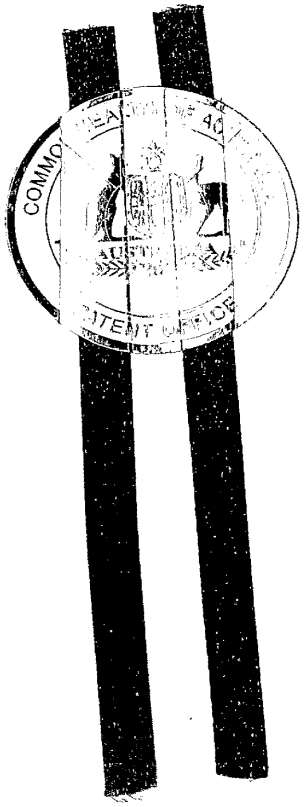
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Organisation Mondiale de la Propriété Intellectuelle (OMPI) - Genève, Suisse

PCT/AU2005/001351

Australian Government

Patent Office
Canberra

I, JANENE PEISKER, MANAGER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2004905024 for a patent by UNISEARCH LIMITED as filed on 02 September 2004.



WITNESS my hand this
Sixth day of October 2005

JANENE PEISKER
MANAGER EXAMINATION SUPPORT
AND SALES

S&F Ref: 672078

AUSTRALIA

Patents Act 1990

PROVISIONAL SPECIFICATION FOR THE INVENTION ENTITLED:

Self monitoring GPS on mobile device

Name and Address of Applicant:

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Name of Inventor:

Robert Anderson Malaney

This invention is best described in the following statement:

5805c

SELF MONITORING GPS ON MOBILE DEVICE

FIELD OF THE INVENTION

The present invention relates generally to GPS acquisition and in particular to power conservation for GPS-enabled devices.

BACKGROUND

Techniques for the positioning of mobile devices in a wireless environment are important for a number of applications, such as emergency location services, ad hoc networks, and vehicle tracking.

In the mobile phone industry, competing technologies address the specific issues of Emergency-911 (E-911) position location. Broadly speaking, these technologies fall into two categories: (1) network-based technologies and (2) Global Positioning Systems (GPS) technologies. The network-based technologies use network-based metrics (e.g., time of flight, angle of arrival etc). The GPS technologies use line-of-sight measurements to satellites.

Network-based and GPS technologies each attempt to meet the US Federal Communications Commission (FCC) requirements for E-911 Emergency Location Services. The FCC requirements set specific statistical requirements on the position accuracy on any technology. Currently the FCC's E-911 Phase II Plans dictate that 67% of all attempts for a position location must have an accuracy of less than 50m, and 95% of calls must have an accuracy of less than 150m (Federal Communications Commission E-911 http://www.fcc.gov/911/enhanced/). Although not mandated, it is generally accepted that acquisition time of a position fix must be in a reasonably short time scale. A positioning technology that can deliver a position fix within a timescale of 30 seconds is generally considered reasonable for E-911 services, since such a small amount of time has negligible impact on the total time taken for the emergency services to reach the emergency scene.

GPS-based techniques are known to provide accurate position measurements. However, such techniques are prone to a lengthy GPS acquisition time (the length of

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time taken from the time a GPS device is powered on until that device obtains a position fix). A principal reason for this is that the device does not know *a priori* which GPS satellites are currently in view and must undertake an exhaustive search to find the satellites in view. This is termed a "cold start". Generally speaking in cold start mode, a GPS device can take up to several minutes to find a location fix, which is a time-scale deemed inappropriate for many applications, such as E-911.

One simple approach to overcome this difficulty involves simply keeping the GPS device switched on at all times. After an initial fix, the satellite almanac and ephemeris data are continuously kept up-to-date, and a cold start phase can be avoided. In this mode, the GPS device is said to be in "hot start" mode. A principal disadvantage of always keeping the device in a hot-start mode is the drain on the battery resources of the mobile device. Battery power in a mobile device is a precious resource, and any steps that can be taken to maximize battery life are advantageous. Simply keeping a GPS device powered on at all times to avoid the cold start is generally considered an unacceptable solution. This is particularly the case for an application like E-911, where the GPS location finding capability is likely to be only rarely utilized.

A potential resolution to the problem of cold starts can be found in the Assisted-GPS (A-GPS) system proposed by Qualcomm; see Qualcomm White Paper, *How A-GPS Works*, 2001 (http://www.snaptrack.com/pdf/How_aGPS_works.pdf). In this system, the network "assists" the mobile device by transferring updated almanacs and ephemeris, collected by base stations, to the mobile device upon receipt of a location request. This speeds up the GPS acquisition of a mobile device relative to the acquisition from a cold start. The system also integrates network positioning information to find optimal position accuracy. However, this approach at attempting to solve the cold start problem comes at the cost of increased complexity in the network system design and incurs additional costs for the required extra infrastructure (i.e. network hardware and communications). This system is also not workable if the mobile device is disconnected from a network, but still requires a GPS position fix.

Another system attempting to address cold start is the use of periodic power-down of the GPS device. In this mode, the device is periodically switched off for a

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set period. As long as the time switched off remains small, at each onset of the power-up phase, the GPS device effectively commences in hot start mode. This periodic power-down of a GPS device is termed "TricklePower" by GPS chipset manufacturers; see Laipac Technology Inc., *Reference Guideline to TF GPS,* Sept 2001, (http://www.laipac.com/datasheets/gps/TF%20GPS%20Series.pdf). In this mode, a user is allowed to set initially the power-up period, P_u. For example, setting $P_u = 30$ minutes means the GPS device powers up every 30 minutes to acquire a position fix. Once the fix is obtained (usually within seconds), the GPS device enters power-down mode.

Simply guessing what value to set P_u at is not optimal. A need clearly exists for an improved GPS acquisition system.

SUMMARY

According to an aspect of the present invention, there is provided a method of acquiring GPS on a mobile device possessing GPS capability. The method comprises the step of setting a current value of the period of the power-up phase of the GPS dependent upon adaptive predictions of when the GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

According to another aspect of the present invention, there is provided a mobile device. The mobile device comprises a processor and memory coupled to the processor; a GPS module coupled to the processor providing a GPS capability for the mobile device; and means for setting a current value of the period of the power-up phase of the GPS module dependent upon adaptive predictions of when the GPS module should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

According to yet another aspect of the present invention, there is provided a computer program product for a mobile device possessing GPS capability. The computer program product having a computer readable medium storing a computer program for acquiring GPS on the mobile device. The computer program product comprises computer program code means for interfacing with the GPS capability of the mobile device and computer program code means for setting a current value of a

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period of the power-up phase of the GPS module dependent upon adaptive predictions of when the GPS module should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

According to yet another aspect of the present invention, there is provided a method of acquiring GPS on a mobile device possessing GPS capability. The method comprises the steps of using a position error between a predicted position and an actual position of the mobile device at a last position fix; if the position error is too large, adjusting a current value of the period of the power-up phase downward; if the position error is too small, adjusting the current value of the period of the power-up phase upward; estimating using a neural network a new value of the period of the power-up phase dependent upon the position error and setting a new value of the period of the power-up phase to a weighted value dependent upon an acceptable error bound.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the invention are described hereinafter by way of example with reference to the drawings, in which:

Fig. 1 is an image of a GPS-equipped mobile device with which an embodiment of the invention may be practiced;

Fig. 2 is a high-level block diagram of a system for adaptively predicting when a GPS-enable wireless communication device should be powered on in accordance with an embodiment of the invention;

Fig. 3 is a flowchart illustrating a method for determining position errors in accordance with an embodiment of the invention;

Fig. 4 is a flowchart illustrating a method of determining the value of P_u to satisfy position accuracy bounds in accordance with the embodiment of the invention;

Fig. 5 is a flowchart illustrating a method of determining the value of P_u to satisfy GPS acquisition time bounds; and

Fig. 6 is a block diagram of a general-purpose computer system with which embodiments of the invention may be practiced.

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DETAILED DESCRIPTION

Methods, apparatuses, and computer program products for energy efficient GPS acquisition on a mobile device are disclosed. The acquisition meets pre-assigned statistical accuracy and acquisition time. In the following description, numerous specific details, including particular wireless networks, positioning systems, network configurations, filtering techniques, and the like are set forth. However, from this disclosure, it will be apparent to those skilled in the art that modifications and/or substitutions may be made without departing from the scope and spirit of the invention. In other circumstances, specific details may be omitted so as not to obscure the invention.

The methods may be implemented in modules. A module, and in particular its functionality, can be implemented in either hardware or software. In the software sense, a module is a process, program, or portion thereof that usually performs a particular function or related functions. Such software may be implemented in C, C++, JAVA, JAVA BEANS, Fortran, or a combination thereof, for example, but may be implemented in any of a number of other programming languages/systems, or combinations thereof. In the hardware sense, a module is a functional hardware unit designed for use with other components or modules. For example, a module may be implemented using discrete electronic components, or it may form at least a portion of an entire electronic circuit such as a Field Programmable Gate Arrays (FPGA), Application Specific Integrated Circuit (ASIC), and the like. A physical implementation may also comprise configuration data for a FPGA, or a layout for an ASIC, for example. Still further, the description of a physical implementation may be in EDIF netlisting language, structural VHDL, structural Verilog, or the like. Numerous other possibilities exist. Those skilled in the art will appreciate that the system may also be implemented as a combination of hardware and software modules.

Some portions of the following description are presented in terms of algorithms and representations of operations on data within a computer system or other device capable of performing computations. Such algorithmic descriptions and representations may be used by those skilled in the art to convey the substance of their work to others skilled in the art. An algorithm is a self-consistent sequence of steps

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leading to a desired result. The steps are those requiring physical manipulations of physical quantities. Usually, though not necessarily, these quantities take the form of electrical, magnetic, or electromagnetic signals capable of being stored, transferred, combined, compared, and otherwise manipulated. These signals may be referred to as bits, values, elements, symbols, characters, terms, numbers, or the like.

The above and similar terms are to be associated with the appropriate physical quantities and are merely convenient labels applied to such quantities. Unless specifically stated otherwise, and as apparent from the following, discussions utilizing terms such as "receiving", "calculating", "predicting", "comparing", "determining", "storing", "adjusting", "using", "estimating", "setting" or the like, refer to the action and processes of a computer system, or a similar electronic device. Such a system or device manipulates and transforms data represented as physical quantities within the registers and memories of the computer system into other data similarly represented as physical quantities within the computer system registers, memories, or another form of storage, transmission or display devices.

Apparatuses and systems for performing the operations of the methods are also described. Such an apparatus may be specifically constructed for the required purpose. Alternatively, the apparatus may comprise a general-purpose computer (e.g., a notebook PC) or another computing device (e.g., a PDA), which may be selectively activated or reconfigured by a computer program read by the computer. The algorithms presented herein are not inherently related to any particular computer or other apparatus; various general-purpose machines may be used with programs.

The embodiments of the invention also relate to a computer program(s) or software, in which method steps may be put into effect by computer code. The computer program is not intended to be limited to any particular programming language, operating environment, and implementation thereof. A variety of programming languages, operating systems, and coding thereof may be used. Moreover, the computer program is not intended to be limited to any particular control flow. There are many other variants of the computer program, which can use different control flows without departing the scope and spirit of the invention.

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Furthermore, one or more of the steps of the computer program may be performed in parallel rather than sequentially.

The computer program may be stored on any computer readable medium. The computer readable medium may comprise storage devices, such as magnetic media disks, CD-ROMs, DVDs, flash RAM devices, memory chips, memory cards, magnetic tape, other storage devices and media suitable for interfacing with and being read by a general-purpose computer, and combinations thereof. The computer readable medium may also include a hard-wired medium, such as a local area network or the Internet, or wireless medium, such as an IEEE 802.11 wireless network, BlueTooth, a GSM mobile telephone system, PCS, and GPS. The computer program when loaded and executed on such a general-purpose computer effectively results in an apparatus that implements the method steps of the embodiments.

The methods of the embodiments comprise particular control flows. However, different control flows can be practiced without departing from the scope and spirit of the invention.

I. Introduction

Hereinafter, the next "power-up time" means the time derived by adding the current value of P_u to the time at which a power down occurs. The embodiments of the invention systematically set the period of the power-up phase, P_u, whilst retaining the accuracy of the position fix and the acquisition times of the position fix within acceptable bounds.

Adaptive predictions are made of when a GPS device, embedded in a wireless communication device, should be powered on to meet specifications on positioning accuracy and GPS acquisition time. The embodiments of the invention address the issue of setting the period of the power-up phase, P_u, whilst retaining the accuracy of the position fix and the acquisition times of the position fix within acceptable bounds. Simply setting P_u to some value at the onset of operation may provide the required bounds for some time epoch, but there is no guarantee that this will also be the case in the future. Also, this simple approach provides no sense of an optimized value of P_u.

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By this, what is meant is the maximum value of P_u allowable whilst still retaining the accuracy of the position fix and the acquisition times of the position fix within acceptable bounds. An example of an inefficient system design would be a GPS system reporting positions every second when an acceptable error bound (accuracy) of 50 meters was required on a device moving at 1 meter per second. The embodiments of the invention allow a GPS device to determine dynamically an optimal P_u in response to such a circumstance.

The methods and apparatuses in accordance with embodiments of the invention address these issues, using adaptive-filter and machine-learning techniques within the mobile device. These techniques allow the mobile device to self monitor the predicted accuracy error and the predicted acquisition times of the GPS device. If these predicted values fail to meet acceptable bounds, the value of P_u is reduced. If the predicted values meet the acceptable bounds, the value of P_u is increased. The embodiments of the invention provide a technology referred to hereinafter as Self Monitored (SM) – GPS. Although applicable to E-911 services, SM-GPS is equally applicable to any mobile GPS device. SM-GPS allows such a device to operate in the most energy efficient way whilst still retaining the position accuracy and acquisition times deemed appropriate by the operator of the GPS device.

The embodiments of the invention assist a mobile device in GPS position acquisition in the most energy efficient way, whilst still retaining the position accuracy and acquisition times deemed appropriate by the operator of the GPS device. In this context, "mobile device" means a power limited (*e.g.* battery operated) device possessing embedded GPS capability. Examples of such devices are GPS-capable mobile telephones, laptop computers, Personal Digital Assistants (PDAs), and wireless sensor devices, to name a few.

II. Device & Software to Self-Monitor Power of Power-Up Phase

In one embodiment, software is embedded in a mobile device to self-monitor the period of the power-up phase, P_u for the device, and to self-adjust the value of P_u if P_u is inconsistent with maximally conserving the battery power of the mobile

device. Fig. 1 shows such a GPS-equipped mobile device 100. The GPS- equipped mobile device may be, for example, a Compaq ® iPAQ ® PDA with a GPS adaptor connected to the PDA. Software embodying a method to self-monitor the period of the power-up phase is used in the PDA to implement this embodiment.

The embodiments of the invention involve the determination of the error between the predicted position of the mobile device and that of the actual position reported by its GPS. Given a past history of N reported positions, prediction techniques can be used to predict the position of the device at some time t later (the next power-up phase). The value N is determined *a priori,* usually based on experience of testing of a particular adaptive learning algorithm. In an embodiment of the invention, an adaptive filter technique based on neural networks is used for the position prediction. The difference between this predicted position and the actual position measured at time t can be used to formulate the position error. After forming this position error, the values of the position, the position error, and the value of P_u used at the time of the actual position measurement are stored in the mobile device's memory. In addition, acquisition time dt_a may be stored.

Fig. 2 is a block diagram of the system 200 that may be implemented using the PDA of Fig. 1. The system 200 comprises a neural network module 230 that receives various inputs 210-220 to produce a predicted period of the power-up phase P_u 240. The neural network module 230 predicts the next time to power on the GPS device. This module 230 does so dependent upon various inputs including the last satellite positions 210, the last GPS position/time 212, the last GPS error 214, the current power-up time 216, information about whether or not the last target (i.e. were the accuracy requirements satisfied or not) was achieved, and the current radio position and error 220. The latter information 220 may be determined using Cramer-Rao bounds. Further details of the neural network 200 are set forth hereinafter.

A flow chart of a method 300 to determine and store P_u, dt_u, and e_p is depicted in Fig. 3. Processing commences in step 310 in which the last N positions reported are used to predict the next position at the next scheduled power-up time. That is, given the past position history stored in the mobile device, an adaptive algorithm predicts the next position value. A number of techniques are known for predicting the

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next position of a mobile device based on its past history of positions, such as regression, Kalman filter, particle filter. In step 320, at the next power-up time, the predicted position of the GPS-enabled mobile device is compared with the actual position of the mobile device, and the position error e_p is determined. Thus, given a predicted value of the position, the predicted value is checked against the actual position location reported the next time the GPS device is powered on to form the prediction error e_p. In step 330, the current values of the period of the power-up phase P_u, acquisition time dt_a, and prediction error e_p are stored. This information may be stored in the memory of the wireless device or other suitable storage device. Processing then terminates. The mobile device itself can time how long it took (from the onset of power up) to obtain a GPS fix - this is the acquisition time. If GPS position is unavailable at a particular epoch, nothing is recorded.

The foregoing method uses the stored position error values e_p to determine how best to set the value of P_u given an acceptable error bound a_c. A system can thus be designed that adaptively determines the best functional fit to the function $P_u(e_p)$. In one embodiment, a technique based on neural networks 200 can be used for the determination of $P_u(e_p)$. Given the current best estimate of this function and the acceptable error bound a_c, the value of P_u can be then set using $P_u(a_c)$. In addition, a weighted contribution of $P_u(a_c)$ can be allowed for to be used in setting the new power-up period. A separate algorithm checks whether the current power-up period is too large or too small, and if so adjusts P_u accordingly. The new power-up period can then be set as $wP_u + P_u(a_c)$, where w is a weighting factor in the range 0-1.

Fig. 4 is a flow diagram of a method 400 for adjusting the value of P_u and setting a new power-up period to deliver SM-GPS to mobile devices. Following on from steps described in Fig. 3, the method 400 commences in step 410. In step 410, the stored position error value e_p, determined from the last position fix, is read. In decision step 412, a check is made to determine if the stored position error value e_p is too large. In one embodiment, the term "too large" means that e_p is larger than a_c.

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Variations on this in terms some fraction or multiple of a_c can also be used. If decision step 412 returns true (Yes), processing continues at step 414. In step 414, the current values of the period of the power-up phase P_u is adjusted down. In one embodiment, the new value may be adjusted to cP_u, where c is set at 0.5. Again, different values of c or different reduction algorithms may be practiced. The new power-up period has a minimum threshold value below which the power-up period cannot be set. This threshold value may be one second - which is the period set in the default TricklePower mode of many GPS chipsets. However, other threshold values may be specified. Processing continues from step 414 at step 422. Otherwise, if decision step 412 returns false (No), processing continues at step 416.

In decision step 416, a check is made to determine if the stored position error values e_p is too small. In one embodiment, the term "too small" means e_p is smaller than $0.5a_c$. However, variations on this in terms of some other fraction of a_c can also be used. If decision step 416 returns true (Yes), processing continues at step 418. In step 418, the current value of the power-up period P_u is adjusted upwards. That is, the value of P_u is increased to a new value. The new value may be calculated as bP_u, where b is set at 1.5. Once again, different values of b or different increase algorithms may be practiced. The new power-up period has a maximum threshold value below which it cannot be set. This threshold value may be ten minutes, for example, but this can be set by the user *a priori*. From step 418, processing continues at step 422. If decision step 416 returns false (No), processing continues at step 420.

In step 420, the current value of the power-up period P_u is not changed, that is, it is maintained at the same value. Processing then continues at step 422. In step 422, the new power-up period is set to $wP_u + (1-w)P_u(a_c)$. In step 424, a neural network estimate of $P_u(e_p)$ is provided to step 422. That is, separate from the above steps, a neural network 200 estimate of the function $P_u(e_p)$ is made based on the stored values of P_u and e_p. A weighted average of these two independent values may be used to set the final new power-up period as $wP_u + (1-w)P_u(a_c)$, where a_c is again the acceptable error bound on the position. The value of weighting parameter w is set

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a priori by the manufacturer or user. In a variant of this process, w can be made time dependent. From step 422, processing terminates.

If position accuracy is the sole criteria dictating the value of P_u, the above process would suffice. However, if the acquisition time is the sole criteria dictating the value of P_u, the process 500 depicted in the flowchart described in Fig. 5 would suffice. This process 500 is similar to that 400 given above, except that the acquisition time dt_p is used to determine the new power-up period. It is the comparison of dt_p with the pre-assigned value for the bound on acquisition time that is used in decision making process. In step 510, the stored acquisition time dt_p is used to determine the last position fix. In decision step 512, a check is made to determine if the stored acquisition time dt_p is too large. In Fig. 5, a_c is now the acceptable error on acquisition time. The term "too large" means that dt_a is larger than a_c. Variations on this in terms of some fraction or multiple of a_c can also be used. If decision step 512 returns true (Yes), processing continues at step 514. In step 514, the current values of P_u is adjusted down. Thus, if dt_a is too large, the value of P_u is reduced to a new value. The new value may be set to cP_u, where c is set at 0.5. Different values of c or different reduction algorithms may be used. Again, a minimum value of the power-up period is imposed. Processing continues from step 514 at step 522. Otherwise, if decision step 512 returns false (No), processing continues at step 516.

In decision step 516, a check is made to determine if the stored acquisition time dt_p is too small. The term "too small" means that dt_a is smaller than $0.5\,a_c$. Variations on this in terms of some other fraction of a_c can also be used. If decision step 516 returns true (Yes), processing continues at step 518. In step 518, the current value of P_u is adjusted upwards. Thus, if dt_a is too small, the value of P_u is increased to a new value. The new value of the power-up period may be set to bP_u, where b is set at 1.5. Different values of b or different increase algorithms may be used. Again a maximum value of the power-up period is imposed. From step 518, processing

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continues at step 522. If decision step 516 returns false (No), processing continues at step 520.

In step 520, the current value of the power-up period P_u is not changed, that is, it is maintained at the same value. Processing then continues at step 522. In step 522, the new power-up period is set to $wP_u + (1-w)P_u(a_c)$. In step 524, a neural network estimate of $P_u(dt_p)$ is provided to step 522. A weighted average of these two independent values is then used to set the final new power-up period as $wP_u + (1-w)P_u(a_c)$, where a_c is again the acceptable error bound on the acquisition time. The value of w is set *a priori* by the manufacturer or user. In a variant of this process w can be made time dependent. That is, separate from the above steps, a neural network 200 estimate of the function $P_u(dt_p)$ is made based on the stored values of P_u and dt_p. From step 522, processing terminates.

In the event that both the position accuracy and the acquisition time are to be considered in dictating the new value of the power-up period, both algorithms shown in Figs. 4 and 5 may be run simultaneously and independently. The smaller of the two new values of the power-up period reported by the algorithms may be utilized as the final new value.

As used by an E-911 application, the mobile device can automatically power-up the GPS device and determine its current position, if the GPS is available at that particular time. Due the SM-GPS algorithm described hereinbefore, cold start of the GPS device should be avoided. If for some reason the GPS is unavailable (*e.g.* by non-line of sight effects) when an emergency position request is made, the mobile device can report the GPS position predicted at the last power-up phase. This has the advantage over A-GPS that no added network infrastructure is required, and an estimate of the mobile device's current position is given even if the GPS suddenly became unavailable.

In the context of continuous position requests, such as in a tracking application, the SM-GPS algorithm adaptively alters the power-up period to find the largest value of P_u at that particular epoch that is consistent with the required accuracy and acquisition time bounds. This has an advantage relative to current

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systems that the user of the device does not have to estimate and manually enter such a value *a priori*. This also has the advantage of self-adjusting the value of P_u to changing conditions.

III. Neural Networks

The adaptive prediction algorithm used for predicting positions and within the SM-GPS is similar to a Time Delay Neural Network (TDNN). Such networks are neural networks that have a special topology used for position-independent recognition of features within a larger pattern. These types of networks have been successfully used in applications such as speech prediction algorithms and stock predictions. Flexibility in the architectural design of these networks allows them to handle any complex nonlinear behavior as well as more simple linear behavior. A TDNN with just one neuron and a linear transfer function can be trained to operate as an effective linear adaptive filter.

The details of TDNNs, how they operate and the different architectures possible (*e.g.* learning strategies, transfer functions, number of layers, weights) have been well documented in the literature. For example, see Simon Haykin, *Neural Networks: A comprehensive foundation*, MacMillan, New York, 1994. In one embodiment, the previous positions are used to form the input vectors of the neural network and the output is the predicted position.

Other neural network are constructed to optimally find the functions $P_u(e_p)$ and $P_u(dt_a)$ in Figs. 4 and 5, respectively. These are referred to as "function discovery" neural networks. Again these networks are adaptive, in the sense that the functional forms $P_u(e_p)$ and $P_u(dt_a)$ do not remain constant in time.

To accommodate various forms of relationships between the input vectors and the output in a neural network, Multi-Layer Perceptron (MLP) models are used. These types of models can be applied to both the TDNN networks and the function discovery neural networks. MLP models typically have an input vector of length r and a hidden layer of s neurons. A matrix of weights $\alpha_{s,r}$ describes the relationship between the input vectors and the layer of neurons. Various transfer function can be

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deployed such as a log-sigmiod transfer function. In general, the number of hidden layers can be increased to accommodate even more complex systems. In one embodiment, an MLP network that is adopted involves one hidden layer and a number of neurons equal to the size of the input vector. A log-sigmoid transfer function is adopted. For TDNN, the weights associated with the neural network adapt to the newly predicted position and its subsequent measurement of the actual position to minimize future prediction errors. By this mechanism, the network adapts and "learns" the optimal weight $\alpha_{s,r}$ settings relevant to that particular epoch.

For the function discovery neural networks, the weights associated with the neural networks adapt to the newly predicted functional form of the functions ($P_u(e_p)$ and $P_u(dt_a)$ of Figs. 4 and 5, respectively, based on the incoming new data. This means that the neural networks are constantly re-training themselves.

IV. Other Embodiments & Variations

The adaptive learning algorithms can be embedded on a signal processing chip in a mobile device. For additional power savings, the neural network calculations may be passed to some external processing unit within the network, if the mobile device is in communication with a larger network, e.g. a wireless network. The value of the power-up period calculated by the external device may then be passed back to the mobile device.

In the event of a GPS signal being unavailable, the position error and acquisition time are not defined for that time. As this could be an indication that the user is in an area where reception of the GPS satellite signals is poor, one may wish not to decrease the power-up period, or at least to limit the decrease. In this way additional energy sources are not used in a vain attempt at acquiring a GPS signal.

There are many neural network architectures that could be deployed in the algorithms of Figs. 2, 4 and 5. For example, the predicted position can also be a function of the actual P_u being used (in general shorter values of P_u have smaller errors). A neural network can be invoked in which the past history of P_u is also an input to the neural network. Radial basis function networks could also be deployed in

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the estimates of the functions $P_u(e_p)$ and $P_u(dt_a)$. A thorough discussion of neural network architectures can be found in standard texts. Again, see for example Simon Haykin, *Neural Networks: A comprehensive foundation*, MacMillan, New York, 1994.

VI. Other Embodiments & Variations

The methods according to the embodiments of the invention may be practiced using one or more general-purpose computer systems, handheld devices, cellular phone, and other suitable mobile computing devices, in which the processes described with reference to Figs. 1-5 may be implemented as software, such as an application program executing within the computer system or a handheld device. In particular, instructions in the software that are carried out by the computer effect the steps in the method, at least in part. Software may include one or more computer programs, including application programs, an operating system, procedures, rules, data structures, and data. The instructions may be formed as one or more code modules, each for performing one or more particular tasks. The software may be stored in a computer readable medium, comprising one or more of the storage devices described below, for example. The computer system loads the software from the computer readable medium and then executes the software. Fig. 6 depicts an example of a computer system 600 with which the embodiments of the invention may be practiced. A computer readable medium having such software recorded on the medium is a computer program product. The use of the computer program product in the computer system may effect an advantageous apparatus in accordance with the embodiments of the invention.

Fig. 6 illustrates the computer system 600 in block diagram form, coupled to a wireless network 620. An operator may use the keyboard 630 and/or a pointing device such as the mouse 632 (or touchpad, for example) to provide input to the computer 650. The computer system 600 may have any of a number of output devices, including line printers, laser printers, plotters, and other reproduction devices connected to the computer. The computer system 600 can be connected to one or more other computers via a communication interface 664 using an appropriate

communication channel 640. The computer network 620 may comprise a wireless local area network (WLAN), or a 3G network, for example. While not depicted in Fig. 6 to simplify the drawing, it will be readily appreciated by those skilled in the art that the computer system 600 may be equipped with a GPS module, for example, in the manner shown in Fig. 1.

The computer 650 may comprise a processing unit 666 (e.g., one or more central processing units) 666, memory 670 which may comprise random access memory (RAM), read-only memory (ROM), or a combination of the two, input/output (IO) interfaces672, a graphics interface 660, and one or more storage devices 662. The storage device(s) 662 may comprise one or more of the following: a floppy disc, a hard disc drive, a magneto-optical disc drive, CD-ROM, DVD, a data card or memory stick, flash RAM device, magnetic tape or any other of a number of non-volatile storage devices well known to those skilled in the art. While the storage device is shown directly connected to the bus in Fig. 6, such a storage device may be connected through any suitable interface, such as a parallel port, serial port, USB interface, a Firewire interface, a wireless interface, a PCMCIA slot, or the like. For the purposes of this description, a storage unit may comprise one or more of the memory 670 and the storage devices 662 (as indicated by a dashed box surrounding these elements in Fig. 6).

Each of the components of the computer 650 is typically connected to one or more of the other devices via one or more buses 680, depicted generally in Fig. 6, that in turn comprise data, address, and control buses. While a single bus 680 is depicted in Fig. 6, it will be well understood by those skilled in the art that a computer or other electronic computing device, such as a PDA, may have several buses including one or more of a processor bus, a memory bus, a graphics card bus, and a peripheral bus. Suitable bridges may be utilized to interface communications between such buses. While a system using a CPU has been described, it will be appreciated by those skilled in the art that other processing units capable of processing data and carrying out operations may be used instead without departing from the scope and spirit of the invention.

The computer system 600 is simply provided for illustrative purposes, and other configurations can be employed without departing from the scope and spirit of the invention. Computers with which the embodiment can be practiced comprise IBM-PC/ATs or compatibles, laptop/notebook computers, one of the Macintosh (TM) family of PCs, Sun Sparcstation (TM), a PDA, a workstation or the like. The foregoing are merely examples of the types of devices with which the embodiments of the invention may be practiced. Typically, the processes of the embodiments, described hereinafter, are resident as software or a program recorded on a hard disk drive as the computer readable medium, and read and controlled using the processor. Intermediate storage of the program and intermediate data and any data fetched from the network may be accomplished using the semiconductor memory.

In some instances, the program may be supplied encoded on a CD-ROM or a floppy disk, or alternatively could be read from a network via a modem device connected to the computer, for example. Still further, the software can also be loaded into the computer system from other computer readable medium comprising magnetic tape, a ROM or integrated circuit, a magneto-optical disk, a radio or infra-red transmission channel between the computer and another device, a computer readable card such as a PCMCIA card, and the Internet and Intranets comprising email transmissions and information recorded on websites and the like. The foregoing is merely an example of relevant computer readable mediums. Other computer readable mediums may be practiced without departing from the scope and spirit of the invention.

A small number of embodiments of the invention regarding methods, systems, and computer program products for energy efficient GPS acquisition on a mobile device have been described. In the light of the foregoing, it will be apparent to those skilled in the art in the light of this disclosure that various modifications and/or substitutions may be made without departing from the scope and spirit of the invention.

CLAIMS

The claims defining the invention are as follows:-

1. A method of acquiring GPS on a mobile device possessing GPS capability, said method comprising the step of:

setting a current value of the period of the power-up phase of said GPS dependent upon adaptive predictions of when said GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

2. The method according to claim 1, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable bounds.

3. The method according to claim 1, wherein said mobile device determines dynamically an optimal period of the power-up phase.

4. The method according to claim 1, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

5. The method according to claim 4, wherein said adaptive-filter and machine learning techniques are implemented using said mobile device.

6. The method according to claim 1, wherein said setting step comprises:

if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

if at least one of predicted accuracy error and predicted acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

7. The method according to claim 1, wherein said mobile device comprises a power limited device.

8. The method according to claim 1, wherein said mobile device comprises an embedded GPS device.

9. The method according to claim 1, comprising the step of making adaptive predictions using a neural network.

10. The method according to claim 1, wherein said setting step comprises:

predicting a next position a next scheduled power-up time using a number of last positions reported;

comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

storing current values of period of the power-up phase, acquisition time, position error and position in a storage unit of said mobile device.

11. A mobile device, comprising:

a processor and memory coupled to said processor;

a GPS module coupled to said processor providing a GPS capability for said mobile device; and

means for setting a current value of the period of the power-up phase of said GPS module dependent upon adaptive predictions of when said GPS module should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

12. The mobile device according to claim 11, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable bounds.

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Google LLC et al v. Nariste Networks Pty. Ltd.

13. The mobile device according to claim 11, wherein said mobile device determines dynamically an optimal period of the power-up phase.

14. The mobile device according to claim 11, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

15. The mobile device according to claim 14, wherein said adaptive-filter and machine –learning techniques are implemented using said mobile device.

16. The mobile device according to claim 11, wherein said setting means comprises:

means for, if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

means for, if at least one of predicted accuracy error and predicted acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

17. The mobile device according to claim 11, wherein said mobile device comprises a power limited device.

18. The mobile device according to claim 17, wherein said mobile device comprises a battery for powering said mobile device.

19. The mobile device according to claim 11, comprising a neural network module for making adaptive predictions.

20. The mobile device according to claim 11, wherein said setting means comprises:

means for predicting a next position a next scheduled power-up time using a

number of last positions reported;

means for comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

means for storing current values of a period of the power-up phase, acquisition time, position error and position in a storage unit of said mobile device.

21. A computer program product for a mobile device possessing GPS capability, said computer program product having a computer readable medium storing a computer program for acquiring GPS on said mobile device, comprising:

computer program code means for interfacing with the GPS capability of said mobile device; and

computer program code means for setting a current value of a period of the power-up phase of said GPS module dependent upon adaptive predictions of when said GPS module should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

22. The computer program product according to claim 21, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable bounds.

23. The computer program product according to claim 21, wherein said computer program product determines dynamically an optimal period of the power-up phase.

24. The computer program product according to claim 21, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

25. The computer program product according to claim 24, wherein said adaptive-filter and machine learning techniques are implemented using said mobile device

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26. The computer program product according to claim 21, wherein said computer program code means for setting comprises:

computer program code means for, if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

computer program code means for, if at least one of predicted accuracy error and predicted acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

27. The computer program product according to claim 21, wherein said mobile device comprises a power limited device.

28. The computer program product according to claim 27, wherein said mobile device comprises a battery for powering said mobile device.

29. The computer program product according to claim 21, comprising computer program code means for providing a neural network module to make adaptive predictions.

30. The computer program product according to claim 21, wherein said computer program code means for setting comprises:

computer program code means for predicting a next position a next scheduled power-up time using a number of last positions reported;

computer program code means for comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

computer program code means for storing current values of a period of the power-up phase, acquisition time, position error and position in a storage unit of said mobile device.

31. A method of acquiring GPS on a mobile device possessing GPS capability, said method comprising the steps of:

using a position error between a predicted position and an actual position of said mobile device at a last position fix;

if the position error is too large, adjusting a current value of the period of the power-up phase downward;

if the position error is too small, adjusting the current value of said period of the power-up phase upward;

estimating using a neural network a new value of said period of the power-up phase dependent upon said position error; and

setting a new value of said period of the power-up phase to a weighted value dependent upon an acceptable error bound.

32. A method of acquiring GPS on a mobile device possessing GPS capability, said method comprising the steps of:

using an acquisition time at a last position fix;

if the acquisition time is too large, adjusting a current value of the period of the power-up phase downward;

if the acquisition time is too small, adjusting the current value of said period of the power-up phase upward;

estimating using a neural network a new value of said period of the power-up phase dependent upon said acquisition time; and

setting a new value of said period of the power-up phase to a weighted value dependent upon an acceptable bound.

33. A method of acquiring GPS on a mobile device possessing GPS capability, said method being substantially as hereinbefore disclosed with reference to any one of the embodiments shown in Figs. 1 to 6 of the accompanying drawings.

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34. A mobile device, said mobile device being substantially as hereinbefore disclosed with reference to any one of the embodiments shown in Figs. 1 to 6 of the accompanying drawings.

35. A computer program product for a mobile device possessing GPS capability, said computer program product being substantially as hereinbefore disclosed with reference to any one of the embodiments shown in Figs. 1 to 6 of the accompanying drawings.

36. A method of acquiring GPS on a mobile device possessing GPS capability, said method being substantially as hereinbefore disclosed with reference to any one of the embodiments shown in Figs. 1 to 6 of the accompanying drawings.

DATED this Second Day of September, 2004

Unisearch Limited

Patent Attorneys for the Applicant

SPRUSON & FERGUSON

Page 173 of 448 (IPR2023-01374)
Google LLC et al v. Nariste Networks Pty. Ltd.

SELF MONITORING GPS ON MOBILE DEVICE

ABSTRACT

A method, a mobile device and a computer program product for acquiring GPS on a mobile device possessing GPS capability are disclosed. The method comprises the step of setting a current value of the period of the power-up phase of the GPS dependent upon adaptive predictions of when the GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

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Google LLC et al v. Nariste Networks Pty. Ltd.

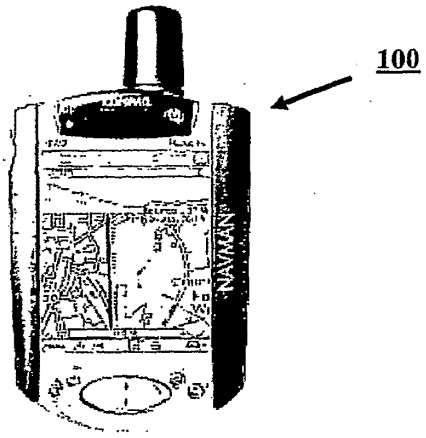


FIG. 1

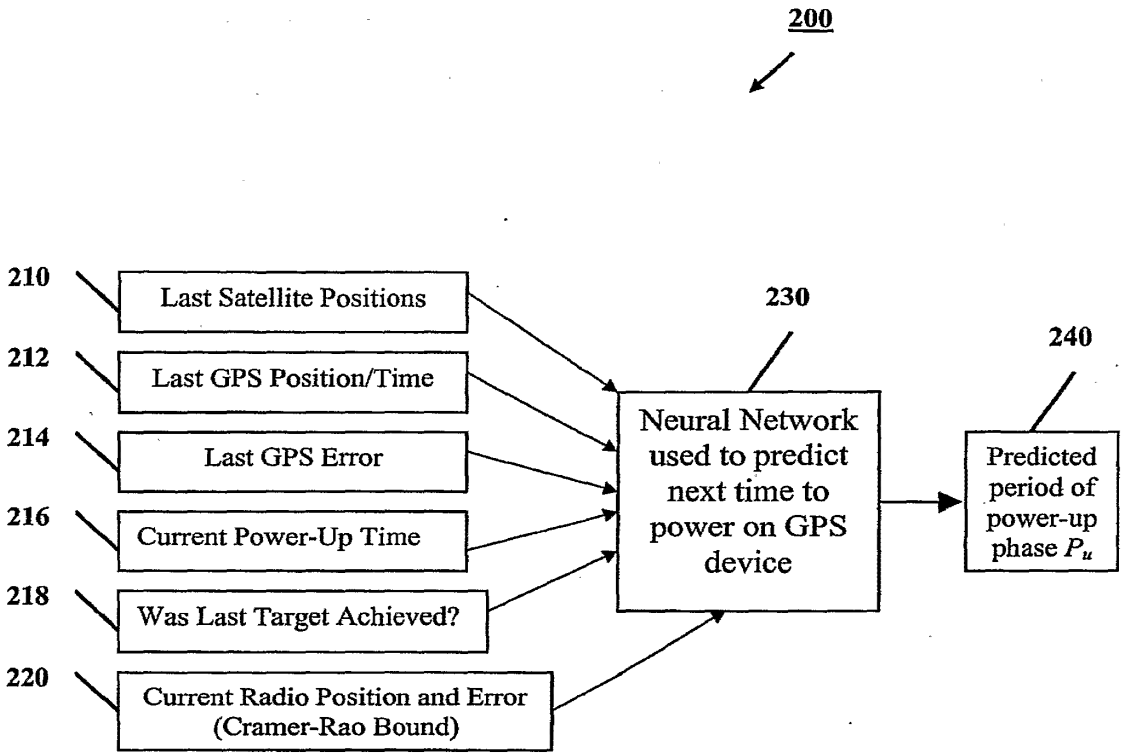

200
210
Last Satellite Positions
212
Last GPS Position/Time
214
Last GPS Error
216
Current Power-Up Time
218
Was Last Target Achieved?
220
Current Radio Position and Error (Cramer-Rao Bound)
230
Neural Network used to predict next time to power on GPS device
240
Predicted period of power-up phase P_u

FIG. 2

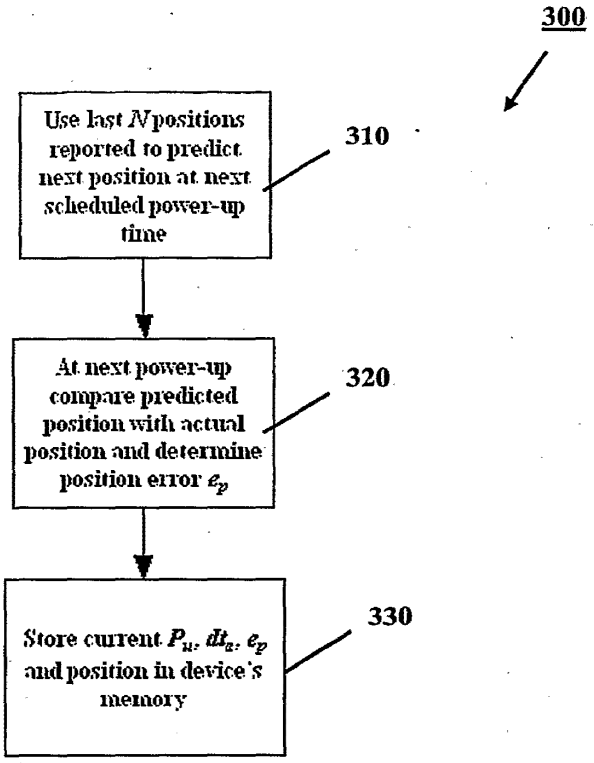

300
Use last N positions reported to predict next position at next scheduled power-up time
310
At next power-up compare predicted position with actual position and determine position error e_p
320
Store current P_u, dt_a, e_p and position in device's memory
330

FIG. 3

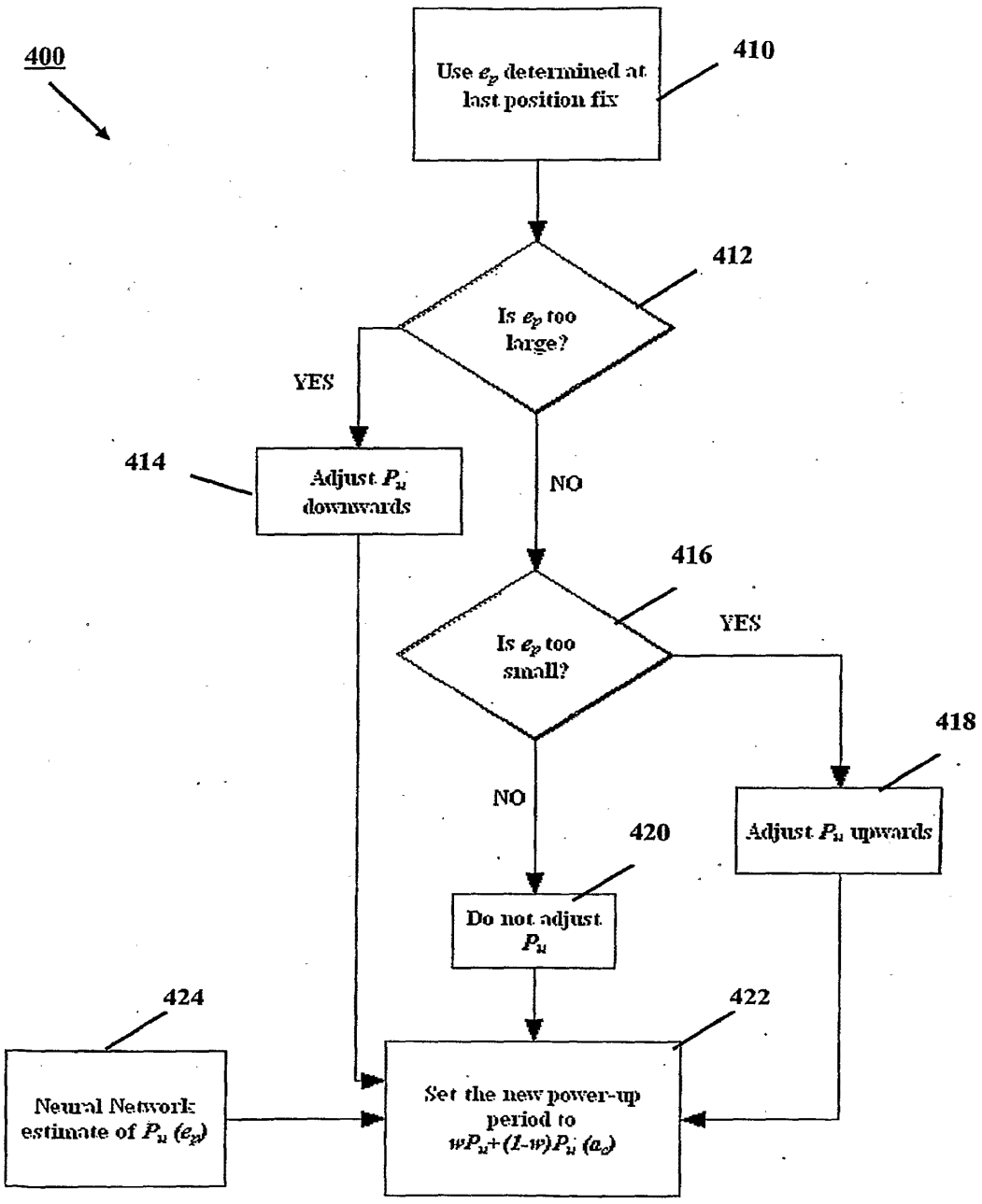


FIG. 4

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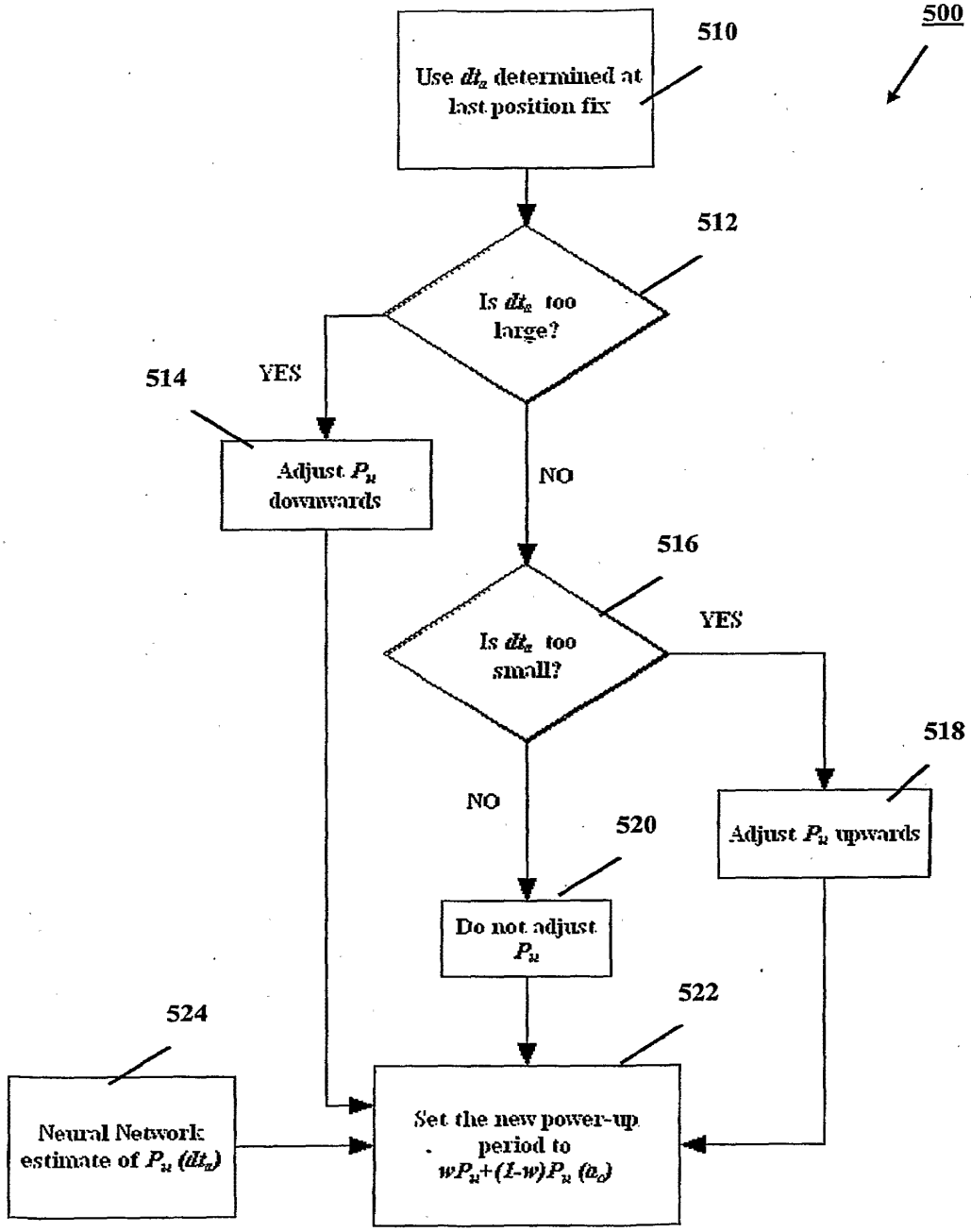


FIG. 5

[I:\ELEC\Unisearch\672078]672078_drwg_final.doc:SDB

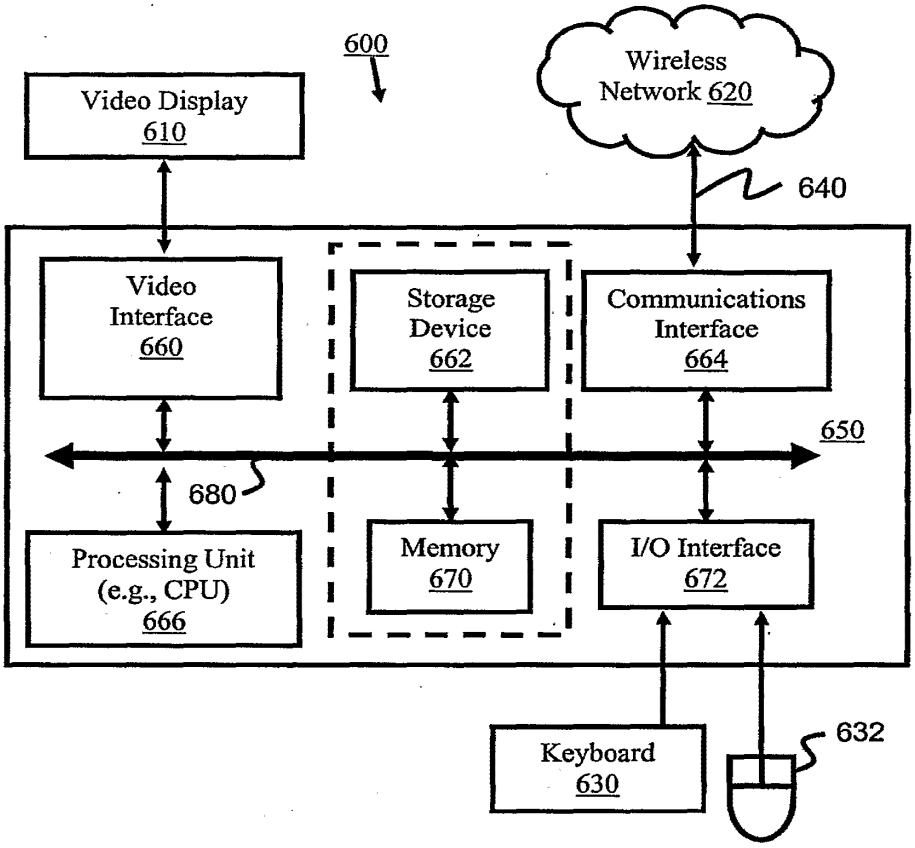


FIG. 6

[I:\ELEC\Unisearch\672078]672078_drwg_final.doc:SDB

REC'D 11 OCT 2006
WIPO PCT

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 672078C	**FOR FURTHER ACTION**	See Form PCT/IPEA/416
International application No. **PCT**/AU2005/001351	International filing date *(day/month/year)* 31 August 2005	Priority date *(day/month/year)* 2 September 2004

International Patent Classification (IPC) or national classification and IPC

Int. Cl.

G01S 5/00 (2006.01)

Applicant

MALANEY, Robert Anderson

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of **3** sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☐ *(sent to the applicant and to the International Bureau)* a total of sheets, as follows:
      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or table related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
3 July 2006	18 July 2006
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer **ATA MAQBOOL** Telephone No. (02) 6283 7905

Form PCT/IPEA/409 (Cover sheet) (April 2005)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/AU2005/001351

Box No. I Basis of the report

1. With regard to the **language,** this report is based on:

[X] The international application in the language in which it was filed

[ ] A translation of the international application into , which is the language of a translation furnished for the purposes of:

[ ] international search (under Rules 12.3(a) and 23.1 (b))

[ ] publication of the international application (under Rule 12.4(a))

[ ] international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

[ ] the international application as originally filed/furnished

[X] the description:

pages **1-18** as originally filed/furnished
pages* received by this Authority on with the letter of
pages* received by this Authority on with the letter of

[X] the claims:

pages as originally filed/furnished
pages* as amended (together with any statement) under Article 19
pages* **19-25** received by this Authority on **3 July 2006** with the letter of **3 July 2006**
pages* received by this Authority on with the letter of

[X] the drawings:

pages **1/6-6/6** as originally filed/furnished
pages* received by this Authority on with the letter of
pages* received by this Authority on with the letter of

[ ] a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. [ ] The amendments have resulted in the cancellation of:

[ ] the description, pages
[ ] the claims, Nos.
[ ] the drawings, sheets/figs
[ ] the sequence listing *(specify)*:
[ ] any table(s) related to the sequence listing *(specify)*:

4. [ ] This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

[ ] the description, pages
[ ] the claims, Nos.
[ ] the drawings, sheets/figs
[ ] the sequence listing *(specify)*:
[ ] any table(s) related to the sequence listing *(specify)*:

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

Box No. V **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	**1-40**	**YES**
	Claims		**NO**
Inventive step (IS)	Claims	**1-40**	**YES**
	Claims		**NO**
Industrial applicability (IA)	Claims	**1-40**	**YES**
	Claims		**NO**

2. Citations and explanations (Rule 70.7)

NOVELTY (N) & INVENTIVE STEP (IS)

The claims are considered novel and inventive over the cited prior art documents because none of the citations either individually or in obvious combination disclose the features of amended independent claims 1, 12 and 23. Furthermore it is accepted that none of the citations specifically teach the use of a "neural network' in estimating a new value for a power-up period as recited in independent claims 34 and 35.

The remaining claims being dependent from the above independent claims consequently also satisfy the requirements of novelty and inventive step.

Box No. VIII (iv) DECLARATION: INVENTORSHIP (only for the purposes of the designation of the United States of America)

The declaration must conform to the following standardized wording provided for in Section 214; see Notes to Boxes Nos. VIII, VIII (i) to (v) (in general) and the specific Notes to Box No. VIII (iv). If this Box is not used, this sheet should not be included in the request.

Declaration of inventorship (Rules 4.17(iv) and 51*bis*.1(a)(iv)) for the purposes of the designation of the United States of America:

I hereby declare that I believe I am the original, first and sole (if only one inventor is listed below) or joint (if more than one inventor is listed below) inventor of the subject matter which is claimed and for which a patent is sought.

This declaration is directed to the international application of which it forms a part (if filing declaration with application).

This declaration is directed to international application No. PCT/..... (if furnishing declaration pursuant to Rule 26*ter*).

I hereby declare that my residence, mailing address, and citizenship are as stated next to my name.

I hereby state that I have reviewed and understand the contents of the above-identified international application, including the claims of said application. I have identified in the request of said application, in compliance with PCT Rule 4.10, any claim to foreign priority, and I have identified below, under the heading "Prior Applications," by application number, country or Member of the World Trade Organization, day, month and year of filing, any application for a patent or inventor's certificate filed in a country other than the United States of America, including any PCT international application designating at least one country other than the United States of America, having a filing date before that of the application on which foreign priority is claimed.

Prior Applications: 2004905204 (AU).....

I hereby acknowledge the duty to disclose information that is known by me to be material to patentability as defined by 37 C.F.R. § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the PCT international filing date of the continuation-in-part application.

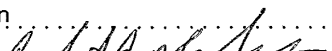
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, 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.

Name: MALANEY, Robert Anderson

Residence: East Lindfield, NSW, Australia
(city and either US state, if applicable, or country)

Mailing Address: 16 Carlyle Rd
East Lindfield, NSW 2070, Australia

Citizenship: Australian

Inventor's Signature: 
(if not contained in the request, or if declaration is corrected or added under Rule 26*ter* after the filing of the international application. The signature must be that of the inventor, not that of the agent)

Date: 29 August 2005
(of signature which is not contained in the request, or of the declaration that is corrected or added under Rule 26*ter* after the filing of the international application)

Name:

Residence:
(city and either US state, if applicable, or country)

Mailing Address:

Citizenship:

Inventor's Signature:
(if not contained in the request, or if declaration is corrected or added under Rule 26*ter* after the filing of the international application. The signature must be that of the inventor, not that of the agent)

Date:
(of signature which is not contained in the request, or of the declaration that is corrected or added under Rule 26*ter* after the filing of the international application)

☐ This declaration is continued on the following sheet, "Continuation of Box No. VIII (iv)".

Box No. VIII (ii) DECLARATION: ENTITLEMENT TO APPLY FOR AND BE GRANTED A PATENT

The declaration must conform to the standardized wording provided for in Section 212; see Notes to Boxes Nos. VIII, VIII (i) to (v) (in general) and the specific Notes to Box No. VIII (ii). If this Box is not used, this sheet should not be included in the request.

Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent (Rules 4.17(ii) and 51*bis*.1(a)(ii)), in a case where the declaration under Rule 4.17(iv) is not appropriate:

in relation to this international application,

MALANEY, Robert Anderson, is entitled to apply for and be granted a patent by virtue of the following:

an assignment from:

UNIVERSITY OF NEW SOUTH WALES, Sydney, NSW, Australia,

to MALANEY, Robert Anderson, dated 17 August 2005 (17.08.2005).

This declaration is made for the purposes of all designations.

☐ This declaration is continued on the following sheet, "Continuation of Box No. VIII (ii)".

Box No. VIII (iv) DECLARATION: INVENTORSHIP (only for the purposes of the designation of the United States of America)

The declaration must conform to the following standardized wording provided for in Section 214; see Notes to Boxes Nos. VIII, VIII (i) to (v) (in general) and the specific Notes to Box No. VIII (iv). If this Box is not used, this sheet should not be included in the request.

Declaration of inventorship (Rules 4.17(iv) and 51*bis*.1(a)(iv)) for the purposes of the designation of the United States of America:

I hereby declare that I believe I am the original, first and sole (if only one inventor is listed below) or joint (if more than one inventor is listed below) inventor of the subject matter which is claimed and for which a patent is sought.

This declaration is directed to the international application of which it forms a part (if filing declaration with application).

This declaration is directed to international application No. PCT/..... (if furnishing declaration pursuant to Rule 26*ter*).

I hereby declare that my residence, mailing address, and citizenship are as stated next to my name.

I hereby state that I have reviewed and understand the contents of the above-identified international application, including the claims of said application. I have identified in the request of said application, in compliance with PCT Rule 4.10, any claim to foreign priority, and I have identified below, under the heading "Prior Applications," by application number, country or Member of the World Trade Organization, day, month and year of filing, any application for a patent or inventor's certificate filed in a country other than the United States of America, including any PCT international application designating at least one country other than the United States of America, having a filing date before that of the application on which foreign priority is claimed.

Prior Applications: 2004905204 (AU)

I hereby acknowledge the duty to disclose information that is known by me to be material to patentability as defined by 37 C.F.R. § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the PCT international filing date of the continuation-in-part application.

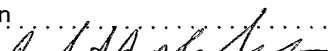
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, 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.

Name: MALANEY, Robert Anderson

Residence: East Lindfield, NSW, Australia
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Mailing Address: 16 Carlyle Rd
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Citizenship: Australian

Inventor's Signature: 
(if not contained in the request, or if declaration is corrected or added under Rule 26*ter* after the filing of the international application. The signature must be that of the inventor, not that of the agent)

Date: 29 August 2005
(of signature which is not contained in the request, or of the declaration that is corrected or added under Rule 26*ter* after the filing of the international application)

Name:

Residence:
(city and either US state, if applicable, or country)

Mailing Address:

Citizenship:

Inventor's Signature:
(if not contained in the request, or if declaration is corrected or added under Rule 26*ter* after the filing of the international application. The signature must be that of the inventor, not that of the agent)

Date:
(of signature which is not contained in the request, or of the declaration that is corrected or added under Rule 26*ter* after the filing of the international application)

☐ This declaration is continued on the following sheet, "Continuation of Box No. VIII (iv)".

IAP6 Rec'd PCT/PTO 07 MAY 2007

Practitioner's Docket No. U 016731-5

CHAPTER II

IN THE UNITED STATES ELECTED OFFICE (EO/US)

PCT/AU2005/001351	31 August 2005	2 September 2004
INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED

SELF MONITORING GPS ON MOBILE DEVICE
TITLE OF INVENTION

Robert Anderson MALANEY
APPLICANT(S)

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

ATTENTION: EO/US

AMENDMENT TRANSMITTAL

1. Transmitted herewith is an amendment for this application.

STATUS

2. The application is qualified as
   - ☒ a small entity.
   - ☐ other than a small entity.

CERTIFICATION UNDER 37 C.F.R. 1.10 *
*(Express Mail label number is **mandatory**.)*
(Express Mail certification is optional.)

I hereby certify that this correspondence and the documents referred to as attached therein are being deposited with the United States Postal Service on this date May 7, 2007, in an envelope as "Express Mail Post Office to Addressee", m ailing Label Number EV927569170US, addressed to the Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.

Geraldine Marti
(type or print name of person mailing paper)

Signature of person mailing paper

WARNING: *Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R. 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.*

WARNING:* *Each paper or fee filed by "Express Mail" **must have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. 1.10(b).*
*"Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will **not** be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.*

EXTENSION OF TERM

NOTE: "Extension of Time in Patent Cases (Supplement Amendments) — If a timely and complete response has been filed after a Non-Final Office Action, an extension of time is not required to permit filing and/or entry of an additional amendment after expiration of the shortened statutory period.

If a timely response has been filed after a Final Office Action, an extension of time is required to permit filing and/or entry of a Notice of Appeal or filing and/or entry of an additional amendment after expiration of the shortened statutory period unless the timely-filed response placed the application in condition for allowance. Of course, if a Notice of Appeal has been filed within the shortened statutory period, the period has ceased to run." Notice of December 10, 1985 (1061 O.G. 34-35).

NOTE: See 37 C.F.R. §1.645 for extensions of time in interference proceedings, and 37 C.F.R. § 1.550(c) for extensions of time in reexamination proceedings.

NOTE: 37 C.F.R. § 1.704(b)". . . an applicant shall be deemed to have failed to engage in reasonable efforts to conclude processing or examination of an application for the cumulative total of any periods of time in excess of three months that are taken to reply to any notice or action by the Office making any rejection, objection, argument, or other request, measuring such three-month period from the date the notice or action was mailed or given to the applicant, in which case the period of adjustment set forth in § 1.703 shall be reduced by the number of days, if any, beginning on the day after the date that is three months after the date of mailing or transmission of the Office communication notifying the applicant of the rejection, objection, argument, or other request and ending on the date the reply was filed. The period, or shortened statutory period, for reply that is set in the Office action or notice has no effect on the three-month period set forth in this paragraph."

3. The proceedings herein are for a patent application and the provisions of 37 C.F.R. 1.136 apply for a term of up to six (6) months.

(complete (a) or (b), as applicable)

(a) ☐ Applicant petitions for an extension of time under 37 C.F.R. 1.136 (fees: 37 C.F.R. 1.17(a)(1)-(4)) for the total number of months checked below:

	Extension (months)	Fee for other than small entity	Fee for small entity
☐	one month	$ 120.00	$ 60.00
☐	two months	$ 450.00	$ 225.00
☐	three months	$ 1,020.00	$ 510.00
☐	four months	$ 1,590.00	$ 795.00
☐	five months	$ 2,160.00	$ 1,080.00

Fee: $_____

If an additional extension of time is required, please consider this a petition therefor.

(check and complete the next item, if applicable)

☐ An extension for_____ months has already been secured. The fee paid therefor of $ _____ is deducted from the total fee due for the total months of extension now requested.

Extension fee due with this request $_____

OR

(b) ☒ Applicant believes that no extension of term is required. However, this is a conditional petition being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition for extension of time.

FEE FOR CLAIMS

4. The fee for claims (37 C.F.R. 1.16(b)-(d)) has been calculated as shown below:

	(Col. 1)		(Col. 2)	(Col. 3)	SMALL ENTITY			OTHER THAN A SMALL ENTITY	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra	Rate	Addit. Fee	*OR*	Rate	Addit. Fee
Total	* 36	Minus	** 20	= 16	x $ 25	$400		x $ 50=	$
Indep.	* 5	Minus	*** 3	= 2	x $ 100	$200		x $ 200	$
☐First Presentation of Multiple Dependent Claims					+ $180=	$		+ $360=	$
					Total Addit. Fee	$ 600	*OR*	Total Addit. Fee	$___

* If the entry in Col. 1 is less than the entry in Col. 2, write "0" in Col. 3,
** If the "Highest No. Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest No. Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest No. Previously Paid For" (Total or Indep.) is the highest number found in the appropriate box in Col. 1 of a prior amendment or the number of claims originally filed.

WARNING: *"After final rejection or action (§ 1.113) amendments may be made canceling claims or complying with any requirement of form which has been made." 37 C.F.R. 1.116(a) (emphasis added).*

05/09/2007 JBALINAN 00000124 11661707
01 FC:2615 400.00 DP
02 FC:2614 200.00 DP

Page 189 of 448 (IPR2023-01374)
Google LLC et al v. Nariste Networks Pty. Ltd.

FEE PAYMENT

5. ☐ No additional fee for claims is required.

OR

☒ Total additional fee for claims required $600.00

☒ Attached is a check in the sum of $600.00.

☐ Charge Account No. 12-0425 the sum of $ _____
A duplicate of this transmittal is attached.

FEE DEFICIENCY OR OVERPAYMENT

NOTE: If there is a fee deficiency and there is no authorization to charge an account, additional fees are necessary to cover the additional time consumed in making up the original deficiency. If the maximum, six-month period has expired before the deficiency is noted and corrected, the application is held abandoned. In those instances where authorization to charge is included, processing delays are encountered in returning the papers to the PTO Finance Branch in order to apply these charges prior to action on the cases. Authorization to charge the deposit account for any fee deficiency should be checked. See the Notice of April 7, 1986, (1065 O.G. 31-33).

6. ☒ If any additional extension and/or fee is required, charge Account No12-0425.

AND/OR

☒ If any additional fee for claims is required, charge Account No. 12-0425

AND/OR

☒ Refund any overpayment to Account No.12-0425.

Reg. No.:

Tel. No.: ( )

SIGNATURE OF PRACTITIONER

William R. Evans, 25858, (212) 708-1930

(type or print name of practitioner)

P.O. Address

c/o Ladas & Parry LLP
26 West 61st Street
New York, N.Y. 10023

Customer No.:
00140
PATENT TRADEMARK OFFICE

Practitioner's Docket No. U 016731-5

CHAPTER II

IN THE UNITED STATES ELECTED OFFICE (EO/US)

PCT/AU2005/001351	31 August 2005	2 September 2004
INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED

SELF MONITORING GPS ON MOBILE DEVICE
TITLE OF INVENTION

Robert Anderson MALANEY
APPLICANT(S)

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

ATTENTION: EO/US

PRELIMINARY AMENDMENT

Please amend the above application as follows:

CERTIFICATION UNDER 37 C.F.R. 1.10 *
*(Express Mail label number is **mandatory**.)*
(Express Mail certification is optional.)

I hereby certify that this correspondence and the documents referred to as attached therein are being deposited with the United States Postal Service on this date May 7, 2007, in an envelope as "Express Mail Post Office to Addressee", m ailing Label Number EV927569170US, addressed to the Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.

Geraldine Marti
(type or print name of person mailing paper)

Signature of person mailing paper

WARNING: *Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R. 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.*

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IN THE SPECIFICATION

Please replace the paragraph beginning at page 9, line 27, with:

A flow chart of a method 300 to determine and store P_u, dt_{ta}, and e_p is depicted in Fig. 3. Processing commences in step 310 in which the last N positions reported are used to predict the next position at the next scheduled power-up time. That is, given the past position history stored in the mobile device, an adaptive algorithm predicts the next position value. A number of techniques are known for predicting the next position of a mobile device based on its past history of positions, such as regression, Kalman filter, particle filter. In step 320, at the next power-up time, the predicted position of the GPS-enabled mobile device is compared with the actual position of the mobile device, and the position error e_p is determined. Thus, given a predicted value of the position, the predicted value is checked against the actual position location reported the next time the GPS device is powered on to form the prediction error e_p . In step 330, the current values of the period of the power-up phase P_u, acquisition time d_{ta}, and prediction error e_p are stored. This information may be stored in the memory of the wireless device or other suitable storage device. Processing then terminates. The mobile device itself can time how long it took (from the onset of power up) to obtain a GPS fix - this is the acquisition time. If GPS position is unavailable at a particular epoch, nothing is recorded.

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Please replace the paragraph beginning at page 10, line 13, with:

The foregoing method uses the stored position error values e_p to determine how best to set the value of P_u given an acceptable error bound a_c. A system can thus be designed that adaptively determines the best functional fit to the function $P_u(e_p)$. In one embodiment, a technique based on neural networks 200 can be used for .the determination of $P_u(e_p)$. Given the current best estimate of this function and the acceptable error bound a_c, the value of P_u can be then set using $P_u(a_c)$. In addition, a weighted contribution of $P_u(a_c)$ can be allowed for to be used in setting the new power-up period. A separate algorithm checks whether the current power-up period is too large or too small, and if so adjusts P_u accordingly. The new power-up period can then be set as $wP_u + (1-w) P_u(a_c)$, where w is a weighting factor in the range 0- 1.

Please replace the paragraph beginning at page 11, line 11, with:

In decision step 416, a check is made to determine if the stored position error values e_p is too small. In one embodiment, the term "too small" means e_p is smaller than $0.5\ a_c$. However, variations on this in terms of some other fraction of a_c can also be used. If decision step 416 returns true (Yes), processing continues at step 418. In step 418, the current value of the power-up period P_u is adjusted upwards. That is, the value of P_u is increased to a new value. The new value may be calculated as bP_u, where b is set at 1.5. Once again, different values of b or different increase algorithms may be practiced. The new power-up period has a maximum threshold value ~~below~~above which it cannot be set. This threshold value may be ten minutes, for example, but this can be set by the user *a priori*. From step 418, processing continues at step 422. If decision step 416 returns false (No), processing continues at step 420.

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Google LLC et al v. Nariste Networks Pty. Ltd.

Please replace the paragraph beginning at page 12, line 3, with:

If position accuracy is the sole criteria dictating the value of P_u, the above process would suffice. However, if the acquisition time is the sole criteria dictating the value of P_u, the process 500 depicted in the flowchart described in Fig. 5 would suffice. This process 500 is similar to that 400 given above, except that the acquisition time dt_{pa} is used to determine the new power-up period. It is the comparison of dt_{pa} with the pre-assigned value for the bound on acquisition time that is used in decision making process. In step 510, the stored acquisition time dt_{pa} is used to determine the last position fix. In decision step 512, a check is made to determine if the stored acquisition time dt_{pa} is too large. In Fig. 5, ac is now the acceptable error on acquisition time. The term "too large" means that dt_a is larger than a_c. Variations on this in terms of some fraction or multiple of a_c can also be used. If decision step 512 returns true (Yes), processing continues at step 514. In step 514, the current values of P_u is adjusted down. Thus, if dt_a is too large, the value of P_u is reduced to a new value. The new value may be set to cP_u, where c is set at 0.5. Different values of c or different reduction algorithms may be used. Again, a minimum value of the power-up period is imposed. Processing continues from step 514 at step 522. Otherwise, if decision step 512 returns false (No), processing continues at step 516.

Please replace the paragraph beginning at page 12, line 20, with:

In decision step 516, a check is made to determine if the stored acquisition time dt_{pa} is too small. The term "too small" means that dt_a is smaller than $0.5a_c$. Variations on this in terms of some other fraction of a_c can also be used. If decision step 516 returns true (Yes); processing continues at step 518. In step 518, the current value of P_u is adjusted upwards.

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Google LLC et al v. Nariste Networks Pty. Ltd.

Thus, if dt_a is too small, the value of P_u is increased to a new value. The new value of the power-up period may be set to bP_u, where b is set at 1.5. Different values of b or different increase algorithms may be used. Again a maximum value of the power-up period is imposed. From step 518, processing continues at step 522. If decision step 516 returns false (No), processing continues at step 520.

Please replace the paragraph beginning at page 13, line 3, with:

In step 520, the current value of the power-up period P_u is not changed, that is, it is maintained at the same value. Processing then continues at step 522.. In step 522, the new power-up period is set to $wP_u + (1 - w)P_u(a_c)$. In step 524, a neural network estimate of $P_{u(}dt_{\underline{pa}})$ is provided to step 522. A weighted average of these two independent values is then used to set the final new power-up period as $wP_u + (1 - w)P_u(a_c)$, where a_c is again the acceptable error bound on the acquisition time. The value of w is set *a priori* by the manufacturer or user. In a variant of this process w can be made time dependent. That is, separate from the above steps, a neural network 200 estimate of the function $P_u(dt_{\underline{pa}})$ is made based on the stored values of P and $dt_{\underline{pa}}$. From step 522, processing terminates.

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Google LLC et al v. Nariste Networks Pty. Ltd.

IN THE CLAIMS

1. (previously presented) A method of acquiring GPS on a mobile device for a wireless network, said mobile device possessing GPS capability and wireless communications capability for said wireless network, said method comprising the step of:

setting a current value of the period of the power-up phase of said GPS dependent on information on the radio position of the mobile device in the wireless network determined from the wireless network and adaptive predictions of when said GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time, said specifications being statistical bounds.

2. (previously presented) The method according to claim 1, wherein setting said current value is also dependent upon Cramer-Rao Bound information on the radio position.

3. (previously presented) The method according to claim 1, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable statistical bounds.

4. (previously presented) The method according to claim 1, wherein said mobile device determines dynamically an optimal period of the power-up phase.

5. (previously presented) The method according to claim 1, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

6. (previously presented) The method according to claim 5, wherein said adaptive-filter and machine learning techniques are implemented using said mobile device.

7. (previously presented) The method according to claim 1, wherein said setting step comprises:

if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

if at least one of predicted accuracy error and predicted acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

8. (previously presented) The method according to claim 1, wherein said mobile device comprises a power limited device.

9. (previously presented) The method according to claim 1, wherein said mobile device comprises an embedded GPS device.

10. (previously presented) The method according to claim 1, comprising the step of making adaptive predictions using a neural network.

11. (previously presented) The method according to claim 1, wherein said setting step comprises:

predicting a next position a next scheduled power-up time using a number of last positions reported;

comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

storing current values of period of the power-up phase, acquisition time, position error and position in a storage unit of said mobile device.

12. (previously presented) A mobile device for a wireless network, said mobile device possessing wireless communications capability for said wireless network, comprising:

a processor and memory coupled to said processor;

a GPS module coupled to said processor providing a GPS capability for said mobile device; and

means for setting a current value of the period of the power-up phase of said GPS dependent on information on the radio position of the mobile device in the wireless network determined from the wireless network and adaptive predictions of when said GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time, said specifications being statistical bounds.

13. (previously presented) The mobile device according to claim 12, wherein setting said current value is also dependent upon Cramer-Rao Bound information on the radio position.

14. (previously presented) The mobile device according to claim 12, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable statistical bounds.

15. (previously presented) The mobile device according to claim 12, wherein said mobile device determines dynamically an optimal period of the power-up phase.

16. (previously presented) The mobile device according to claim 12, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

17. (previously presented) The mobile device according to claim 16, wherein said adaptive-filter and machine -learning techniques are implemented using said mobile device.

18. (previously presented) The mobile device according to claim 12, wherein said setting means comprises:

means for, if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

means for, if at least one of predicted accuracy error and predicted acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

19. (previously presented) The mobile device according to claim 12, wherein said mobile device comprises a power limited device.

20. (previously presented) The mobile device according to claim 19, further comprising a battery for powering said mobile device.

21. (previously presented) The mobile device according to claim 12, comprising a neural network module for making adaptive predictions.

22. (previously presented) The mobile device according to claim 12, wherein said setting means comprises:

means for predicting a next position a next scheduled power-up time using a number of last positions reported;

means for comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

means for storing current values of a period of the power-up phase, acquisition time, position error and position in a storage unit of said mobile device.

23. (previously presented) A computer program product for a mobile device for a wireless network, said mobile device possessing GPS capability and wireless communications capability for said wireless network, said computer program product having a computer readable medium storing a computer program for acquiring GPS on said mobile device, comprising:

computer program code means for interfacing with the GPS capability of said mobile device; and

computer program code means for setting a current value of the period of the power-up phase of said GPS dependent on information on the radio position of the mobile device in the wireless network determined from the wireless network and adaptive predictions of when said GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time, said specifications being statistical bounds.

24. (previously presented) The computer program product according to claim 23, wherein setting said current value is also dependent upon Cramer-Rao Bound information on the radio position.

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Google LLC et al v. Nariste Networks Pty. Ltd.

25. (previously presented) The computer program product according to claim 23, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable statistical bounds.

26. (previously presented) The computer program product according to claim 23, wherein said computer program product determines dynamically an optimal period of the power-up phase.

27. (previously presented) The computer program product according to claim 23, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

28. (previously presented) The computer program product according to claim 27, wherein said adaptive-filter and machine learning techniques are implemented using said mobile device.

29. (previously presented) The computer program product according to claim 23, wherein said computer program code means for setting comprises:

computer program code means for, if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

computer program code means for, if at least one of predicted accuracy error and predicted acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

30. (previously presented) The computer program product according to claim 23, wherein said mobile device comprises a power limited device.

31. (previously presented) The computer program product according to claim 30, wherein said mobile device comprises a battery for powering said mobile device.

32. (previously presented) The computer program product according to claim 23, comprising computer program code means for providing a neural network module to make adaptive predictions.

33. (previously presented) The computer program product according to claim 23, wherein said computer program code means for setting comprises:

computer program code means for predicting a next position a next scheduled power-up time using a number of last positions reported;

computer program code means for comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

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Google LLC et al v. Nariste Networks Pty. Ltd.

computer program code means for storing current values of a period of the power-up phase, acquisition time, position error and position in a storage unit of said mobile device.

34. (previously presented) A method of acquiring GPS on a mobile device for a wireless network, said mobile device possessing GPS capability and wireless communications capability for said wireless network, said method comprising the steps of:

using a position error of said mobile device in the wireless network determined from the wireless network;

if the position error is too large, adjusting a current value of the period of the power-up phase of said GPS downward;

if the position error is too small, adjusting the current value of said period of the power-up phase of said GPS upward;

estimating using a neural network a new value of said period of the power-up phase of said GPS dependent upon said position error; and

setting a new value of said period of the power-up phase of said GPS to a weighted value dependent upon an acceptable error bound.

35. (previously presented) A method of acquiring GPS on a mobile device for a wireless network, said mobile device possessing GPS capability and wireless communications capability for said wireless network, said method comprising the steps of:

using an acquisition time at a last position fix of the mobile device in the wireless network determined from the wireless network;

if the acquisition time is too large, adjusting a current value of the period of the power-up phase of said GPS downward;

if the acquisition time is too small, adjusting the current value of said period of the power-up phase of said GPS upward;

estimating using a neural network a new value of said period of the power-up phase of said GPS dependent upon said acquisition time; and

setting a new value of said period of the power-up phase of said GPS to a weighted value dependent upon an acceptable bound.

36. (previously presented) The method according to claim 34, wherein the position error is the Cramer-Rao Bound on the radio position of the mobile device.

37. - 40. (canceled)

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Google LLC et al v. Nariste Networks Pty. Ltd.

REMARKS'

The specification is edited. A change to page 10 is supported on pages 11 and 13, for example.

It is believed that the International Preliminary Examination Report (copy attached) is in error in identifying claims pages 19 - 25, but failing to attach these as annexes.

Nevertheless, the applicant understands the Report to have entered the claims as above, with claim cancellation to avoid claim fees.

Respectfully submitted,

William R. Evans
c/o Ladas & Parry LLP
26 West 61st Street
New York, New York 10023
Reg. No. 25858
Tel. No. (212) 708-1930

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 11 OCT 2006
WIPO PCT

Applicant's or agent's file reference 672078C	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/AU2005/001351	International filing date *(day/month/year)* 31 August 2005	Priority date *(day/month/year)* 2 September 2004

International Patent Classification (IPC) or national classification and IPC

Int. Cl.

G01S 5/00 (2006.01)

Applicant

MALANEY, Robert Anderson

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☐ *(sent to the applicant and to the International Bureau)* a total of sheets, as follows:
      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or table related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
3 July 2006	18 July 2006
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer **ATA MAQBOOL** Telephone No. (02) 6283 7905

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/AU2005/001351

Box No. I Basis of the report

1. With regard to the **language**, this report is based on:

[X] The international application in the language in which it was filed

[ ] A translation of the international application into , which is the language of a translation furnished for the purposes of:

[ ] international search (under Rules 12.3(a) and 23.1 (b))

[ ] publication of the international application (under Rule 12.4(a))

[ ] international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

[ ] the international application as originally filed/furnished

[X] the description:

pages **1-18** as originally filed/furnished
pages* received by this Authority on with the letter of
pages* received by this Authority on with the letter of

[X] the claims:

pages as originally filed/furnished
pages* as amended (together with any statement) under Article 19
pages* **19-25** received by this Authority on **3 July 2006** with the letter of **3 July 2006**
pages* received by this Authority on with the letter of

[X] the drawings:

pages **1/6-6/6** as originally filed/furnished
pages* received by this Authority on with the letter of
pages* received by this Authority on with the letter of

[ ] a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. [ ] The amendments have resulted in the cancellation of:

[ ] the description, pages
[ ] the claims, Nos.
[ ] the drawings, sheets/figs
[ ] the sequence listing *(specify)*:
[ ] any table(s) related to the sequence listing *(specify)*:

4. [ ] This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

[ ] the description, pages
[ ] the claims, Nos.
[ ] the drawings, sheets/figs
[ ] the sequence listing *(specify)*:
[ ] any table(s) related to the sequence listing *(specify)*:

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/AU2005/001351

Box No. V **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-40	**YES**
	Claims		**NO**
Inventive step (IS)	Claims	1-40	**YES**
	Claims		**NO**
Industrial applicability (IA)	Claims	1-40	**YES**
	Claims		**NO**

2. Citations and explanations (Rule 70.7)

NOVELTY (N) & INVENTIVE STEP (IS)

The claims are considered novel and inventive over the cited prior art documents because none of the citations either individually or in obvious combination disclose the features of amended independent claims 1, 12 and 23. Furthermore it is accepted that none of the citations specifically teach the use of a "neural network' in estimating a new value for a power-up period as recited in independent claims 34 and 35.

The remaining claims being dependent from the above independent claims consequently also satisfy the requirements of novelty and inventive step.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. 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	Filing Date	☐ To be Mailed
11/661,707	02/11/2008	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☒ RATE ($)	SMALL ENTITY ☒ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ 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), (i), 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

AMENDMENT 05/07/2007	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 36	Minus	** 36	= 0	X $25 =	0	OR	X $ =	
Independent (37 CFR 1.16(h))	* 9	Minus	***9	= 0	X $100 =	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	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) 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:
/ANDREW JAMES JR/

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.

IAP12 Rec'd PCT/PTO 09 OCT 2007

Practitioner's Docket No. U 015608-9

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CHAPTER II

IN THE UNITED STATES ELECTED OFFICE (EO/US)

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/AU2005/001351	31 AUGUST 2005	2 SEPTEMBER 2004

TITLE OF INVENTION

SELF MONITORING GPS ON MOBILE DEVICE

APPLICANT(S)

Robert Anderson **MALANEY**

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

ATTENTION: DO/US

Optional Customer No. Bar Code

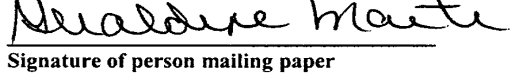
00140
PATENT TRADEMARK OFFICE

TRANSMITTAL OF INFORMATION DISCLOSURE STATEMENT WITHIN THREE MONTHS OF FILING OR BEFORE MAILING OF FIRST OFFICE ACTION (37 C.F.R. 1.97(b))

CERTIFICATION UNDER 37 C.F.R. 1.10*
*(Express Mail label number is **mandatory.**)*
(Express Mail certification is optional.)

I hereby certify that this paper, along with any document referred to, is being deposited with the United States Postal Service on this date October 9, 2007, in an envelope as Express Mail Post Office to Addressee," mailing Label Number EV 927571071 US, addressed to the: Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.

GERALDINE MARTI
(type or print name of person mailing paper)



Signature of person mailing paper

WARNING: *Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.*

***WARNING:** *Each paper or fee filed by "Express Mail" **must** have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R 1.10(b).*

*"Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will **not** be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.*

NOTE: 37 C.F.R. 1.98(b):

(1) Each U.S. patent listed in an information disclosure statement must be identified by inventor, patent number, and issue date.

(2) Each U.S. patent application published listed in an information disclosure statement shall be identified by applicant, patent application publication number, and publication date.

(3) Each U.S. application listed in an information disclosure statement must be identified by the inventor, application number, and filing date.

(4) Each foreign patent or published foreign patent application listed in an information disclosure statement must be identified by the country or patent office which issued the patent or published the application, an appropriate document number, and the publication date indicated on the patent or published application.

(5) Each publication listed in an information disclosure statement must be identified by publisher, author (if any), title, relevant pages of the publication,,date, and place of publication.

WARNING: *No extension of time can be had under 37 C.F.R. § 1.36 (a) or (b) for filing an IDS. 37 C.F.R. § 1.97(f).*

NOTE: The "filing date of a national application" under 37 C.F.R. 1.97(b) has two possible meanings. Where the filing is a direct one to the United States Patent & Trademark office, the filing is defined in 37 C.F.R. 1.53(b) as "the date on which: (1) A specification containing a description pursuant to § 1.71 and at least one claim pursuant to § 1.75; and (2) any drawing required by § 1.81(a), are filed in the Patent and Trademark Office in the name of the actual inventor or inventors as required by § 1.41." 37 C.F.R. 1.97(b)(1). On the other hand, an international application that enters the national stage occurs when the applicant has filed the documents and fees required by 35 U.S.C. § 371(c) within the periods set forth in § 1.494 or § 1.495. 35 U.S.C. § 371(c) requires the filing of the following: (1) the national fee; (2) a copy of the international application, unless already sent by the International Bureau, and an English translation if filed in another language; (3) amendments under PCT Article 19, with a translation into English if made in another language; (4) an oath or declaration; and (5) a translation into English of any annexes to the international preliminary examination report, if such annexes were made in another language. 37 C.F.R. 1.97(b)(2).

IDENTIFICATION OF TIME OF FILING THE ACCOMPANYING INFORMATION DISCLOSURE STATEMENT

The information disclosure statement submitted herewith is being filed within three months of the filing date of the application or date of entry into the national stage of an international application or before the mailing date of a first Office action on the merits, whichever event occurs last. 37 C.F.R. 1.97(b).

NOTE: "No certification or fee is due when the filing is made within the above time period. It is advisable to ensure that no Office action has been mailed if the disclosure statement is delayed until after three months from filing."

NOTE: "An information disclosure statement will be considered to have been filed on the day it was received in the Office, or on an earlier date of a mailing if accompanied by a properly executed certificate of mailing under 37 C.F.R. 1.8, or Express Mail certificate under 37 C.F.R. 1.10. An office action is mailed on the date indicated in the Office action." Notice of April 20, 1992 (1138 O.G. 37-41, 39).

NOTE: "The term 'national application' includes continuing applications (continuations, divisions, continuations-in-part) so three-months will be measured from the actual filing date of an application as opposed [sic] to the effective date of a continuing application." Notice of April 20, 1992 (1138 O.G. 37-41, 39).

NOTE: *"An action on the merits means an action which treats the patentability of the claims in an application, as opposed to only formal or procedural requirements. An action on the merits would, for example, contain a rejection or indication of allowability of a claim or claims rather than just a restriction requirements (37 C.F.R. 1.142) or just a requirement for additional fees to have a claim considered (37 C.F.R. 1.16(d)). Thus, if an application was filed on Jan. 1 and the first Office action on the merits was not mailed until six months later on July 1, the examiner would be required to consider any proper information disclosure statement filed prior to July 1." Notice of April 20, 1992 (1138 O.G. 37-41, 39).*

WARNING: *"A petition for suspension of action to allow applicant time to submit an information disclosure statement will be denied as failing to present good and sufficient reasons, since 37 C.F.R. 1.97 provides adequate recourse for the timely submission of prior art for consideration by the examiner." Notice of July 6, 1992 (1141 O.G. 63). But see § 103(b) and (c), limited suspension of action in a continued prosecution application (CPA) filed under § 1.53(d) and in a request for continued examination (RCE) under § 1.114.*

If a fee is required, please charge deposit account 12-0425.



SIGNATURE OF PRACTITIONER

WILLIAM R. EVANS

(type or print name of practitioner)

P.O. Address

c/o Ladas & Parry LLP
26 West 61st Street
New York, N.Y. 10023

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Customer No.: 00140

EXPRESS MAIL LABEL EV 927571071 US

Page 213 of 448 (IPR2023-01374)
Google LLC et al v. Nariste Networks Pty. Ltd.

Practitioner's Docket No. U 015608-9

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CHAPTER II

IN THE UNITED STATES ELECTED OFFICE (EO/US)

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/AU2005/001351	31 AUGUST 2005	2 SEPTEMBER 2004

TITLE OF INVENTION

SELF MONITORING GPS ON MOBILE DEVICE

APPLICANT(S)

Robert Anderson **MALANEY**

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

ATTENTION: DO/US

Optional Customer No. Bar Code

00140
PATENT TRADEMARK OFFICE

INFORMATION DISCLOSURE STATEMENT

We draw the attention of the Examiner to the attached references (first page only for U.S. patent publications) which are also listed on the attached Form PTO-1449.

CERTIFICATION UNDER 37 C.F.R. 1.10*
*(Express Mail label number is **mandatory.**)*
(Express Mail certification is optional.)

I hereby certify that this paper, along with any document referred to, is being deposited with the United States Postal Service on this date October 9, 2007, in an envelope as Express Mail Post Office to Addressee," mailing Label Number EV 927571071 US, addressed to the: Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.

GERALDINE MARTI
(type or print name of person mailing paper)

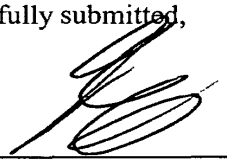
Signature of person mailing paper

WARNING: *Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.*

***WARNING:** Each paper or fee filed by "Express Mail" **must** have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R 1.10(b).*

*"Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will **not** be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.*

Respectfully submitted,



WILLIAM R. EVANS
LADAS & PARRY LLP
26 WEST 61ST STREET
NEW YORK, NEW YORK 10023
REG.NO.25,858; (212)708-1930

Express Mail Label Number: EV 927571071 US

Page 215 of 448 (IPR2023-01374)
Google LLC et al v. Nariste Networks Pty. Ltd.

FORM PTO-1449 U. S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)	ATTY. DOCKET NO.	SERIAL NO.
	U 016731-5	**11/661,707**
	APPLICANT	
	Robert Anderson MALANEY	
	FILING DATE	GROUP
	March 1, 2007	

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	REFERENCE DESIGNATION	DOCUMENT NUMBER	DATE	NAME	FILING DATE IF APPROPRIATE
	AA	2002/0091956	07/2002	Potter, et al.	
	AB				
	AC				
	AD				
	AE				
	AF				
	AG				
	AH				
	AI				
	AJ				
	AK				

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION	
					YES	NO
	AL					
	AM					
	AN					
	AO					
	AP					

OTHER ART (Including Author, Title, Date, Pertinent Dates, Etc.)

	AR	"How A-GPS Works" (2001) SnapTrack, A QUALCOMM Company, White Paper (http://www.snaptrack.com/pdf/How_aGPS_works.pdf)
	AS	"TricklePower" in REFERENCE GUIDELINE TO TF GPS ENGINE BOARD by Laipac Technology, Inc. (2001) (http:///www.laipac.com/datasheets/gps/TF%20GPS%20Series.pdf)
	AT	

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if citation 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.

Form PTO-1449 6-4

DO/ EO WORKSHEET

Shelby Vigil, Patent Application Specialist/ National Stage Division

U.S. Appl. No. 11/661,707 International Appl. No. PCT/AU05/01357

Application filed by : ☐ 20 months ☑ 30 months

WIPO PUBLICATION INFORMATION :

Publication No.: WO2006/024112 Publication Language : ☑ English ☐ German ☐ Japanese ☐ Chinese ☐ Korean ☐ French ☐ Spanish ☐ Russian ☐ Other : _____

Publication Date : 3 / 9 / 2006 Not Published : ☐ U.S. only designated ☐ EP request Published : ☐ EP request

INTERNATIONAL APPLICATION PAPERS IN THE APPLICATION FILE :

- ☑ International Application *(RECORD COPY)*
- ☐ Article 19 Amendments
- ☑ PCT/IPEA/409 IPER : ☐ EP ☐ JP ☐ SE ☑ AU ☐ US ☐ FR ☐ CN ☐ ES ☐ RU ☐ AT ☐ KR ☐ ___
- ☐ Annexes to 409
- ☐ PCT/ISA/237 : ☐ EP ☐ JP ☐ SE ☐ AU ☐ US ☐ FR ☐ CN ☐ ES ☐ RU ☐ AT ☐ KR ☐ ___
  - ☐ PCT/IPEA/409 or PCT/ISA/237 was NOT AVAILABLE at the time of paralegal review
- ☐ PCT/IB/306
- ☐ Request form PCT/RO/101
- ☑ PCT/ISA/210 - Search Report : ☐ EP ☐ JP ☐ SE ☑ AU ☐ US ☐ FR ☐ CN ☐ ES ☐ RU ☐ AT ☐ KR ☐ ___ ☐ NONE
- ☐ Search Report References
- ☑ Priority Document (s) No. 1
  - ☐ N/A
  - ☐ Priority Document was NOT AVAILABLE at the time of paralegal review
- ☑ Other : 304,306,401

RECEIPTS FROM THE APPLICANT *(other than checked above) :*

- ☑ Basic National Fee *(or authorization to charge)*
- ☑ Description ☐ Claims ☐ Abstract
- ☑ Drawing Figure(s) - (# of drwgs. 6)
- ☐ Translation of Article 19 Amendments ☐ entered ☐ not entered :
  - ☐ not a page for page substitution
  - ☐ replaced by Article 34 Amendment
- ☑ Annexes to 409 ☑ entered ☐ not entered :
  - ☐ not a page for page substitution
  - ☐ no translation ☐ other : _____
- ☐ Application Data Sheet
- ☐ Power of Attorney
- ☐ Change of Address
- ☑ Preliminary Amendment(s) Filed on : not entered 1. ☐ same as 371 request date 2. 5/7/07 3. _____
- ☑ Information Disclosure Statement(s) Filed on : 1. ☐ same as 371 request date 2. 10/9/07 3. _____
- ☐ Assignment Document (forwarded to Assignment Branch)
- ☐ Assignee Statement Under 37 CFR 3.73(b)
- ☐ Assignee PG Publication Notice
- ☐ Substitute Specification Filed on : 1. ☐ same as 371 request date 2. _____ 3. _____
- ☑ Verified Small Status Statement
- ☐ Oath/ Declaration (executed)
- ☐ Oath/ Declaration ☐ unsigned ☐ no citizenship ☐ other
- ☐ DNA Diskette ☐ Sequence Listing
- ☐ Other : _____

NOTES : ☐ I.A. used as Specification ☐ Other :

35 U.S.C. 371 - Receipt of Request (PTO-1390)	mo. 3 / day 1 / yr. 2007 EP,
Date Acceptable Oath/ Declaration Received	☐ Same as 371 Req. Date; ☐ mo. / day / yr. 200
Date of Completion of requirements under 35 U.S.C. 371	☐ Same as 371 Req. Date; ☐ Same as OATH Date; ☐ mo. / day / yr. 200
Date of Completion of DO/ EO 903 - Notification of Acceptance	
Date of Completion of DO/ EO 905 - Notification of Missing Requirements	
Date of Completion of DO/ EO 909 - Notification of Abandonment	
Date of Completion of DO/ EO 916 - Notification of Defective Response	
Date of Completion of DO/ EO 922 - Notification to Comply w/ Requirements for Patent Applications Containing Nucleotide and/or Amino Acid Sequence Disclosures	
Date of Completion of DO/ EO 923	

PATENT APPLICATION FEE DETERMINATION RECORD

Effective December 8, 2004

Application or Docket Number: 11661707

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)	SMALL ENTITY TYPE ☐		OR	OTHER THAN SMALL ENTITY	
			RATE	FEE		RATE	FEE
U.S. NATIONAL STAGE FEES							
BASIC FEE	SMALL ENT. = $ 150	LARGE ENT. = $ 300	BASIC FEE	150	OR	BASIC FEE	
EXAMINATION FEE	Satisfies PCT Article 33(1)-(4) = $ 50 / $ 100	All other situations = $ 100 / $ 200	EXAM. FEE	100		EXAM. FEE	
SEARCH FEE	U.S. is ISA = $ 50 / $ 100 ALL other countries = $ 200 / $ 400	ALL other situations = $ 250 / $ 500	SEARCH FEE	200		SEARCH FEE	
FEE FOR EXTRA SPEC. PGS.	minus 100 =	/ 50 =	X $ 125 =			X $ 250 =	
TOTAL CHARGEABLE CLAIMS	36 minus 20 =	* 16	X $ 25 =	400	OR	X $ 50 =	
INDEPENDENT CLAIMS	6 minus 3 =	* 3	X $ 100 =	300	OR	X $ 200 =	
MULTIPLE DEPENDENT CLAIM PRESENT ☐			+ $ 180 =		OR	+ $ 360 =	
* If the difference in column 1 is less than zero, enter "0" in column 2			TOTAL		OR	TOTAL	

CLAIMS AS AMENDED - PART II

AMENDMENT A

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE	SMALL ENTITY ADDI-TIONAL FEE	OR	OTHER THAN SMALL ENTITY RATE	OTHER THAN SMALL ENTITY ADDI-TIONAL FEE
Total	*	Minus	**	=	X $ 25 =		OR	X $ 50 =	
Independent	*	Minus	***	=	X $ 100 =		OR	X $ 200 =	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐					+ $ 180 =		OR	+ $ 360 =	
					TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT B

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE	ADDI-TIONAL FEE	OR	RATE	ADDI-TIONAL FEE
Total	*	Minus	**	=	X $ 25 =		OR	X $ 50 =	
Independent	*	Minus	***	=	X $ 100 =		OR	X $ 200 =	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM ☐					+ $ 180 =		OR	+ $ 360 =	
					TOTAL ADDIT. FEE		OR	TOTAL ADDIT. 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.

MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET (FOR USE WITH FORM PTO-875)	SERIAL NO. 11661707	FILING DATE
	APPLICANT(S)	

CLAIMS

	AS FILED		AFTER 1ST AMENDMENT		AFTER 2ND AMENDMENT			AS FILED		AFTER 1ST AMENDMENT		AFTER 2ND AMENDMENT	
	IND.	DEP.	IND.	DEP.	IND.	DEP.		IND.	DEP.	IND.	DEP.	IND.	DEP.
1	1						51						
2							52						
3							53						
4							54						
5							55						
6							56						
7							57						
8							58						
9							59						
10							60						
11	1						61						
12							62						
13							63						
14							64						
15							65						
16							66						
17							67						
18							68						
19							69						
20							70						
21	1						71						
22							72						
23							73						
24							74						
25							75						
26							76						
27							77						
28							78						
29							79						
30							80						
31	1						81						
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49							99						
50							100						
TOTAL IND.	9						TOTAL IND.						
TOTAL DEP.	27						TOTAL DEP.						
TOTAL CLAIMS	36						TOTAL CLAIMS						

PTO - 1360 (REV. 11/04)

U.S. DEPARTMENT of COMMERCE
Patent and Trademark Office

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

U.S. APPLICATION NUMBER NO.	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
11/661,707	Robert Anderson Malaney	U 016731-5

140
LADAS & PARRY
26 WEST 61ST STREET
NEW YORK, NY 10023

INTERNATIONAL APPLICATION NO.	
PCT/AU05/01351	
I.A. FILING DATE	PRIORITY DATE
08/31/2005	09/02/2004

CONFIRMATION NO. 9076
371 FORMALITIES LETTER

OC000000027834814

Date Mailed: 01/24/2008

NOTIFICATION OF MISSING REQUIREMENTS UNDER 35 U.S.C. 371 IN THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US)

The following items have been submitted by the applicant or the IB to the United States Patent and Trademark Office as an Elected Office (37 CFR 1.495):

- Indication of Small Entity Status
- Priority Document
- Copy of the International Application filed on 03/01/2007
- Copy of the International Search Report filed on 03/01/2007
- Copy of IPE Report filed on 03/01/2007
- Copy of Annexes to the IPER filed on 03/01/2007
- Preliminary Amendments filed on 03/01/2007
- Information Disclosure Statements filed on 03/01/2007
- Small Entity Statement filed on 03/01/2007
- Request for Immediate Examination filed on 03/01/2007
- U.S. Basic National Fees filed on 03/01/2007
- Priority Documents filed on 03/01/2007

The applicant needs to satisfy supplemental fees problems indicated below.

The following items **MUST** be furnished within the period set forth below in order to complete the requirements for acceptance under 35 U.S.C. 371:

- Additional claim fees of $**105** as a small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- Oath or declaration of the inventors, in compliance with 37 CFR 1.497(a) and (b), identifying the application by the International application number and international filing date.
- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.492(h) of $65 for a small entity in compliance with 37 CFR 1.27, must be submitted with the missing items identified in this letter.

SUMMARY OF FEES DUE:

Total additional fees required for this application is $**170** for a Small Entity:
- $**65** Surcharge.

Additionally the following defects have been observed:

FORM PCT/DO/EO/905 (371 Formalities Notice)

Page 220 of 448 (IPR2023-01374)
Google LLC et al v. Nariste Networks Pty. Ltd.

- Preliminary Amendments have not been entered because There are canceling claims 37-40, The original claims are 1-36.

Total additional claim fee(s) for this application is $**105**
- $**105** for **3** independent claims over 3.

ALL OF THE ITEMS SET FORTH ABOVE MUST BE SUBMITTED WITHIN TWO (2) MONTHS FROM THE DATE OF THIS NOTICE OR BY 32 MONTHS FROM THE PRIORITY DATE FOR THE APPLICATION, WHICHEVER IS LATER. FAILURE TO PROPERLY RESPOND WILL RESULT IN ABANDONMENT.

The time period set above may be extended by filing a petition and fee for extension of time under the provisions of 37 CFR 1.136(a).

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.
https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

SHELBY J VIGIL

Telephone: (703) 308-9140 EXT 224

FORM PCT/DO/EO/905 (371 Formalities Notice)

OIPE IAP6 JAN 24 2008 PATENT & TRADEMARK OFFICE

Practitioner's Docket No. U 016731-5 *PATENT*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent application
of _____
Inventor(s)

for _____
Title of invention

OR

In re application of: Robert Anderson **MALANEY**
Serial No.: 11/661,707 Group No.: - -
Filed: March 1, 2007 Examiner: - -
For: SELF MONITORING GPS ON MOBILE DEVICE

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

TRANSMITTAL OF INFORMATION DISCLOSURE STATEMENT WITHIN THREE MONTHS OF FILING OR BEFORE MAILING OF FIRST OFFICE ACTION (37 C.F.R. 1.97(b))

CERTIFICATION UNDER 37 C.F.R. 1.8(a) and 1.10*
*(When using Express Mail, the Express Mail label number is **mandatory**; Express Mail certification is optional.)*

I hereby certify that, on the date shown below, this correspondence is being:

MAILING

☒ deposited with the United States Postal Service in an envelope addressed to the Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.

37 C.F.R. 1.8(a) - **37 C.F.R. 1.10***

☒ with sufficient postage as first class mail.

☐ as "Express Mail Post Office to Addressee" Mailing Label No. _____ (**mandatory**)

TRANSMISSION

☐ transmitted by facsimile to the Patent and Trademark Office. to **(571)-273-8300**

Date: January 22, 2008

Signature
WILLIAM R. EVANS
(*type or print name of person certifying*)

* *Only the date of filing (§ 1.6) will be the date used in a patent term adjustment calculation, although the date on any certificate of mailing or transmission under § 1.8 continues to be taken into account in determining timeliness. See § 1.703(f). Consider "Express Mail Post Office to Addressee" (§ 1.10) or facsimile transmission (§ 1.6(d) for the reply to be accorded the earliest possible filing date for patent term adjustment calculations.*

NOTE: 37 C.F.R. 1.98(b):

(1) *Each U.S. patent listed in an information disclosure statement must be identified by inventor, patent number, and issue date.*

(2) *Each U.S. patent application published listed in an information disclosure statement shall be identified by applicant, patent application publication number, and publication date.*

(3) *Each U.S. application listed in an information disclosure statement must be identified by the inventor, application number, and filing date.*

(4) *Each foreign patent or published foreign patent application listed in an information disclosure statement must be identified by the country or patent office which issued the patent or published the application, an appropriate document number, and the publication date indicated on the patent or published application.*

(5) *Each publication listed in an information disclosure statement must be identified by publisher, author (fi any), title, relevant pages of the publication,,date, and place of publication.*

WARNING: *No extension of time can be had under 37 C.F.R. § 1.36 (a) or (b) for filing an IDS. 37 C.F.R. § 1.97(f).*

NOTE: The "filing date of a national application" under 37 C.F.R. 1.97(b) has two possible meanings. Where the filing is a direct one to the United States Patent & Trademark office, the filing is defined in 37 C.F.R. 1.53(b) as "the date on which: (1) A specification containing a description pursuant to § 1.71 and at least one claim pursuant to § 1.75; and (2) any drawing required by § 1.81(a), are filed in the Patent and Trademark Office in the name of the actual inventor or inventors as required by § 1.41." 37 C.F.R. 1.97(b)(1). On the other hand, an international application that enters the national stage occurs when the applicant has filed the documents and fees required by 35 U.S.C. § 371(c) within the periods set forth in § 1.494 or § 1.495. 35 U.S.C. § 371(c) requires the filing of the following: (1) the national fee; (2) a copy of the international application, unless already sent by the International Bureau, and an English translation if filed in another language; (3) amendments under PCT Article 19, with a translation into English if made in another language; (4) an oath or declaration; and (5) a translation into English of any annexes to the international preliminary examination report, if such annexes were made in another language. 37 C.F.R. 1.97(b)(2).

IDENTIFICATION OF TIME OF FILING THE ACCOMPANYING INFORMATION DISCLOSURE STATEMENT

The information disclosure statement submitted herewith is being filed within three months of the filing date of the application or date of entry into the national stage of an international application or before the mailing date of a first Office action on the merits, whichever event occurs last. 37 C.F.R. 1.97(b).

NOTE: "No certification or fee is due when the filing is made within the above time period. It is advisable to ensure that no Office action has been mailed if the disclosure statement is delayed until after three months from filing."

NOTE: "An information disclosure statement will be considered to have been filed on the day it was received in the Office, or on an earlier date of a mailing if accompanied by a properly executed certificate of mailing under 37 C.F.R. 1.8, or Express Mail certificate under 37 C.F.R. 1.10. An office action is mailed on the date indicated in the Office action." Notice of April 20, 1992 (1138 O.G. 37-41, 39).

NOTE: "The term 'national application' includes continuing applications (continuations, divisions, continuations-in-part) so three-months will be measured from the actual filing date of an application as opposed [sic] to the effective date of a continuing application." Notice of April 20, 1992 (1138 O.G. 37-41, 39).

NOTE: *"An action on the merits means an action which treats the patentability of the claims in an application, as opposed to only formal or procedural requirements. An action on the merits would, for example, contain a rejection or indication of allowability of a claim or claims rather than just a restriction requirements (37 C.F.R. 1.142) or just a requirement for additional fees to have a claim considered (37 C.F.R. 1.16(d)). Thus, if an application was filed on Jan. 1 and the first Office action on the merits was not mailed until six months later on July 1, the examiner would be required to consider any proper information disclosure statement filed prior to July 1." Notice of April 20, 1992 (1138 O.G. 37-41, 39).*

WARNING: *"A petition for suspension of action to allow applicant time to submit an information disclosure statement will be denied as failing to present good and sufficient reasons, since 37 C.F.R. 1.97 provides adequate recourse for the timely submission of prior art for consideration by the examiner." Notice of July 6, 1992 (1141 O.G. 63). But see § 103(b) and (c), limited suspension of action in a continued prosecution application (CPA) filed under § 1.53(d) and in a request for continued examination (RCE) under § 1.114.*

If a fee is required, please charge deposit account 12-0425.

Reg. No.: 25,858

Tel. No.: (212)708-1930

Customer No.: 00140

SIGNATURE OF PRACTITIONER

WILLIAM R. EVANS

(type or print name of practitioner)

P.O. Address

c/o Ladas & Parry LLP
26 West 61st Street
New York, N.Y. 10023

Page 224 of 448 (IPR2023-01374)
Google LLC et al v. Nariste Networks Pty. Ltd.

OIPE IAP6 JAN 24 2008 PATENT & TRADEMARK OFFICE

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Robert Anderson **MALANEY**

Serial No.: 11/661,707 Group No. - -

Filed: March 1, 2007 Examiner: - -

For: SELF MONITORING GPS ON MOBILE DEVICE

Attorney Docket No.: U 016731-5

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

INFORMATION DISCLOSURE STATEMENT

We draw the attention of the Examiner to the attached references (first page only for U.S. patent publications) which are also listed on the attached Form PTO-1449.

Respectfully submitted,

WILLIAM R. EVANS
C/O LADAS AND PARRY LLP
26 WEST 61ST STREET
NEW YORK, NY 10023
REG. NO. 25,858; (212) 708-1930

CERTIFICATION UNDER 37 C.F.R. 1.8(a) and 1.10*
*(When using Express Mail, the Express Mail label number is **mandatory**; Express Mail certification is optional.)*

I hereby certify that, on the date shown below, this correspondence is being:

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☒ deposited with the United States Postal Service in an envelope addressed to the Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.

37 C.F.R. 1.8(a)

☒ with sufficient postage as first class mail.

37 C.F.R. 1.10*

☐ as "Express Mail Post Office to Addressee" Mailing Label No. _____ (**mandatory**)

TRANSMISSION

☐ transmitted by facsimile to the Patent and Trademark Office. to **(571)-273-8300**

Date: January 22, 2008

Signature
WILLIAM R. EVANS
(type or print name of person certifying)

***WARNING:** *Each paper or fee filed by "Express Mail" **must** have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. 1.10(b).*
*"Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will **not** be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.*

FORM PTO-1449 U. S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTY. DOCKET NO.	SERIAL NO.
	U 016731-5	11/661,707
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	APPLICANT	
	Robert Anderson MALANEY	
(Use several sheets if necessary)	FILING DATE	GROUP
	March 1, 2007	

OIPE IAP6 JAN 24 2008 PATENT & TRADEMARK OFFICE

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	REFERENCE DESIGNATION	DOCUMENT NUMBER	DATE	NAME	FILING DATE IF APPROPRIATE
	AA				
	AB				

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION	
					YES	NO
	AC					
	AD					

OTHER ART (Including Author, Title, Date, Pertinent Dates, Etc.)

	AE	Haykin, S. "Neural Networks: A Comprehensive Foundation - 2nd Edition", Prentice Hall, Upper Saddle River, New Jersey, pp. 641-645
	AF	Conner, S., et al. "Building a Wireless World with Mesh Networking Technology" in: *Technology @ Intel*, (November 2003), pp. 1-6
	AG	Ahmavaara, K., et al. "Integration of Wireless LAN and 3G Wireless: Interworking Architecture Between 3GPP and WLAN Systems" in: *IEEE Communication Magazine*, (November 2003), pp. 74-81
	AH	Karygiannis, T., et al. "Wireless Network Security: 802.11, Bluetooth and Handheld Devices" in: *National Institiute of Standards and Technology, Technology Administration U.S. Department of Commerce*, (November 2002), pp. ES-1 - G-3
	AI	Koshima, H., et al. "Finding A Mentally Impaired Relative, A Lost Child, or a Criminal in a Sprawling Metropolitan Area would be Simple if the Person Were Equipped With A Personal Locator Device: Personal Locator Services Emerge" in: *IEEE Spectrum*, (February 2000), pp. 41-48
	AJ	OET Bulletin No. 17 "Guidelines for Testing and Verifying the Accuracy of Wireless E911 Location Systems" Federal Communications Commission USA, (April 2000), pp. 1-12
	AK	Bahl, P., et al. "RADAR: An In-Building RF-based User Location and Tracking System" *Microsoft Research*
	AL	Ladd, A., et al. "Robotics-Based Location Sensing Using Wireless Ethernet" *MOBICOM '02*, (September 2002), Atlanta Georgia, USA
	AM	Patwari, N., et al. "Relative Location Estimation in Wireless Sensor Networks" *IEEE Transactions on Signal Processing*, Vol. 15, (2003), pp. 2137-2148
	AN	Capkun, S., et al. "GPS-free Positioning in Mobile Ad-Hoc Networks" *IEEE*, Proceedings of the 34th Hawaii International Conference on Systems Sciences, (2001), pp. 1-10

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if citation 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.

FORM PTO-1449 U. S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)	ATTY. DOCKET NO.	SERIAL NO.
	U 016731-5	11/661,707
	APPLICANT	
	Robert Anderson MALANEY	
	FILING DATE	GROUP
	March 1, 2007	

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	REFERENCE DESIGNATION	DOCUMENT NUMBER	DATE	NAME	FILING DATE IF APPROPRIATE
	AA				
	AB				

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION	
					YES	NO
	AC					
	AD					

OTHER ART (Including Author, Title, Date, Pertinent Dates, Etc.)

	AE	Krumm, J., et al., "Probabilistic Inferencing for Location" *2003 Workshop on Location-Aware Computing (Part of UbiComp 2003)*, Seattle, WA, USA, (2003)
	AF	"Newbury Networks Debuts First Location-Enabled Networks Solution for 802.11B WLANS", Release Detail Newbury Networks [online], [retrieved on 11/02/2007]. Retrieved from the internet ,<URL: http://www.newburynetworks.com/pr_021102/news_events-news_archive-release_details....>
	AG	Denning, D., et al. "Location-based Authentication: Grounding Cyberspace for Better Security" Computer Fraud & Security [online], [retrieved on 11/01/2007]. Retrieved from the internet, URL: http://www.cs.georgetown.edu/~denning/infosec/Grounding.txt>
	AH	Denning, D., et al. "Using GPS to Enhance Data Security" GPS World - Geo-Encryption (April 2003) [online], [retrieved on 11/01/2007]. Retrieved from the internet, <URL: http://www.gpsworld.com/gpsworld/content/printContentPopup.jsp?id=57975>
	AI	Epstein, K., "How Geo-Encryption Makes Copyright Protection Global" CIOINSIGHT - Global Encryption by Satellite [online], [retrieved on 11/01/2007] Retrieved from the internet, <URL: http://www.coinsight.com/print_article2/0,1217,a=24831,00.asp>
	AJ	van Diggelen, F., et al. "Indoor GPS Technology" Presented at CTIA Wireless-Agenda, Dallas (May 2001), pp. 1-10
	AK	Rappaport, T., "Principles and Practice" in: *Wireless Communications*, Prentice Hall Communications Engineering and Emerging Technology Series, pp. 123-133
	AL	Battiti, R., et al. "Statistical Learning Theory for Location Fingerprinting in Wireless LANs" Technical Report DIT-02-0086, Universita di Trento (October 2002), pp. 1-12
	AM	Royer, E., et al. "A Review of Current Routing Protocols for Ad Hoc Mobile Wireless Networks' in *IEEE Personal Communications* (April 1999), pp. 46-55

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if citation 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.

Form PTO-1449 6-4

FORM PTO-1449 U. S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTY. DOCKET NO.	SERIAL NO.
	U 016731-5	**11/661,707**
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	APPLICANT	
	Robert Anderson MALANEY	
(Use several sheets if necessary)	FILING DATE	GROUP
	March 1, 2007	

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	REFERENCE DESIGNATION	DOCUMENT NUMBER	DATE	NAME	FILING DATE IF APPROPRIATE
	AA				
	AB				

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION	
					YES	NO
	AC					
	AD					

OTHER ART (Including Author, Title, Date, Pertinent Dates, Etc.)

	AE	Ziv, J., et al. "Some Lower Bounds on Signal Parameter Estimation" in: *IEEE Transactions on Information Theory*, Vol. 15, (May 1969), pp. 386-391
	AF	"SnapTrack's Wireless Assisted GPS (A-GPS) Solution Provides the Industry's Best Location System" SnapTrack, A QUALCOMM Company, White Paper, pp. 1-3
	AG	Caffery, J., et al. "Wireless Location in CDMA Cellular Radio Systems" *Kluwer Academic Publishers*, Boston, pp. 1-11
	AH	Caffery, J., et al. "Overview of Radiolocation in CDMA Cellular Systems" Georgia Institute of Technology School of Electrical and Computer Engineering, Atlanta, GA, pp. 1-32
	AI	
	AJ	
	AK	
	AL	
	AM	
	AN	

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if citation 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.

Form PTO-1449 6-4

IAP07Rec'd PCT 11 FEB 2008

Practitioner's Docket No. U 016731-5

FEB 11 2008 IAP17 PATENT & TRADEMARK OFFICE

CHAPTER II

IN THE UNITED STATES ELECTED OFFICE (EO/US)

PCT/AU2005/001351	31 August 2005	2 September 2004
INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED

SELF MONITORING GPS ON MOBILE DEVICE
TITLE OF INVENTION

Robert Anderson MALANEY
APPLICANT(S)

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

ATTENTION: EO/US

COMPLETION OF FILING REQUIREMENTS
FOR INTERNATIONAL APPLICATION ENTERING U.S. NATIONAL STAGE
IN U.S. ELECTED OFFICE (EO/US) UNDER 35 U.S.C. § 371

(check and complete the applicable item, if applicable)

☒ This replies to the Notification of Missing Requirements under 35 U.S.C. § 371 and 37 C.F.R. § 1.495 (FORM PCT/DO/EO/905).

☒ A copy of FORM PCT/DO/EO/905 accompanies this response.

CERTIFICATION UNDER 37 C.F.R. 1.10*
*(Express Mail label number is **mandatory**.)*
(Express Mail certification is optional.)

I hereby certify that this Completion of Filing Requirements and the papers indicated as being transmitted therewith are being deposited with the United States Postal Service on this date February 7, 2008, in an envelope as "Express Mail Post Office to Addressee," Mailing Label Number EV927572386US, addressed to the: Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.

Geraldine Marti
(type or print name of person mailing paper)

Signature of person mailing paper

WARNING: *Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R. 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.*

***WARNING:** *Each paper or fee filed by "Express Mail" **must** have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. 1.10(b).*
*"Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will **not** be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.*

WARNING: *Where the items being submitted to complete the entry of the international application into the national phase are subsequent to 30 months from the priority date the application is still considered to be in the international state and if mailing procedures are utilized to obtain a date the express mail procedure of 37 C.F.R. § 1.10 must be used (because international application papers are not covered by an ordinary certificate of mailing. 37 C.F.R. § 108(2)(xi).*

NOTE: *Documents and fees must be clearly identified as a submission to enter the national stage under 35 U.S.C. § 371. Otherwise, the submission will be considered as being made under 35 U.S.C. § 111. 37 C.F.R. § 1.495(g).*

DECLARATION OR OATH

NOTE: *37 C.F.R. § 1.495(c): "If applicant complies with paragraph (b) of this section before expiration of thirty months from the priority date but omits . . . the oath or declaration of the inventor (35 U.S.C. 371(c)(4) and § 1.497), if a declaration of inventorship in compliance with § 1.497 has not been previously submitted in the international application under PCT Rule 4.17 (iv) within the time limits provided for in PCT Rule 26ter.1, applicant will be so notified and given a period of time within which to file the . . . oath or declaration in order to prevent abandonment of the application . . . . The payment of the surcharge set forth in § 1.492(e) is required for acceptance of the oath or declaration of the inventor later than the expiration of* ***thirty*** *months after the priority date."*

I. (a) ☒ No original declaration or oath was filed. Enclosed is the original declaration or oath for this application.

OR

(b) ☐ The declaration or oath that was filed was determined to be defective. A new original oath or declaration is attached.

NOTE: *For surcharge fee for filing declaration after filing date complete item IV(3)*

NOTE: *NOTE: Acceptable minimums in the declaration in an ordinarily filed U.S. application for identification of the specification to which it applies are:*

(A) application number (consisting of the series code and the serial number, e.g., 08/123,456);
(B) serial number and filing date;
(C) attorney docket number which was on the specification as filed;
(D) title which was on the specification as filed and reference to an attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration; or
(E) title which was on the specification as filed and accompanied by a cover letter accurately identifying the application for which it was intended by either the application number (consisting of the series code and the serial number, e.g., 08/123,456), or serial number and filing date. Absent any statement(s) to the contrary, it will be presumed that the application filed in the PTO is the application which the inventor(s) executed by signing the oath or declaration.

M.P.E.P. § 602, 8th ed.

NOTE: *Another minimum found acceptable in the declaration is the filing date (i.e., date of express mail) and the express mail number, useful where the serial number is not yet known. But note the practice where the express mail deposit is a Saturday, Sunday or holiday within the District of Columbia. 37 C.F.R. § 1.10(c).*

NOTE: *See 37 C.F.R. § 1.41(a).*

(complete as applicable)

Attached is a

(a) ☐ Statement by practitioner that papers attached to declaration are a copy of those filed in PTO to get a filing date

(b) ☐ Statement that substitute specification contains no new matter.

(c) ☒ Preliminary Amendment of May 7, 2007

(d) ☐ Submission of "Sequence Listing," computer readable copy, and/or amendment pertaining thereto for biotechnology invention containing nucleotide and/or amino acid sequence

TRANSMITTAL OF ENGLISH TRANSLATION OF NON-ENGLISH LANGUAGE PAPERS

II. ☐ Submitted herewith is an English translation of the non-English language international application papers as originally filed. It is requested that this translation be used as the copy for examination purposes in the PTO. (See 37 C.F.R. 1.495(c))

NOTE: *For fee for processing a non-English application, complete item IV(4).*

NOTE: *A non-English oath or declaration in the form provided or approved by the PTO need not be translated. 37 C.F.R. § 1.69(b).*

FEES

III.

NOTE: See 37 C.F.R. § 1.28(a).

1. Fees for search, exam or claims

☐ Non-U.S. Search Report filed —$410.00; small entity—$205.00 $_____

☐ No Search Report —$510.00; small entity —$255.00 $_____

☐ Exam Fee not paid to U. S—$210.00; small entity—$105.00 $_____

☐ Search and Exam fee with U.S. WO or IPER conditions not satisfied—$100.00; small entity—$50.00 $_____

☐ Search and Exam fee with U.S. WO or IPER conditions satisfied—$0.00 $_____

☐ Spec and drawing, each 50 pages over 100
37 C.F.R. 1.16(s)—$250.00 $_____

☐ Each independent claim in excess of 3
(37 C.F.R. § 1.492—$210.00; small entity—$105.00 $_____

☐ each claim in excess of 20
(37 C.F.R. § 1.492—$50.00; small entity—$25.00 $_____

☐ multiple dependent claims(s)
(37 C.F.R. § 1.492—$370.00; small entity—$185.00 $_____

2. Surcharge fees

☒ surcharge set forth in 37 C.F.R. § 1.492(e) for accepting the declaration later than 30 months after the priority date in filing an application in the U.S. as a designated office—$130.00; small entity—$65.00 $ 65.00

NOTE: The processing fee in the next item 3 below is not subject to a reduction for small entity status.

3. ☐ processing fee set forth in 37 C.F.R. § 1.492(f) for acceptance of an English translation later than 30 months after the priority date—$130.00 $_____

Total Fees **$ 65.00**

—

SMALL ENTITY STATUS

IV. a. ☐ A Statement or Written Assertion that this filing is by a small entity

NOTE: See 37 C.F.R. § 1.28(a).

(check and complete applicable items)

☐ is attached.
☐ was filed on _____.
☐ was made by paying the basic national fee as a small entity.

b. ☐ A separate refund request accompanies this paper.

02/14/2008 GFREY1 00000023 11661707
01 FC:2617 65.00 OP

EXTENSION OF TIME

(complete (a) or (b), as applicable)

V.

The proceedings herein are for a patent application. Accordingly, the provisions of 37 C.F.R. § 1.136(a) apply.

(a) ☐ Applicant petitions for an extension of time, the fees for which are set out in 37 C.F.R. § 1.17(a)(1)-(4), for the total number of months checked out below:

	Extension (months)	Fee for other than small entity	Fee for small entity
☐	one month	$ 120.00	$ 60.00
☐	two months	$ 460.00	$ 230.00
☐	three months	$ 1,050.00	$ 525.00
☐	four months	$ 1,630.00	$ 815.00

NOTE: *The 2-month time period for reply to A Notice to File Missing Parts of an Application is not identified on the Notice as a statutory period subject to 35 U.S.C. 133. Thus, extensions of time of up to 5 months under 37 CFR 1.136(a), followed by additional time under 37 CFR 1.136(b), when appropriate, are permitted. MPEP 710.02(d)(c), 8th ed.*

☐	five months	$ 2,220.00	$ 1,110.00

Fee $ _____

If an additional extension of time is required, please consider this a petition therefor.

(check and complete the next item, if applicable)

☐ An extension for _____ months has already been secured. The fee paid therefor of $ _____ is deducted from the total fee due for the total months of extension now requested.

Extension fee due with this request $ _____

or

(b) ☒ Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

TOTAL FEE DUE

VI.

The total fee due is:

Completion fee(s) $ 65.00

Extension fee (if any) $ _____

TOTAL FEE DUE $ 65.00

PAYMENT OF FEES

VII.

☒ Enclosed is a check in the amount of $ 65.00

☐ Charge Account No. 12-0425 in the amount of $ _____

☐ A duplicate of this request is attached.

NOTE: Fees should be itemized in such a manner that it is clear for which purpose the fees are paid. 37 C.F.R. § 1.22(b).

AUTHORIZATION TO CHARGE ADDITIONAL FEES

VIII.

WARNING: *Accurately count claims, especially multiple dependent claims, to avoid unexpected high charges if extra claims are authorized.*

NOTE: *"A written request may be submitted in an application that is an authorization to treat any concurrent or future reply, requiring a petition for an extension of time under this paragraph for its timely submission, as incorporating a petition for extension of time for the appropriate length of time. An authorization to charge all required fees, fees under § 1.17, or all required extension of time fees will be treated as a constructive petition for an extension of time in any concurrent or future reply requiring a petition for an extension of time under this paragraph for its timely submission. Submission of the fee set forth in § 1.17(a) will also be treated as a constructive petition for an extension of time in any concurrent reply requiring a petition for an extension of time under this paragraph for its timely submission." 37 C.F.R. § 1.136(a)(3).*

NOTE: *"Amounts of twenty-five dollars or less will not be returned unless specifically requested within a reasonable time, nor will the payer be notified of such amounts; amounts over twenty-five dollars may be returned by check or, if requested, by credit to a deposit account." 37 C.F.R. § 1.26(a).*

☒ The Commissioner is hereby authorized to charge the following additional fees that may be required by this paper and during the entire pendency of this application to Account No. 12-0425

☒ 37 C.F.R. § 1.492(a), (b) or (c) (search or exam fee)

☐ 37 C.F.R. § 1.492(b), (c), and (d) (presentation of extra claims)

NOTE: *Because additional fees for excess or multiple dependent claims not paid on filing or on later presentation must only be paid or these claims cancelled by amendment prior to the expiration of the time period set for response by the PTO in any notice of fee deficiency (37 C.F.R. § 1.16(d)), it might be best not to authorize the PTO to charge additional claim fees, except possibly when dealing with amendments after final action.*

☒ 37 C.F.R. 1.16(s) (spec and drawing, each 50 pages over 100)

☒ 37 C.F.R. § 1.17 (application processing fees)

☒ 37 C.F.R. § 1.17(a)(1)-(5) (extension fees pursuant to § 1.136(a)).

NOTE: *Section 1.311(b) provides that an authorization to charge the issue fee (§ 1.18) to a deposit account may be filed in an individual application* ***only after the mailing of the notice of allowance****. Accordingly, general authorizations to any fees and specific authorizations to pay the issue fee that are filed prior to the mailing of a notice of allowance will generally not be treated as requesting payment of the issue fee and will not be given effect to act as a reply to the notice of allowance. Applicant, when paying the issue fee, should submit a new authorization to charge fees, such as by completing box 6b on the current PTOL 85-B form. Where no reply to the notice of allowance is received, the application will stand abandoned notwithstanding the presence of general authorizations to pay fees or a specific authorization to pay the issue fee that were submitted prior to mailing of the notice of allowance. Where an attempt is made to pay the issue fee but an incorrect amount is submitted, § 1,311(b)(1), or where the Office's issue fee transmittal form (currently PTOL-85(B)) is completed by applicant ans submitted, § 1.311 (b)(2), in reply to a notice of allowance, an exception will be made. Such submissions will operate as a request to charge the issue fee to any deposit account identified in a previously filed (i.e., submitted prior to the mailing of the notice of allowance) authorization to charge fees, and will be allowed to act as payment of the correct issue fee. § 1.311(b). See also the change to § 1.26(b), Notice of September 8, 2000, Fed. Reg. 54603-54683, at 54646 and 54647.*

☒ 37 C.F.R. § 1.492(e) and/or (f) surcharge fees for filing the declaration and/or an English translation of an international application later than 30 months from the earliest-claimed priority date.

WARNING: *It would be wise to always check this last authorization.*

Refund any overpayment to deposit account 12-0425.

Reg. No.:

Tel. No.: ( )

W R Evans by PdW Pl
Reg # 27885

SIGNATURE OF PRACTITIONER

William R. Evans, 25858, (212) 708-1930

(type or print name of practitioner)

P.O. Address

c/o Ladas & Parry LLP
26 West 61st Street
New York, N.Y. 10023

Customer No.:

00140

PATENT TRADEMARK OFFICE

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

U.S. APPLICATION NUMBER NO.	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
11/661,707	Robert Anderson Malaney	U 016731-5

140
LADAS & PARRY
26 WEST 61ST STREET
NEW YORK, NY 10023

RECEIVED
JAN 28 2008
L & P LLP

INTERNATIONAL APPLICATION NO.	
PCT/AU05/01351	
I.A. FILING DATE	PRIORITY DATE
08/31/2005	09/02/2004

CONFIRMATION NO. 9076
371 FORMALITIES LETTER



Date Mailed: 01/24/2008

NOTIFICATION OF MISSING REQUIREMENTS UNDER 35 U.S.C. 371 IN THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US)

The following items have been submitted by the applicant or the IB to the United States Patent and Trademark Office as an Elected Office (37 CFR 1.495):

- Indication of Small Entity Status
- Priority Document
- Copy of the International Application filed on 03/01/2007
- Copy of the International Search Report filed on 03/01/2007
- Copy of IPE Report filed on 03/01/2007
- Copy of Annexes to the IPER filed on 03/01/2007
- Preliminary Amendments filed on 03/01/2007
- Information Disclosure Statements filed on 03/01/2007
- Small Entity Statement filed on 03/01/2007
- Request for Immediate Examination filed on 03/01/2007
- U.S. Basic National Fees filed on 03/01/2007
- Priority Documents filed on 03/01/2007

The applicant needs to satisfy supplemental fees problems indicated below.

The following items **MUST** be furnished within the period set forth below in order to complete the requirements for acceptance under 35 U.S.C. 371:

- Additional claim fees of **$105** as a small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- Oath or declaration of the inventors, in compliance with 37 CFR 1.497(a) and (b), identifying the application by the International application number and international filing date.
- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.492(h) of $65 for a small entity in compliance with 37 CFR 1.27, must be submitted with the missing items identified in this letter.

SUMMARY OF FEES DUE:

Total additional fees required for this application is **$170** for a Small Entity:
- **$65** Surcharge.

Additionally the following defects have been observed:

FORM PCT/DO/EO/905 (371 Formalities Notice)

- Preliminary Amendments have not been entered because There are canceling claims 37-40, The original claims are 1-36.

Total additional claim fee(s) for this application is **$105**
- **$105** for **3** independent claims over 3.

ALL OF THE ITEMS SET FORTH ABOVE MUST BE SUBMITTED WITHIN TWO (2) MONTHS FROM THE DATE OF THIS NOTICE OR BY 32 MONTHS FROM THE PRIORITY DATE FOR THE APPLICATION, WHICHEVER IS LATER. FAILURE TO PROPERLY RESPOND WILL RESULT IN ABANDONMENT.

The time period set above may be extended by filing a petition and fee for extension of time under the provisions of 37 CFR 1.136(a).

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.
https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

SHELBY J VIGIL

Telephone: (703) 308-9140 EXT 224

FORM PCT/DO/EO/905 (371 Formalities Notice)

Practitioner's Docket No. U 016731-5 *PATENT*

Optional Customer No. Bar Code



00140

PATENT TRADEMARK OFFICE

COMBINED DECLARATION AND POWER OF ATTORNEY

(ORIGINAL, DESIGN, NATIONAL STAGE OF PCT, SUPPLEMENTAL, DIVISIONAL, CONTINUATION, OR C-I-P)

As a below named inventor, I hereby declare that:

TYPE OF DECLARATION

This declaration is of the following type:

(check one applicable item below)

[ ] original.
[ ] design.

NOTE: With the exception of a supplemental oath or declaration submitted in a reissue, a supplemental oath or declaration is not treated as an amendment under 37 CFR 1.312 (Amendments after allowance). M.P.E.P. Section 714.16, 7th Ed.

[ ] supplemental.

NOTE: If the declaration is for an International Application being filed as a divisional, continuation or continuation-in-part application, do not check next item; check appropriate one of last three items.

[x] national stage of PCT.

NOTE: If one of the following 3 items apply, then complete and also attach ADDED PAGES FOR DIVISIONAL, CONTINUATION OR C-I-P.

NOTE: See 37 C.F.R. Section 1.63(d) (continued prosecution application) for use of a prior nonprovisional application declaration in the continuation or divisional application being filed on behalf of the same or fewer of the inventors named in the prior application.

[ ] divisional.
[ ] continuation.

NOTE: Where an application discloses and claims subject matter not disclosed in the prior application, or a continuation or divisional application names an inventor not named in the prior application, a continuation-in-part application must be filed under 37 C.F.R. Section 1.53(b) (application filing requirements-nonprovisional application).

[ ] continuation-in-part (C-I-P).

Page 238 of 448 (IPR2023-01374)
Google LLC et al v. Nariste Networks Pty. Ltd.

INVENTORSHIP IDENTIFICATION

WARNING: *If the inventors are each not the inventors of all the claims, an explanation of the facts, including the ownership of all the claims at the time the last claimed invention was made, should be submitted.*

My residence, post office address and citizenship are as stated below, next to my name. I believe that I am the original, first and sole inventor *(if only one name is listed below)* or an original, first and joint inventor *(if plural names are listed below)* of the subject matter that is claimed, and for which a patent is sought on the invention entitled:

TITLE OF INVENTION

SELF MONITORING GPS ON MOBILE DEVICE

SPECIFICATION IDENTIFICATION

the specification of which:

(complete (a), (b), or (c))

(a) [ ] is attached hereto.

NOTE: *"The following combinations of information supplied in an oath or declaration filed on the application filing date with a specification are acceptable as minimums for identifying a specification and compliance with any one of the items below will be accepted as complying with the identification requirement of 37 C.F.R. Section 1.63:*

"(1) name of inventor(s), and reference to an attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration on filing;

"(2) name of inventor(s), and attorney docket number which was on the specification as filed; or

"(3) name of inventor(s), and title which was on the specification as filed."

Notice of July 13, 1995 (1177 O.G. 60).

(b) [ ] was filed on _____, [ ] as Application No. _____
[ ] and was amended on _____ (if applicable).

NOTE: *Amendments filed after the original papers are deposited with the PTO that contain new matter are not accorded a filing date by being referred to in the declaration. Accordingly, the amendments involved are those filed with the application papers or, in the case of a supplemental declaration, are those amendments claiming matter not encompassed in the original statement of invention or claims. See 37 C.F.R. Section 1.67.*

NOTE: *"The following combinations of information supplied in an oath or declaration filed after the filing date are acceptable as minimums for identifying a specification and compliance with any one of the items below will be accepted as complying with the identification requirement of 37 C.F.R. Section 1.63:*

(A) application number (consisting of the series code and the serial number, e.g., 08/123,456);
(B) serial number and filing date;
(C) attorney docket number which was on the specification as filed;
(D) title which was on the specification as filed and reference to an attached specification which is both attached to the oath or declaration at the time of execution and submitted with the oath or declaration; or
(E) title which was on the specification as filed and accompanied by a cover letter accurately identifying the application for which it was intended by either the application number (consisting of the series code and the serial number, e.g., 08/123,456), or serial number and filing date. Absent any statement(s) to the contrary, it will be presumed that the application filed in the PTO is the application which the inventor(s) executed by signing the oath or declaration.
M.P.E.P. § 602, 8th ed.

(c) [x] was described and claimed in PCT International Application No. AU2005/001351 filed on 31 AUGUST 2005 and as amended under PCT Article 19 on _____ *(if any)*.

SUPPLEMENTAL DECLARATION (37 C.F.R. Section 1.67(b))

(complete the following where a supplemental declaration is being submitted)

[ ] I hereby declare that the subject matter of the

[ ] attached amendment
[ ] amendment filed on _____.

was part of my/our invention and was invented before the filing date of the original application, above identified, for such invention.

ACKNOWLEDGMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information, which is material to patentability as defined in 37, Code of Federal Regulations, Section 1.56,

(also check the following items, if desired)

[x] and which is material to the examination of this application, namely, information where there is a substantial likelihood that a reasonable Examiner would consider it important in deciding whether to allow the application to issue as a patent, and

[ ] in compliance with this duty, there is attached an information disclosure statement, in accordance with 37 C.F.R. Section 1.98.

PRIORITY CLAIM (35 U.S.C. Section 119(a)-(d))

NOTE: 37 C.F.R. § 1.55 Claim for foreign priority.

"(a) An applicant in a nonprovisonal application may claim the benefit of the filing date of one or more prior foreign applications under the conditions specified in 35 U.S.C. 119(a) through (d) and (f), 172, and 365(a) and (b).

(1)(i) In an original application filed under 35 U.S.C. 111(a), the claim for priority must be presented during the pendency of the application,, and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior foreign application. This time period is not extendable. The claim must identify the foreign application for which priority is claimed, as well as any foreign application for the same subject matter and having a filing date before that of the application for which priority is claimed, by specifying the application number, country (or intellectual property authority), day, month, and year of its filing. The time period in this paragraph does not apply to an application for a design patent.

(ii) In an application that entered the national stage from an international application after compliance with 35 U.S.C. 371, the claim for priority must be made during the pendency of the application and within the time limit set forth in the PCT and the Regulations under the PCT."

Page 240 of 448 (IPR2023-01374)
Google LLC et al v. Nariste Networks Pty. Ltd.

(2) The claim for priority and the certified copy of the foreign application specified in 35 U.S.C. 119(b) or PCT Rule 17 must, in any event, be filed before the patent is granted. If the claim for priority or the certified copy of the foreign application is filed after the date the issue fee is paid, it must be accompanied by the processing fee set forth in § 1.17(i), but the patent will not include the priority claim unless corrected by a certificate of correction under 35 U.S.C. 255 and § 1.323.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

(complete (d) or (e))

(d) [ ] no such applications have been filed.
(e) [x] such applications have been filed as follows.

NOTE: Where item (c) is entered above and the International Application which designated the U.S. itself claimed priority check item (e), enter the details below and make the priority claim.

PRIOR FOREIGN/PCT APPLICATION(S) FILED WITHIN 12 MONTHS (6 MONTHS FOR DESIGN) PRIOR TO THIS APPLICATION AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. SECTION 119(a)-(d)

COUNTRY (OR INDICATE IF PCT)	APPLICATION NUMBER	DATE OF FILING DAY MONTH YEAR	PRIORITY CLAIMED UNDER 35 USC 119
Australia	2004905024	2 September 2004	[x]YES [ ]NO
			[ ]YES [ ]NO
			[ ]YES [ ]NO
			[ ]YES [ ]NO
			[ ]YES [ ]NO

CLAIM FOR BENEFIT OF PRIOR U.S. PROVISIONAL APPLICATION(S)
(35 U.S.C. Section 119(e))

NOTE: 35 U.S.C. 119(e)(1) requires that a nonprovisional application be filed within twelve months of the filing date of the provisional application for the nonprovisional application to claim the benefit of the filing date of the provisional application. Under 35 U.S.C. 21(b) and 119(e)(3), if this twelve-month period expires on a non-business day, it is extended to expire on the next business day.

I hereby claim the benefit under Title 35, United States Code, Section 119(e) of any United States provisional application(s) listed below:

PROVISIONAL APPLICATION NUMBER	FILING DATE
_____/_____	_____
_____/_____	_____
_____/_____	_____

CLAIM FOR BENEFIT OF EARLIER U.S./PCT APPLICATION(S) UNDER 35 U.S.C. SECTION 120

[ ] The claim for the benefit of any such applications are set forth in the attached ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR CONTINUATION-IN-PART (C-I-P) APPLICATION.

ALL FOREIGN APPLICATION(S), *IF ANY*, FILED MORE THAN 12 MONTHS (6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION

_____

_____

_____

NOTE: If the application filed more than 12 months from the filing date of this application is a PCT filing forming the basis for this application entering the United States as (1) the national stage, or (2) a continuation, divisional, or continuation-in-part, then also complete ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR C-I-P APPLICATION for benefit of the prior U.S. or PCT application(s) under 35 U.S.C. Section 120.

POWER OF ATTORNEY

I hereby appoint the following practitioner(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

(list name and registration number)

JOHN RICHARDS, 31053

RICHARD J. STREIT, 25765

PETER D. GALLOWAY, 27885

RICHARD P. BERG, 28145

JULIAN H. COHEN, 20302

WILLIAM R. EVANS 25858

JANET I. CORD, 33778

CLIFFORD J. MASS, 30086

(Check the following item, if applicable)

[X] I hereby appoint the practitioner(s) associated with the Customer Number provided above and below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

Customer No. 00140

[ ] Attached, as part of this declaration and power of attorney, is the authorization of the above-named practitioner(s) to accept and follow instructions from my representative(s).

NOTE: "Special care should be taken in continuation or divisional applications to ensure that any change of correspondence address in a prior application is reflected in the continuation or divisional application. For example, where a copy of the oath or declaration from the prior application is submitted for a continuation or divisional application filed under 37 CFR 1.53(b) and the copy of the oath or declaration from the prior application designates an old correspondence address, the Office may not recognize, in the continuation or divisional application, the change of correspondence address made during the prosecution of the prior application. Applicant is required to identify the change of correspondence address in the continuation or divisional application to ensure that communications from the Office are mailed to the current correspondence address. 37 CFR 1.63(d)(4)." Section 601.03, M.P.E.P., 7th Ed

---

SEND CORRESPONDENCE TO

DIRECT TELEPHONE CALLS TO:
(Name and telephone number)

Customer No.:



00140

PATENT TRADEMARK OFFICE

Ladas & Parry LLP
26 West 61st Street
New York, N.Y. 10023

(complete the following if applicable)

This is the filing of [ ] continuation [ ] divisional and there is attached hereto a Change of Correspondence Address so that there will be no question as to where the PTO should direct all correspondence.

DECLARATION

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.

SIGNATURE(S)

NOTE: Carefully indicate the family (or last) name, as it should appear on the filing receipt and all other document.

NOTE: Each inventor must be identified by full name, including the family name, and at least one given name without abbreviation together with any other given name or initial, and by his/her residence, post office address and country of citizenship. 37 C.F.R. Section 1.63(a)(3).

NOTE: Inventors may execute separate declarations/oaths provided each declaration/oath sets forth all the inventors. Section 1.63(a)(3) requires that a declaration/oath, inter alia, identify each inventor and prohibits the execution of separate declarations/oaths which each sets forth only the name of the executing inventor. 62 Fed. Reg. 53,131, 53,142, October 10, 1997.

Full name of sole or first inventor

Robert (*Given Name*) Anderson (*Middle Initial or Name*) Malaney (*Family (Or Last Name)*)

Inventor's signature (x) X [signature]

Date (x) X 15 JAN 2007 **Country of Citizenship** Australia

Residence East Lindfield, New South Wales 2070, Australia

Post Office Address 16 Carlyle Road

East Lindfield, New South Wales 2070, Australia

Full name of second joint inventor, if any

(*Given Name*) (*Middle Initial or Name*) (*Family (Or Last Name)*)

Inventor's signature _____

Date _____ **Country of Citizenship** _____

Residence _____

Post Office Address _____

_____

Full name of third joint inventor, if any

(*Given Name*) (*Middle Initial or Name*) (*Family (Or Last Name)*)

Inventor's signature _____

Date _____ **Country of Citizenship** _____

Residence _____

Post Office Address _____

_____

(check proper box(es) for any of the following added page(s) that form a part of this declaration)

[ ] **Signature** for fourth and subsequent joint inventors. Number of pages added ____

* * *

[ ] **Signature** by administrator(trix), executor(trix) or legal representative for deceased or incapacitated inventor. Number of pages added ____

* * *

[ ] **Signature** for inventor who refuses to sign or cannot be reached by person authorized under 37 C.F.R. Section 1.47. Number of pages added ____

* * *

[ ] Added page for **signature** by one joint inventor on behalf of deceased inventor(s) where legal representative cannot be appointed in time. (37 C.F.R. Section 1.47)

* * *

[ ] Added pages to combined declaration and power of attorney for divisional, continuation, or continuation-in-part (C-I-P) application.

[ ] Number of pages added ____

* * *

[ ] Authorization of practitioner(s) to accept and follow instructions from representative.

(If no further pages form a part of this Declaration, then end this Declaration with this page and check the following item)

[x] This declaration ends with this page.

Practitioner's Docket No. U 016731-5

CHAPTER II

IN THE UNITED STATES ELECTED OFFICE (EO/US)

PCT/AU2005/001351	31 August 2005	2 September 2004
INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED

SELF MONITORING GPS ON MOBILE DEVICE
TITLE OF INVENTION

Robert Anderson MALANEY
APPLICANT(S)

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

REQUEST FOR CORRECTION OF NOTIFICATION OF MISSING REQUIREMENTS

The Notification of January 24, 2008, refuses the Preliminary Amendment of May 7, 2007, of claims 1-40, because the original claims are 1-36.

CERTIFICATION UNDER 37 C.F.R. 1.10*
*(Express Mail label number is **mandatory**.)*
(Express Mail certification is optional.)

I hereby certify that this Completion of Filing Requirements and the papers indicated as being transmitted therewith are being deposited with the United States Postal Service on this date February 7, 2008, in an envelope as "Express Mail Post Office to Addressee," Mailing Label Number EV927572386US, addressed to the: Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.

Geraldine Marti
(type or print name of person mailing paper)

Signature of person mailing paper

WARNING: *Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R. 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.*

***WARNING:** *Each paper or fee filed by "Express Mail" **must** have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. 1.10(b).*
*"Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will **not** be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.*

However, the original claims were replaced by Article 19 claims 1-36 of November 14, 2005, which were replaced by Article 34 (Chapter II) claims 1-40 of 3 July 2006, as shown by the International Preliminary Report on Patentability of 18 July 2006. A copy of the International Preliminary Report on Patentability was filed in the US DO/EO March 1, 2007, and another is attached.

The International Preliminary Report on Patentability does not annex the claims 1-40. However, this is an internal error of PCT that cannot penalize the applicant.

Entry of the Preliminary Amendment of May 7, 2007 is, therefore, required.

Respectfully submitted,

William R. Evans
c/o Ladas & Parry LLP
26 West 61st Street
New York, New York 10023
Reg. No. 25858
Tel. No. (212) 708-1930

Page 247 of 448 (IPR2023-01374)
Google LLC et al v. Nariste Networks Pty. Ltd.

U 016731-5

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 672078C	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/AU2005/001351	International filing date *(day/month/year)* 31 August 2005	Priority date *(day/month/year)* 2 September 2004

International Patent Classification (IPC) or national classification and IPC

Int. Cl.

G01S 5/00 (2006.01)

Applicant

MALANEY, Robert Anderson

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☐ *(sent to the applicant and to the International Bureau)* a total of sheets, as follows:
      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or table related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
3 July 2006	18 July 2006
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer **ATA MAQBOOL** Telephone No. (02) 6283 7905

Form PCT/IPEA/409 (Cover sheet) (April 2005)

EXPRESS MAIL LABEL NO.: EV 927 568 293 US

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/AU2005/001351

Box No. I Basis of the report

1. With regard to the language, this report is based on:

[X] The international application in the language in which it was filed

[ ] A translation of the international application into , which is the language of a translation furnished for the purposes of:

[ ] international search (under Rules 12.3(a) and 23.1 (b))

[ ] publication of the international application (under Rule 12.4(a))

[ ] international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

[ ] the international application as originally filed/furnished

[X] the description:

pages **1-18** as originally filed/furnished
pages* received by this Authority on with the letter of
pages* received by this Authority on with the letter of

[X] the claims:

pages as originally filed/furnished
pages* as amended (together with any statement) under Article 19
pages* **19-25** received by this Authority on **3 July 2006** with the letter of **3 July 2006**
pages* received by this Authority on with the letter of

[X] the drawings:

pages **1/6-6/6** as originally filed/furnished
pages* received by this Authority on with the letter of
pages* received by this Authority on with the letter of

[ ] a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. [ ] The amendments have resulted in the cancellation of:

[ ] the description, pages
[ ] the claims, Nos.
[ ] the drawings, sheets/figs
[ ] the sequence listing *(specify)*:
[ ] any table(s) related to the sequence listing *(specify)*:

4. [ ] This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

[ ] the description, pages
[ ] the claims, Nos.
[ ] the drawings, sheets/figs
[ ] the sequence listing *(specify)*:
[ ] any table(s) related to the sequence listing *(specify)*:

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/AU2005/001351

Box No. V **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims 1-40	YES
	Claims	NO
Inventive step (IS)	Claims 1-40	YES
	Claims	NO
Industrial applicability (IA)	Claims 1-40	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)

NOVELTY (N) & INVENTIVE STEP (IS)

The claims are considered novel and inventive over the cited prior art documents because none of the citations either individually or in obvious combination disclose the features of amended independent claims 1, 12 and 23. Furthermore it is accepted that none of the citations specifically teach the use of a "neural network' in estimating a new value for a power-up period as recited in independent claims 34 and 35.

The remaining claims being dependent from the above independent claims consequently also satisfy the requirements of novelty and inventive step.

LADAS & PARRY LLP
INTELLECTUAL PROPERTY LAW

William R. Evans wevans@ladas.com
212.708.1930

26 West 61st Street • New York, New York 10023-7604
P 212.708.1800 • F 212.246.8959 • F 212.246.8925 • nymail@ladas.com • www.ladas.com

February 7, 2008

AIR MAIL

Spruson & Ferguson
G.P.O. Box 3898
Sydney NSW 2001, Australia

Dear Sirs:

RE: Robert Anderson MALANEY
(NARISTE NETWORKS PTY LTD.)
U. S. Patent Appln. 11/661,707
Filed: March 1, 2007
Your Ref.: 672078US:SDB
Our Ref.: U 016731-5

1. We enclose a copy of a Notification for the Declaration and the Completion that we filed in response.

2. You will see that the Notification objects to the Preliminary Amendment reported with our letter of May 7, 2007, and that we have filed a Request (copy enclosed) for correction of the Notification and acceptance on the Preliminary Amendment.

Very truly yours,

William R. Evans

WRE:os

Page 251 of 448 (IPR2023-01374)
Google LLC et al v. Nariste Networks Pty. Ltd.

DO/ EO WORKSHEET

Shelby Vigil, Patent Application Specialist/ National Stage Division

U.S. Appl. No. 11/661707 International Appl. No. PCT/AU05/1357

Application filed by : ☐ 20 months ☑ 30 months

WIPO PUBLICATION INFORMATION :

Publication No.: WO2006/ 24112 Publication Language : ☑ English ☐ German ☐ Japanese ☐ Chinese ☐ Korean ☐ French ☐ Spanish ☐ Russian ☐ Other : _____

Publication Date : 3 9 2006 Not Published : ☐ U.S. only designated ☐ EP request Published : ☐ EP request

INTERNATIONAL APPLICATION PAPERS IN THE APPLICATION FILE :

- ☑ International Application *(RECORD COPY)*
- ☐ Article 19 Amendments
- ☑ PCT/IPEA/409 IPER : ☐ EP ☐ JP ☐ SE ☑ AU ☐ US ☐ FR ☐ CN ☐ ES ☐ RU ☐ AT ☐ KR ☐ ___
- ☐ Annexes to 409
- ☐ PCT/ISA/237 : ☐ EP ☐ JP ☐ SE ☐ AU ☐ US ☐ FR ☐ CN ☐ ES ☐ RU ☐ AT ☐ KR ☐ ___
  - ☐ PCT/IPEA/409 or PCT/ISA/237 was NOT AVAILABLE at the time of paralegal review
- ☐ PCT/IB/306
- ☐ Request form PCT/RO/101
- ☑ PCT/ISA/210 - Search Report : ☐ EP ☐ JP ☐ SE ☑ AU ☐ US ☐ FR ☐ CN ☐ ES ☐ RU ☐ AT ☐ KR ☐ ___ ☐ NONE
- ☐ Search Report References
- ☑ Priority Document (s) No. 1
  - ☐ N/A
  - ☐ Priority Document was NOT AVAILABLE at the time of paralegal review
- ☑ Other : 304,306,401

RECEIPTS FROM THE APPLICANT *(other than checked above) :*

- ☑ Basic National Fee *(or authorization to charge)*
- ☑ Description ☐ Claims ☐ Abstract
- ☑ Drawing Figure(s) - (# of drwgs. 6)
- ☐ Translation of Article 19 Amendments ☐ entered ☐ not entered :
  - ☐ not a page for page substitution
  - ☐ replaced by Article 34 Amendment
- ☑ Annexes to 409 ☑ entered ☐ not entered :
  - ☐ not a page for page substitution
  - ☐ no translation ☐ other : _____
- ☐ Application Data Sheet
- ☐ Power of Attorney
- ☐ Change of Address
- ☑ Preliminary Amendment(s) Filed on : not entered 1. ☐ same as 371 request date 2. 5/7/07 3. _____
- ☑ Information Disclosure Statement(s) Filed on : 1. ☐ same as 371 request date 2. 10/9/07 3. _____
- ☐ Assignment Document (forwarded to Assignment Branch)
- ☐ Assignee Statement Under 37 CFR 3.73(b)
- ☐ Assignee PG Publication Notice
- ☐ Substitute Specification Filed on : 1. ☐ same as 371 request date 2. _____ 3. _____
- ☑ Verified Small Status Statement
- ☑ Oath/ Declaration (executed)
- ☐ Oath/ Declaration ☐ unsigned ☐ no citizenship ☐ other
- ☐ DNA Diskette ☐ Sequence Listing
- ☐ Other : _____

NOTES : ☐ I.A. used as Specification ☐ Other :

35 U.S.C. 371 - Receipt of Request (PTO-1390)	mo. 3 / day 1 / yr. 2007 EP,
Date Acceptable Oath/ Declaration Received	☐ Same as 371 Req. Date; ☐ mo. 2 / day 1 / yr. 2008
Date of Completion of requirements under 35 U.S.C. 371	☐ Same as 371 Req. Date; ☐ Same as OATH Date; ☐ mo. / day / yr. 200
Date of Completion of DO/ EO 903 - Notification of Acceptance	
Date of Completion of DO/ EO 905 - Notification of Missing Requirements	
Date of Completion of DO/ EO 909 - Notification of Abandonment	
Date of Completion of DO/ EO 916 - Notification of Defective Response	
Date of Completion of DO/ EO 922 - Notification to Comply w/ Requirements for Patent Applications Containing Nucleotide and/or Amino Acid Sequence Disclosures	
Date of Completion of DO/ EO 923	

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

U.S. APPLICATION NUMBER NO.	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
11/661,707	Robert Anderson Malaney	U 016731-5

140
LADAS & PARRY LLP
26 WEST 61ST STREET
NEW YORK, NY 10023

INTERNATIONAL APPLICATION NO.	
PCT/AU2005/001351	
I.A. FILING DATE	PRIORITY DATE
08/31/2005	09/02/2004

CONFIRMATION NO. 9076
371 ACCEPTANCE LETTER

OC00000032249918

Date Mailed: 09/29/2008

NOTICE OF ACCEPTANCE OF APPLICATION UNDER 35 U.S.C 371 AND 37 CFR 1.495

The applicant is hereby advised that the United States Patent and Trademark Office in its capacity as a Designated / Elected Office (37 CFR 1.495), has determined that the above identified international application has met the requirements of 35 U.S.C. 371, and is ACCEPTED for national patentability examination in the United States Patent and Trademark Office.

The United States Application Number assigned to the application is shown above and the relevant dates are:

02/11/2008	02/11/2008
DATE OF RECEIPT OF 35 U.S.C. 371(c)(1), (c)(2) and (c)(4) REQUIREMENTS	DATE OF COMPLETION OF ALL 35 U.S.C. 371 REQUIREMENTS

A Filing Receipt (PTO-103X) will be issued for the present application in due course. **THE DATE APPEARING ON THE FILING RECEIPT AS THE " FILING DATE" IS THE DATE ON WHICH THE LAST OF THE 35 U.S.C. 371 (c)(1), (c)(2) and (c)(4) REQUIREMENTS HAS BEEN RECEIVED IN THE OFFICE. THIS DATE IS SHOWN ABOVE.** *The filing date of the above identified application is the international filing date of the international application (Article 11(3) and 35 U.S.C. 363).* Once the Filing Receipt has been received, send all correspondence to the Group Art Unit designated thereon.

The following items have been received:

- Indication of Small Entity Status
- Copy of the International Application filed on 03/01/2007
- Copy of the International Search Report filed on 03/01/2007
- Copy of IPE Report filed on 03/01/2007
- Copy of Annexes to the IPER filed on 03/01/2007
- Preliminary Amendments filed on 02/11/2008
- Information Disclosure Statements filed on 03/01/2007
- Oath or Declaration filed on 02/11/2008
- Small Entity Statement filed on 03/01/2007
- Request for Immediate Examination filed on 03/01/2007
- U.S. Basic National Fees filed on 03/01/2007
- Priority Documents filed on 03/01/2007

FORM PCT/DO/EO/903 (371 Acceptance Notice)

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

SHELBY J MILLER

Telephone: (703) 308-9140 EXT 224

FORM PCT/DO/EO/903 (371 Acceptance Notice)

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	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
11/661,707	02/11/2008	3662	1115	U 016731-5	36	6

CONFIRMATION NO. 9076

140
LADAS & PARRY LLP
26 WEST 61ST STREET
NEW YORK, NY 10023

FILING RECEIPT

OC000000032249917

Date Mailed: 09/29/2008

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)

Robert Anderson Malaney, New South Wales, AUSTRALIA;

Power of Attorney: The patent practitioners associated with Customer Number 00140

Domestic Priority data as claimed by applicant

This application is a 371 of PCT/AU2005/001351 08/31/2005

Foreign Applications

AUSTRALIA 20049052024 09/02/2004

If Required, Foreign Filing License Granted: 09/24/2008

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 11/661,707**

Projected Publication Date: 01/08/2009

Non-Publication Request: No

Early Publication Request: No
** **SMALL ENTITY** **

Title

Self Monitoring Gps on Mobile Device

Preliminary Class

342

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as

set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/661,707	02/11/2008	Robert Anderson Malaney	U 016731-5

CONFIRMATION NO. 9076

140
LADAS & PARRY LLP
26 WEST 61ST STREET
NEW YORK, NY 10023

PUBLICATION NOTICE

OC000000033960292

Title: Self Monitoring Gps on Mobile Device

Publication No.US-2009-0009387-A1
Publication Date:01/08/2009

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

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

PLUS Search Results for S/N 11661707, Searched Thu May 06 15:31:01 EDT 2010

The Patent Linguistics Utility System (PLUS) is a USPTO automated search system for U.S. Patents from 1971 to the present PLUS is a query-by-example search system which produces a list of patents that are most closely related linguistically to the application searched. This search was prepared by the staff of the Scientific and Technical Information Center, SIRA.

5963167 99
6125326 96
4849961 93
5422814 93
5504492 93
5663735 93
5910788 93
6104978 93
6222484 93
6222484 93
H000605 90
5434787 90
5549477 90
5596500 90
5608393 90
5699244 90
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5347645 86
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/661,707	02/11/2008	Robert Anderson Malaney	U 016731-5	9076

140 7590 05/19/2010

LADAS & PARRY LLP
26 WEST 61ST STREET
NEW YORK, NY 10023

EXAMINER	
NGUYEN, NGA X	
ART UNIT	PAPER NUMBER
3662	

NOTIFICATION DATE	DELIVERY MODE
05/19/2010	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):

nyuspatactions@ladas.com

Office Action Summary	Application No.	Applicant(s)	
	11/661,707	MALANEY, ROBERT ANDERSON	
	Examiner	Art Unit	
	NGA X. NGUYEN	3662	

-- 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 _____.

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) *1-36* 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) *1-36* 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 *01 March 2007* 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 *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :01/24/2008, 10/09/2007, 03/01/2007.

Claim Rejections - 35 USC § 112

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.

1. Claim 2, 5-6, 10, 12-13, 24, 28, 32 & 34-35 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.

With regard to claim 12,

- "A processor and memory coupled to said processor" is unclear. Are there two processors in the mobile device? Or a processor and memory are connected?
- "Setting a current …, said specifications being statistical bounds" is unclear.

With regard to claim 10, 21, 32, 34-35 are unclear. What is a neural network?

With regard to claim 2, 13, 24, are unclear. What does Cramer-Rao Bound mean?

With regard to claim 5-6, 28 are unclear. What are the adaptive-filter and machine learning techniques?

2. *Claim 12, 18, 22-23, 29, 33 are rejected under 35 U.S.C. 112, 2nd paragraph, fails to clearly link or associate the disclosed structure, material, or acts to the function recited in a claim limitation invoking 35 U.S. C. 112, Sixth Paragraph*

Claim element "mean for" is a means (or step) plus function limitation that invokes 35 U.S.C. 112, sixth paragraph. However, the written description fails to clearly link or associate the disclosed structure, material, or acts to the claimed function such that one

of ordinary skill in the art would recognize what structure, material, or acts perform the claimed function.

Applicant is required to:

(a) Amend the claim so that the claim limitation will no longer be a means (or step) plus function limitation under 35 U.S.C. 112, sixth paragraph; or

(b) Amend the written description of the specification such that it clearly links or associates the corresponding structure, material, or acts to the claimed function without introducing any new matter (35 U.S.C. 132(a)); or

(c) State on the record where the corresponding structure, material, or acts are set forth in the written description of the specification that perform the claimed function. For more information, see 37 CFR 1.75(d) and MPEP §§ 608.01(o) and 2181.

Claim Rejections - 35 USC § 103

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 negatived by the manner in which the invention was made.

3. Claim 1, 3-12, 14-23, 25-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lau (5592173) in view of Ranta (6584331).

With regard to claim 1, 12, 23 & 34-35, Lau discloses:

- a processor and memory are connected (see column 6, lines 10-30)
- GPS module coupled to the processor (see column 5-6, lines 63-15)

- Setting a current value of the period of the power-up phase of the GPS dependent on information on the radio position of the mobile device in the wireless network and adaptive prediction of when the GPS should be power on to meet specification on positioning accuracy and GPS time (see column 9, lines 12-65).

Ranta discloses:

- wiereless communication center sending the position error to the mobile device (see column 5-6, lines 48-14)

It would have been obvious to modify Lau by incorporating the teaching of Ranta's system having wireless communication center sending the position error so as to the system is performing position information with power supply more consistency.

With regard to claim 3 & 14, 25 Lau teaches the period of power-up phase is set while retaining the accuracy of position fix within acceptable threshold (see column 7, lines 1-57)

With regard to claim 4, 15, 26, Lau teaches the mobile device determining dynamically an optional period of the power-up phase (see column 9, lines 30-42)

With regard to claim 5-6, 16-17, & 28, Lau teaches that a microprocessor executes pre-coded software program instructions in a conventional manner (see column 9, lines 12-65) which meets the claims

With regard to claim 7, 18, 27, Lau teaches predicting accuracy error and acquisition times of GPS, the device is enable to select time duration of power-up phase (see column 9-10, lines 30-11) which meets the claims

With regard to claim 8, 19, 30, Lau teaches the mobile device comprising a power limited device (see column 7, lines 12-18)

With regard to claim 9, Lau teaches the mobile device comprising an embedded GPS device (see Fig.1).

With regard to claim 10, 21 & 32, Lau teaches a micro-processor making adaptive predictions (see column 9, lines 50-67) which meet the claims

With regard to claim 20, 31, Ranta teaches that the mobile device includes a battery for powering (see column 1, lines 60-67)

With regard to claim 11, 22, 29, 33, Lau teches:

- predicting a next position a next scheduled power-up using a number of last position reported (see column 9, lines 43-48)
- Comparing the predicted position at the next power-up time with an actual positon of the mobile device and determining a position error (see column 9, lines 15-28)
- Storing current values of period of the power-up phase, acquisition time, position error and position in a storage unit of the mobile device (see column 6, lines 26-64).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NGA X. NGUYEN whose telephone number is (571)272-5217. The examiner can normally be reached on 8:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, TARCZA H. THOMAS can be reached on (571) 272-6979. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

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). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NGA X NGUYEN
Examiner
Art Unit 3662

NXN

/Thomas H. Tarcza/
Supervisory Patent Examiner, Art Unit 3662

Notice of References Cited	Application/Control No. 11/661,707	Applicant(s)/Patent Under Reexamination MALANEY, ROBERT ANDERSON	
	Examiner NGA X. NGUYEN	Art Unit 3662	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,592,173	01-1997	Lau et al.	342/357.12
*	B	US-6,584,331	06-2003	Ranta, Jukka	455/574
	C	US-			
	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
	N					
	O					
	P					
	Q					
	R					
	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.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	1	("20090009387").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2010/05/04 09:46
S2	12	malaney-R$.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 09:48
S3	6729	342/357.01-357.17.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 10:10
S4	2214	S3 and position with error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 10:13
S5	6	S4 and (power adj up or power-up) with (set$4 or adjus$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 10:14
S6	42	S3 and period with power with (adjus$4 or set$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 10:24
S7	0	S3 and GPS with predict with power with (adjust or set)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 10:38
S8	43	S3 and GPS with predict and power with (adjust or set)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 10:38

S9	1	S3 and GPS with predict and (power-up or power adj up) with (adjust or set)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 11:01
S10	28	S3 and GPS with predict and (power-up or power adj up)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 11:02
S11	2	"20080150797"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 11:27
S12	5	(("6731701") or ("6775802") or ("6611756") or ("6252545") or ("6965760")).PN.	USPAT; USOCR	OR	OFF	2010/05/04 11:29
S13	5	"1" and mean adj for	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:16
S14	1	("20090009387").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2010/05/07 10:16
S15	0	S14 and mean adj for	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:16
S16	0	S14 and mean	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:16
S17	0	S14 and means	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:17

S18	3680	342/357.06, "357.12", "357".S13.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:38
S19	2327	S18 and (wakeup or power-up or power adj up or standard or normal)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:39
S20	743	S18 and (wakeup or power-up or power adj up or standard or normal) and position with error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:39
S21	112	S18 and (wakeup or power-up or power adj up or standard or normal) with period	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:40
S22	19	S18 and (wakeup or power-up or power adj up or standard adj mode or normal adj mode) with period	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:54
S23	5	"1" and mean adj for	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 13:42
S24	3680	342/357.06, "357.12", "357".S23.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 13:42
S25	19	S24 and (wakeup or power-up or power adj up or standard adj mode or normal adj mode) with period	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 13:42

S26	12	S25 and communication	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 13:42
S27	1	S25 and communication adj network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 13:43
S28	2	S25 and wireless adj network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 13:43
S29	1884	455/343.1-343.6.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 14:16
S30	242	S29 and wireless adj network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 14:17
S31	19	S30 and (wakeup or power-up or power adj up or standard adj mode or normal adj mode) with period	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 14:17
S32	2	S31 and position with error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 14:22
S33	1	S27 and position with error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 14:28

S34	7	S30 and position with error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 14:28

EAST Search History (Interference)

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5/7/2010 3:41:04 PM
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FORM PTO-1449 U. S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTY. DOCKET NO.	SERIAL NO.
	U 016731-5	11/661,707
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	APPLICANT	
	Robert Anderson MALANEY	
(Use several sheets if necessary)	FILING DATE	GROUP
	March 1, 2007	

OIPE IAP6 JAN 24 2008 PATENT & TRADEMARK OFFICE

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	REFERENCE DESIGNATION	DOCUMENT NUMBER	DATE	NAME	FILING DATE IF APPROPRIATE
	AA				
	AB				

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION	
					YES	NO
	AC					
	AD					

OTHER ART (Including Author, Title, Date, Pertinent Dates, Etc.)

/NXN/	AE	Haykin, S. "Neural Networks: A Comprehensive Foundation - 2nd Edition", Prentice Hall, Upper Saddle River, New Jersey, pp. 641-645
	AF	Conner, S., et al. "Building a Wireless World with Mesh Networking Technology" in: *Technology @ Intel*, (November 2003), pp. 1-6
	AG	Ahmavaara, K., et al. "Integration of Wireless LAN and 3G Wireless: Interworking Architecture Between 3GPP and WLAN Systems" in: *IEEE Communication Magazine*, (November 2003), pp. 74-81
	AH	Karygiannis, T., et al. "Wireless Network Security: 802.11, Bluetooth and Handheld Devices" in: *National Institiute of Standards and Technology, Technology Administration U.S. Department of Commerce*, (November 2002), pp. ES-1 - G-3
	AI	Koshima, H., et al. "Finding A Mentally Impaired Relative, A Lost Child, or a Criminal in a Sprawling Metropolitan Area would be Simple if the Person Were Equipped With A Personal Locator Device: Personal Locator Services Emerge" in: *IEEE Spectrum*, (February 2000), pp. 41-48
	AJ	OET Bulletin No. 17 "Guidelines for Testing and Verifying the Accuracy of Wireless E911 Location Systems" Federal Communications Commission USA, (April 2000), pp. 1-12
	AK	Bahl, P., et al. "RADAR: An In-Building RF-based User Location and Tracking System" *Microsoft Research*
	AL	Ladd, A., et al. "Robotics-Based Location Sensing Using Wireless Ethernet" *MOBICOM '02*, (September 2002), Atlanta Georgia, USA
	AM	Patwari, N., et al. "Relative Location Estimation in Wireless Sensor Networks" *IEEE Transactions on Signal Processing*, Vol. 15, (2003), pp. 2137-2148
	AN	Capkun, S., et al. "GPS-free Positioning in Mobile Ad-Hoc Networks" *IEEE*, Proceedings of the 34th Hawaii International Conference on Systems Sciences, (2001), pp. 1-10

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if citation 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.

FORM PTO-1449 U. S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTY. DOCKET NO.	SERIAL NO.
	U 016731-5	11/661,707
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	APPLICANT	
	Robert Anderson MALANEY	
(Use several sheets if necessary)	FILING DATE	GROUP
	March 1, 2007	

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	AA				
	AB				

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION	
					YES	NO
	AC					
	AD					

OTHER ART (Including Author, Title, Date, Pertinent Dates, Etc.)

/NXN/	AE	Krumm, J., et al., "Probabilistic Inferencing for Location" *2003 Workshop on Location-Aware Computing (Part of UbiComp 2003)*, Seattle, WA, USA, (2003)
	AF	"Newbury Networks Debuts First Location-Enabled Networks Solution for 802.11B WLANS", Release Detail Newbury Networks [online], [retrieved on 11/02/2007]. Retrieved from the internet ,<URL: http://www.newburynetworks.com/pr_021102/news_events-news_archive-release_details....>
	AG	Denning, D., et al. "Location-based Authentication: Grounding Cyberspace for Better Security" Computer Fraud & Security [online], [retrieved on 11/01/2007]. Retrieved from the internet, URL: http://www.cs.georgetown.edu/~denning/infosec/Grounding.txt>
	AH	Denning, D., et al. "Using GPS to Enhance Data Security" GPS World - Geo-Encryption (April 2003) [online], [retrieved on 11/01/2007]. Retrieved from the internet, <URL: http://www.gpsworld.com/gpsworld/content/printContentPopup.jsp?id=57975>
	AI	Epstein, K., "How Geo-Encryption Makes Copyright Protection Global" CIOINSIGHT - Global Encryption by Satellite [online], [retrieved on 11/01/2007] Retrieved from the internet, <URL: http://www.coinsight.com/print_article2/0,1217,a=24831,00.asp>
	AJ	van Diggelen, F., et al. "Indoor GPS Technology" Presented at CTIA Wireless-Agenda, Dallas (May 2001), pp. 1-10
	AK	Rappaport, T., "Principles and Practice" in: *Wireless Communications*, Prentice Hall Communications Engineering and Emerging Technology Series, pp. 123-133
	AL	Battiti, R., et al. "Statistical Learning Theory for Location Fingerprinting in Wireless LANs" Technical Report DIT-02-0086, Universita di Trento (October 2002), pp. 1-12
	AM	Royer, E., et al. "A Review of Current Routing Protocols for Ad Hoc Mobile Wireless Networks' in *IEEE Personal Communications* (April 1999), pp. 46-55

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if citation 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.

Form PTO-1449 6-4

FORM PTO-1449 U. S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)	ATTY. DOCKET NO.	SERIAL NO.
	U 016731-5	**11/661,707**
	APPLICANT	
	Robert Anderson MALANEY	
	FILING DATE	GROUP
	March 1, 2007	

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	REFERENCE DESIGNATION	DOCUMENT NUMBER	DATE	NAME	FILING DATE IF APPROPRIATE
	AA				
	AB				

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION	
					YES	NO
	AC					
	AD					

OTHER ART (Including Author, Title, Date, Pertinent Dates, Etc.)

/NXN/	AE	Ziv, J., et al. "Some Lower Bounds on Signal Parameter Estimation" in: *IEEE Transactions on Information Theory*, Vol. 15, (May 1969), pp. 386-391
	AF	"SnapTrack's Wireless Assisted GPS (A-GPS) Solution Provides the Industry's Best Location System" SnapTrack, A QUALCOMM Company, White Paper, pp. 1-3
	AG	Caffery, J., et al. "Wireless Location in CDMA Cellular Radio Systems" *Kluwer Academic Publishers*, Boston, pp. 1-11
	AH	Caffery, J., et al. "Overview of Radiolocation in CDMA Cellular Systems" Georgia Institute of Technology School of Electrical and Computer Engineering, Atlanta, GA, pp. 1-32
	AI	
	AJ	
	AK	
	AL	
	AM	
	AN	

EXAMINER	/Nga Nguyen/	DATE CONSIDERED	05/07/2010

EXAMINER: Initial if citation 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.

Form PTO-1449 6-4

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11661707	MALANEY, ROBERT ANDERSON
	Examiner	Art Unit
	NGA X NGUYEN	3662

SEARCHED			
Class	Subclass	Date	Examiner
342	357.01-357.17	5/4, 7/2010	NXN
455	343.1-343.6	5/7/2010	NXN

SEARCH NOTES		
Search Notes	Date	Examiner
TEXT SEARCH	5/4,7/2010	NXN
PLUS SEARCH	5/7/2010	NXN

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11661707	MALANEY, ROBERT ANDERSON
	Examiner	Art Unit
	NGA X NGUYEN	3662

✓	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	05/07/2010								
	1	✓								
	2	✓								
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	35	✓								
	36	✓								

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11661707	MALANEY, ROBERT ANDERSON
	Examiner	Art Unit
	NGA X NGUYEN	3662

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

11/661707
IAP8 Rec'd PCT/PTO 01 MAR 2007

Practitioner's Docket No. U 016731-5

Optional Customer No. Bar Code

00140
PATENT TRADEMARK OFFICE

CHAPTER II

TRANSMITTAL LETTER
TO THE UNITED STATES ELECTED OFFICE (EO/US)
(ENTRY INTO U.S. NATIONAL PHASE UNDER CHAPTER II)

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/AU2005/001351	31 AUGUST 2005	02 SEPTEMBER 2004

TITLE OF INVENTION
SELF MONITORING GPS ON MOBILE DEVICE

APPLICANT(S)
1. MALANEY, Robert Anderson

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

ATTENTION: EO/US

INFORMATION DISCLOSURE STATEMENT

We draw the attention of the Examiner to the attached English-language version of an Action or International-type Search Report from a foreign office in respect of counterpart

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PCT/AU2005/001351 that indicates the degree of relevance found by the foreign office. The Action or Search Report makes consideration of any non-English art required. MPEP 609.

Form PTO-1449 is also attached with reference copies (first page only for U.S. patent publications).

Respectfully submitted,

WILLIAM R. EVANS
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26 WEST 61ST STREET
NEW YORK, NEW YORK 10023
REG.NO.25,858(212)708-1930

11/661707

Sheet 1 of 1

FORM PTO-1449 U. S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTY. DOCKET NO.	SERIAL NO.
	U 016731-5	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	APPLICANT	
	Robert Anderson MALANEY	
(Use several sheets if necessary)	FILING DATE	GROUP

IAP8 Rec'd PCT/PTO 01 MAR 2007

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	REFERENCE DESIGNATION	DOCUMENT NUMBER	DATE	NAME	FILING DATE IF APPROPRIATE
/NXN/	AA	2003/0083814	05/2003	Gronemeyer	
/NXN/	AB	2003/0107514	06/2003	Syrjarinne, et al.	
/NXN/	AC	6,590,525	07/2003	Yule, et al.	
	AD				
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	AF				
	AG				
	AH				
	AI				
	AJ				
	AK				

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION	
					YES	NO
/NXN/	AL	02/088769	11/2002	WO		
	AM					
	AN					
	AO					
	AP					

OTHER ART (Including Author, Title, Date, Pertinent Dates, Etc.)

	AR	
	AS	
	AT	

EXAMINER	/Nga Nguyen/	DATE CONSIDERED	05/07/2010

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Form PTO-1449 **6-4**

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FORM PTO-1449 U. S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)	ATTY. DOCKET NO.	SERIAL NO.
	U 016731-5	**11/661,707**
	APPLICANT	
	Robert Anderson MALANEY	
	FILING DATE	GROUP
	March 1, 2007	

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	REFERENCE DESIGNATION	DOCUMENT NUMBER	DATE	NAME	FILING DATE IF APPROPRIATE
/NXN/	AA	2002/0091956	07/2002	Potter, et al.	
	AB				
	AC				
	AD				
	AE				
	AF				
	AG				
	AH				
	AI				
	AJ				
	AK				

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION	
					YES	NO
	AL					
	AM					
	AN					
	AO					
	AP					

OTHER ART (Including Author, Title, Date, Pertinent Dates, Etc.)

/NXN/	AR	"How A-GPS Works" (2001) SnapTrack, A QUALCOMM Company, White Paper (http://www.snaptrack.com/pdf/How_aGPS_works.pdf)
/NXN/	AS	"TricklePower" in REFERENCE GUIDELINE TO TF GPS ENGINE BOARD by Laipac Technology, Inc. (2001) (http:///www.laipac.com/datasheets/gps/TF%20GPS%20Series.pdf)
	AT	

EXAMINER	/Nga Nguyen/	DATE CONSIDERED	05/07/2010

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CONFIRMATION NO. 9076

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
11/661,707	02/11/2008 RULE	342	3662	U 016731-5

APPLICANTS
Robert Anderson Malaney, New South Wales, AUSTRALIA;

**** CONTINUING DATA ***************************
This application is a 371 of PCT/AU2005/001351 08/31/2005

**** FOREIGN APPLICATIONS ***************************
AUSTRALIA 20049052024 09/02/2004

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Foreign Priority claimed	35 USC 119(a-d) conditions met	Verified and Acknowledged	Met after Allowance	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
☑ Yes ☐ No	☑ Yes ☐ No	/NGA X NGUYEN/ Examiner's Signature	☐ Initials	AUSTRALIA	6	36	6

ADDRESS

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NEW YORK, NY 10023
UNITED STATES

TITLE

Self Monitoring Gps on Mobile Device

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Robert Anderson MALANEY

Serial No.: 11/661,707 Group No.: 3662

Filed: February 11, 2008 Examiner: N. Nguyen

For: SELF MONITORING GPS ON MOBILE DEVICE

Attorney Docket No.: U 016731-5

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

RESPONSE TO OFFICE ACTION

Applicant petitions to extend the time for response to the Office Action of May 19, 2010, to November 19, 2010. Please charge the amount of $555.00 in payment of the extension fee, and charge any additional fee and credit any overpayment, to our Deposit Account 12-0425.

In response to that Office Action, please amend the above-identified application as follows, and consider the Remarks presented herein.

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/Raymond A. DiPerna/
Signature

Date: November 7, 2010

Raymond A. DiPerna
(type or print name of person certifying)

IN THE CLAIMS

The following is a complete listing of the claims, and replaces all earlier versions and listings.

1. (currently amended) A method of acquiring GPS on a mobile device for a wireless network, said mobile device possessing GPS capability and wireless communications capability for said wireless network, said method comprising the step of:

setting a current value of [[the]] a period of [[the]] a power-up phase of said GPS dependent on ~~information on the radio position of the mobile device in the wireless network determined from the wireless network~~ a current radio position and error and adaptive predictions of when said GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time~~, said specifications being statistical bounds~~.

2. (currently amended) The method according to claim 1, wherein ~~setting said current value is also dependent upon~~ the current radio position and error are determined using Cramer-Rao ~~Bound information on the radio position~~ Bounds.

3. (previously presented) The method according to claim 1, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable statistical bounds.

4. (previously presented) The method according to claim 1, wherein said mobile device determines dynamically an optimal period of the power-up phase.

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5. (previously presented) The method according to claim 1, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

6. (previously presented) The method according to claim 5, wherein said adaptive-filter and machine learning techniques are implemented using said mobile device.

7. (previously presented) The method according to claim 1, wherein said setting step comprises:

if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

if at least one of predicted accuracy error and predicted acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

8. (previously presented) The method according to claim 1, wherein said mobile device comprises a power limited device.

9. (previously presented) The method according to claim 1, wherein said mobile device comprises an embedded GPS device.

10. (currently amended) The method according to claim 1, <u>further</u> comprising the step of making adaptive predictions using a neural network.

11. (currently amended) The method according to claim 1, wherein said setting step comprises:

predicting a next position at a next scheduled power-up time using a number of last positions reported;

comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

storing current values of said period of the power-up phase, acquisition time, position error, and position in a storage unit of said mobile device.

12. (currently amended) A mobile device for a wireless network, said mobile device possessing wireless communications capability for said wireless network, comprising:

a processor; ~~and~~

a memory coupled to said processor;

a GPS module coupled to said processor providing a GPS capability for said mobile device; and

means for setting a current value of [[the]] a period of [[the]] a power-up phase of said GPS dependent on ~~information on the radio position of the mobile device in the wireless network determined from the wireless network~~ the current radio position and error and adaptive predictions of when said GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time~~, said specifications being statistical bounds~~.

13. (currently amended) The mobile device according to claim 12, wherein ~~setting said current value is also dependent upon~~ the current radio position and error are determined using Cramer-Rao ~~Bound information on the radio position~~ Bounds.

14. (previously presented) The mobile device according to claim 12, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable statistical bounds.

15. (previously presented) The mobile device according to claim 12, wherein said mobile device determines dynamically an optimal period of the power-up phase.

16. (previously presented) The mobile device according to claim 12, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

17. (previously presented) The mobile device according to claim 16, wherein said adaptive-filter and machine-learning techniques are implemented using said mobile device.

18. (previously presented) The mobile device according to claim 12, wherein said setting means comprises:

means for, if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

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means for, if at least one of predicted accuracy error and predicted acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

19. (previously presented) The mobile device according to claim 12, wherein said mobile device comprises a power limited device.

20. (previously presented) The mobile device according to claim 19, further comprising a battery for powering said mobile device.

21. (currently amended) The mobile device according to claim 12, further comprising a neural network module for making adaptive predictions.

22. (currently amended) The mobile device according to claim 12, wherein said setting means comprises:

means for predicting a next position at a next scheduled power-up time using a number of last positions reported;

means for comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

means for storing current values of a period of the power-up phase, acquisition time, position error, and position in a storage unit of said mobile device.

23. (currently amended) A computer program product for a mobile device for a wireless network, said mobile device possessing GPS capability and wireless communications capability for said wireless network, said computer program product having a computer readable medium storing a computer program for acquiring GPS on said mobile device, comprising:

computer program code means for interfacing with the GPS capability of said mobile device; and

computer program code means for setting a current value of the period of the power-up phase of said GPS dependent on ~~information on the radio position of the mobile device in the wireless network determined from the wireless network~~ a current radio position and error and adaptive predictions of when said GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time~~, said specifications being statistical bounds~~.

24. (currently amended) The computer program product according to claim 23, wherein ~~setting said current value is also dependent upon~~ the current radio position and error are determined using Cramer-Rao ~~Bound information on the radio position~~ Bounds.

25. (previously presented) The computer program product according to claim 23, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable statistical bounds.

26. (previously presented) The computer program product according to claim 23, wherein said computer program product determines dynamically an optimal period of the power-up phase.

27. (previously presented) The computer program product according to claim 23, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

28. (currently amended) The computer program product according to claim 27, wherein said adaptive-filter and ~~machine learning~~ machine-learning techniques are implemented using said mobile device.

29. (previously presented) The computer program product according to claim 23, wherein said computer program code means for setting comprises:

computer program code means for, if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

computer program code means for, if at least one of predicted accuracy error and predicted acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

30. (previously presented) The computer program product according to claim 23, wherein said mobile device comprises a power limited device.

31. (previously presented) The computer program product according to claim 30, wherein said mobile device comprises a battery for powering said mobile device.

32. (currently amended) The computer program product according to claim 23, further comprising computer program code means for providing a neural network module to make adaptive predictions.

33. (currently amended) The computer program product according to claim 23, wherein said computer program code means for setting comprises:

computer program code means for predicting at a next position a next scheduled power-up time using a number of last positions reported;

computer program code means for comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

computer program code means for storing current values of a period of the power-up phase, acquisition time, position error, and position in a storage unit of said mobile device.

34. (currently amended) A method of acquiring GPS on a mobile device for a wireless network, said mobile device possessing GPS capability and wireless communications capability for said wireless network, said method comprising the steps of:

using a position error of said mobile device in the wireless network determined from the wireless network;

if the position error is too large, adjusting a current value of [[the]] a period of [[the]] a power-up phase of said GPS downward;

if the position error is too small, adjusting the current value of said period of the power-up phase of said GPS upward;

estimating using a neural network a new value of said period of the power-up phase of said GPS dependent upon said position error; and

setting a new value of said period of the power-up phase of said GPS to a weighted value dependent upon an acceptable error bound.

35. (currently amended) A method of acquiring GPS on a mobile device for a wireless network, said mobile device possessing GPS capability and wireless communications capability for said wireless network, said method comprising the steps of:

using an acquisition time at a last position fix of the mobile device in the wireless network determined from the wireless network;

if the acquisition time is too large, adjusting a current value of [[the]] a period of [[the]] a power-up phase of said GPS downward;

if the acquisition time is too small, adjusting the current value of said period of the power-up phase of said GPS upward;

estimating using a neural network a new value of said period of the power-up phase of said GPS dependent upon said acquisition time; and

setting a new value of said period of the power-up phase of said GPS to a weighted value dependent upon an acceptable bound.

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36. (previously presented) The method according to claim 34, wherein the position error is the Cramer-Rao Bound on the radio position of the mobile device.

37. - 40. (canceled)

REMARKS

Introduction and status of claims

• Claims 1-36 are pending in this application.

• Claims 1, 2, 10-13, 22-24, 28, and 32-35 have been amended to define still more clearly what Applicant regards as his invention.

• Support for the claim amendments is discussed in the Appendix to this Response.

• Claims 1, 12, 23, 34, and 35 are in independent form.

The rejections under 35 U.S.C. § 112

• Claims 2, 5, 6, 10, 12, 13, 24, 28, 32, 34, and 35 were 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. The Examiner's reasoning is provided at page 2 of the Office Action.

The claims have been carefully reviewed and amended as deemed necessary to ensure that they conform fully to the requirements of Section 112, second paragraph, with special attention to the points raised at paragraphs 1 and 2 of the Office Action.

Applicant also has the following comments in particular. Responses are made in order of the listing of claim rejections in the Office Action, for ease of reference.

In relation to the rejection of claim 12, amended claim 12 recites "...a processor; a memory coupled to said processor; ..." as amended. Support for this amendment is provided at least by Fig. 6 of the present application (see processing unit 666 and memory 670), and the specification at page 17, lines 6-25.[1]

Furthermore, claim 12 has been amended by deleting "... , said specifications being statistical bounds"; likewise, independent claims 1 and 23 have also been amended in this regard. Nonetheless, see page 1, lines 20-24, of the instant patent specification, stating that:

> The FCC requirements set specific statistical requirements on the position accuracy on any technology. Currently the FCC's E-911 Phase II Plans dictate that 67% of all attempts for a position location must have an accuracy of less than 50 m, and 95% of calls must have an accuracy of less than 150m (Federal Communications Commission E-911 http://www.fcc.gov/911/enhanced/)."

In relation to the rejection of claims 10, 21, 32, 34, and 35, it is submitted that the rejected claims do particularly point out and distinctly claim the invention, as the term "neural network" (and neural network module) would be well understood by a person having ordinary skill in the art, especially in the contexts used in the claims. It is submitted that the term "neural network" is well known in the field of information theory. The term is used throughout the specification and in the drawings. See the *Haykin* reference, cited in the Information Disclosure Statement and mentioned in the specification at page 14, lines 17-20 for details of adaptive prediction algorithms and neural networks. Neural networks have been an entire field of study for 30 years or so. The *Haykin* reference is considered to be one of the

[1]It is of course to be understood that the references to various portions of the present application are by way of illustration and example only, and that the claims are not limited by the details shown in the portions referred to.

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main texts used by students; see the following wikipedia link for history and other references: http://en.wikipedia.org/wiki/Neural_network. The same applies for other terms such "Cramer-Rao" and "machine-learning," etc., which are standard terminology.

In relation to the rejection of claims 2, 13, and 24, it is submitted that the rejected claims do particularly point out and distinctly claim the invention, as the term "Cramer-Rao Bound" would be well understood by a person having ordinary skill in the art, especially in the contexts used in the claims. The term is used throughout the specification and in the drawings. The phrase is a term of art in estimation theory and statistics and would be well understood by a person skilled in the art. Furthermore, each of the rejected claims has been clarified to recite "Cramer-Rao Bounds." See, for example, the *Patwari, N.*, et al. reference cited in the Information Disclosure Statement.

In relation to the rejection of claims 5, 6, and 28, it is submitted that the rejected claims do particularly point out and distinctly claim the inventionm as the term "adaptive-filter and machine-learning techniques" would be well understood by a person having ordinary skill in the art, especially in the contexts used in the claims. The term is used throughout the specification and in the drawings. Further, adaptive-filter techniques and machine-learning techniques are well known in the art. See, for example, the *Krumm* et al. reference cited in the Information Disclosure Statement.

In paragraph 2, claims 12, 18, 22, 23, 29, and 33 were rejected under 35 USC § 112, second paragraph, as failing to clearly link or associate the disclosed structure, material, or acts to the function recited in a claim limitation invoking 35 U.S.C. § 112, paragraph 6. Responses are made in order of the listing of claim rejections in the Office Action for ease of

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Google LLC et al v. Nariste Networks Pty. Ltd.

reference. It is submitted that the rejected claims do particularly point out and distinctly claim the invention.

The Office Action makes no specific reference to the wording of the rejected claims nor does it provide a basis for the rejection other than the simple assertion that the claims are rejected.

Claim 12 recites "means for setting a current value of a period of a power-up phase of said GPS ...." Fig. 1 illustrates a GPS-equipped mobile device 100 with which an embodiment of the invention can be practiced. Specific devices are described from page 8, line 27, to page 9, line 4. Furthermore, this passage states "... software is embedded in a mobile device to self monitor the period of the power up phase ... for the device, and to self-adjust the value of [power-up phase]." Furthermore, original claims 14 and 15 provide details of how the current value is set. Fig. 2 illustrates a system for adaptively predicting when a GPS-enabled wireless communication device should be powered on. Fig. 4 illustrates in detail a process of determining the value of power-up phase. See page 10, line 23, to page 12, line 2, for example, for details. Fig. 6 is a block diagram of a computer system with which an embodiment of the invention may be practiced. See, e.g., page 16, line 25, to page 18, line 22.

The foregoing applies similarly to claim 23.

Claim 18 recites "means for, if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and means for, if at least one of predicted accuracy error and predicted

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acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase." The comments above regarding Figs. 1, 2, and 6 apply similarly to this claim. Figs. 4 and 5 illustrate methods of determining the power-up phase value to satisfy position accuracy bounds and GPS acquisition time bounds. See, for example, steps 412, 414, 416, and 418, as well as steps 512, 514, 516, and 518.

The foregoing applies similarly to claim 29.

Claim 22 recites "means for predicting a next position at a next scheduled power-up time using a number of last positions reported; means for comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and means for storing current values of a period of the power-up phase, acquisition time, position error and position in a storage unit of said mobile device." Again, Fig. 1 illustrates a GPS-equipped mobile device 100 with which an embodiment of the invention can be practiced. Specific devices are described from page 8, line 27, to page 9, line 4. Furthermore, this passage states "... software is embedded in a mobile device to self monitor the period of the power up phase ... for the device, and to self-adjust the value of [power-up phase]." Fig. 3 illustrates a process of determining position errors. See, e.g., the steps 310, 320, and 330, described from page 9, line 27, to page 10, line 22.

The foregoing applies similarly to claim 33.

For at least the foregoing reasons, it is believed that the rejection under Section 112, second paragraph, has been obviated, and its withdrawal is therefore respectfully requested.

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The rejections under 35 U.S.C. § 103(a)

• At paragraph 3 of the Office Action, claims 1, 3-12, 14-23, and 25-35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,592,173 to Lau in view of U.S. Patent No. 6,584,331 to Ranta.

Applicant submits that independent claims 1, 12, 23, 34, and 35, together with the claims dependent therefrom, are patentably distinct from the cited references for at least the following reasons.

The claimed invention defined by claim 1 is a method of acquiring GPS on a mobile device for a wireless network, wherein the mobile device possesses a GPS capability and a wireless communications capability for the wireless network. A current value of the period of the power-up phase of the GPS is set dependent on the current radio position and error and adaptive predictions of when the GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

Neither the Lau et al. reference nor the Ranta reference, whether considered either alone or in any permissible combination (if any) would disclose or suggest the claimed invention, which uses location error (location accuracy) as determined from the wireless network to provide GPS power savings. By virtue of the features of the claimed invention, superior outcomes in power savings can be produced relative to the Lau et al and Ranta references.

Lau et al Reference

Lau et al discusses a GPS receiver that takes `user inputs' to switch a GPS unit between low and normal power supply (see column 9, lines 23-24). The user inputs are described in Lau et al as one of three inputs:

(i) The user manually pressing a key switch (see col. 7, lines 20-24);

(ii) The user entering the application that will be used, such as vehicle or marine use, which then sets a predefined standby period (see col. 9, lines 30-42); and

(iii) The use of a 'dead reckoning device' that attempts to determine the rate of change of location (see col. 7, lines 24-27).

The two inputs (i) and (ii) lead to a power control system effectively the same as TricklePower, stated in the instant specification from page 2, line 30, to page 3, line 9, where the user can select the power-down period.

Using the input (iii) of dead reckoning is a means to estimate current location from previous last known positions by estimating a straight-line movement. This dead reckoning device is embedded in the mobile device itself and uses no other external inputs.

The Lau et al reference does not disclose using position information, or more particularly, position error, as determined by the wireless network as one of the inputs to control the GPS power supply. The use of position error as determined by a wireless network as an input leads to a much enhanced power savings.

For example, the system of Lau et al would power on the GPS if the dead reckoning algorithm determined the device was moving significantly (i.e., a significant rate of change of location information). The method of Lau et al would turn on and keep on the GPS. In the claimed invention, the wireless network would determine the accuracy of the current position

even at a significant rate of change of location information. In marked contrast to Lau et al, if the wireless network location accuracy was good enough, the GPS power supply would stay off in the claimed invention.

Ranta Reference

Ranta discusses a method to determine whether a mobile device is moving and then to use that information to control a GPS power supply. The Office Action states on page 4 that Ranta discloses:

- wireless communication center sending the position error to the mobile device (see column 5-6, lines 48-14)

However, a careful review of Ranta indicates that the cited reference contains no such teaching. Ranta does not mention the term 'position error' anywhere, and never discloses the notion of position error or position accuracy anywhere. The specific reference to column 5-6, lines 48-14 of Ranta describes a method to determine whether a device is stationary or in motion. The only errors Ranta utilizes are related to block error rate (BLER) and bit error rate (BER). These two errors are information errors on the coded message and bear no relation whatsoever to position error or location accuracy.

In marked contrast, the claimed invention relates to a method of using position error reported by a wireless network to control GPS power supply. That these methods are totally distinct from each other can be seen from the following real-world example. Consider where a device moves constantly over a distance of 10km. Imagine the mobile application requires only a 100-meter location accuracy. In the Ranta system, the motion would be detected and the GPS power supply would be turned on. In the claimed invention, however, the system would determine the wireless network position error and report that to the mobile. If the

reported error was less than 100 meters, the GPS power would not be turned on. The system of the Ranta system and the claimed invention would deliver opposite outcomes. Clearly, the claimed invention would deliver far superior outcome in terms of power saving.

It is therefore submitted that Lau et al, Ranta, or a combination of the two references, would not disclose or teach the claimed invention defined by independent claim 1. Accordingly, independent claim 1 is seen to be clearly in condition for allowance.

Furthermore, independent claims 12 and 23 similarly track on method claim 1 but define different subject matter and are themselves in condition for allowance for the same reasons. Independent claim 34 is a method claim that is in condition for allowance for similar reasons.

Regarding independent claim 35, neither of the cited references discloses or teaches the use of acquisition time for estimating and setting a new value of power-up period. Acquisition time is an important factor for many applications, especially in emergency situations where one would want to obtain a location fix within 30 seconds. A trivial solution would be to simply keep the GPS system powered on at all times. However, severe battery drain would ensue. The other trivial solution - switching GPS on just when a location is required - typically leads to acquisition times on the order of 2-5 minutes, which is an unacceptable solution for many applications. In contrast, the claimed invention obtains a location fix within the acquisition time required by the application (or set by the user) while at the same time minimizing the power required by the GPS unit. Claim 35 specifically teaches how to adjust the period of the power-up phase so as to meet an acquisition time bound while minimizing energy usage.

The Office Action states "Lau teaches predicting accuracy error and acquisition times of GPS," citing columns 9-10 lines 30-11. However, no mention of "acquisition" times is found in Lau et al. The "acquisition time" is a completely different variable from "off time" or "standby time." Acquisition time refers to the length of time required to obtain an actual position fix following a request to the device for a position, whereas off-time or standby-time refer simply to the period of time a device is powered down.

One could minimize standby mode in order to reduce accumulation of position error (as in Lau et al) - but this feature bears no relation at all to a feature that attempts to obtain a required acquisition time as detailed in the claimed invention. Lau et al does not use in any form of position, or position error, as determined from an independent wireless network in his features, contrary to the claimed invention.

It is therefore submitted that Lau et al, Ranta, or a combination of the two references, would not disclose or teach the claimed invention defined by independent claim 35. Accordingly, independent claim 35 is seen to be clearly in condition for allowance.

The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

Page 305 of 448 (IPR2023-01374)
Google LLC et al v. Nariste Networks Pty. Ltd.

Conclusion

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and early passage to issue of the present application.

Respectfully submitted,

/Raymond A. DiPerna/

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Appendix to Response filed on November 7, 2010
U.S. Appln No. 11/661,707

Support for the proposed claim amendments is provided in the present specification and drawings at least as follows. It is of course to be understood that the references to various portions of the present application are by way of illustration and example only, and that the claims are not limited by the details shown in the portions referred to.

Claim	Amendment	Support
1.	Delete "information on the radio position of the mobile device in the wireless network determined from the wireless network and insert "the current radio position and error" in the "setting" step.	See page 9, lines 20-26. Also, see Fig. 2, step 220
1.	Delete ", said specifications being statistical bounds" in the "setting" step.	See claim 1, as originally filed (in PCT patent application).
2.	Delete "setting said current value is also dependent upon" and insert "the current radio position and error are determined using"; and delete "Bound information on the radio position" and insert "Bounds".	See page 9, lines 20-26. Also, see Fig. 2, step 220
11.	Insert "at" after "predicting a next position".	Minor grammatical correction. See for example step 310 of Fig. 3.
12.	Revise "a processor and memory coupled to said processor" to read "a processor; a memory coupled to said processor;".	Minor grammatical correction. See for example processing unit 666 and memory 670 of Fig. 6.
12 & 23	Same amendments as made to claim 1.	See comments above in respect of claim 1.
13 & 24	Same amendments as made to claim 2.	See comments above in respect of claim 2.

Page 307 of 448 (IPR2023-01374)
Google LLC et al v. Nariste Networks Pty. Ltd.

Claim	Amendment	Support
22 & 33	Insert "at" after "predicting a next position".	Minor grammatical correction. See for example step 310 of Fig. 3.

Electronic Patent Application Fee Transmittal	
Application Number:	11661707
Filing Date:	11-Feb-2008
Title of Invention:	Self Monitoring Gps on Mobile Device
First Named Inventor/Applicant Name:	Robert Anderson Malaney
Filer:	William R. Evans/Raymond DiPerna
Attorney Docket Number:	U 016731-5
Filed as Small Entity	

U.S. National Stage under 35 USC 371 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 - 3 months with $0 paid	2253	1	555	555

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**555**

Electronic Acknowledgement Receipt	
EFS ID:	8785282
Application Number:	11661707
International Application Number:	
Confirmation Number:	9076
Title of Invention:	Self Monitoring Gps on Mobile Device
First Named Inventor/Applicant Name:	Robert Anderson Malaney
Customer Number:	00140
Filer:	William R. Evans/Raymond DiPerna
Filer Authorized By:	William R. Evans
Attorney Docket Number:	U 016731-5
Receipt Date:	07-NOV-2010
Filing Date:	11-FEB-2008
Time Stamp:	17:28:09
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$555
RAM confirmation Number	6459
Deposit Account	120425
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1		U0167315Response11072010.pdf	805266 64a25cc4e7b6ca4324321d808f0f6c20dab63a2f	yes	24

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	11
Applicant Arguments/Remarks Made in an Amendment	12	24

Warnings:

Information:

2	Fee Worksheet (PTO-875)	fee-info.pdf	30088 aec8b7434158a3fe23fe4e8454adf46d955804b9	no	2

Warnings:

Information:

Total Files Size (in bytes):	835354

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.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. 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	Filing Date	To be Mailed
11/661,707	02/11/2008	☐

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☒ RATE ($)	SMALL ENTITY ☒ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ 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), (i), 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

AMENDMENT 11/07/2010	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 36	Minus	** 36	= 0	X $26 =	0	OR	X $ =	
Independent (37 CFR 1.16(h))	* 5	Minus	***9	= 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	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) 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:
/MAMYE WAGSTAFF/

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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Robert Anderson MALANEY

Serial No.: 11/661,707 Group No. 3662

Filed: February 11, 2008 Examiner: N. Nguyen

For: SELF MONITORING GPS ON MOBILE DEVICE

Attorney Docket No.: U 016731-5

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

INFORMATION DISCLOSURE STATEMENT

In compliance with the duty of disclosure under 37 C.F.R. § 1.56 and in accordance with the practice under 37 C.F.R. §§ 1.97 and 1.98, the Examiner's attention is directed to the documents listed on the attached Form PTO-1449. Copies of the listed documents are also attached (first page only for the listed U.S. Patent Documents).

CERTIFICATION UNDER 37 C.F.R. 1.8(a) and 1.10*
*(When using Express Mail, the Express Mail label number is **mandatory**; Express Mail certification is optional.)*

I hereby certify that, on the date shown below, this correspondence is being:

MAILING

☐ deposited with the United States Postal Service in an envelope addressed to the Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.

37 C.F.R. 1.8(a)

☐ with sufficient postage as first class mail.

TRANSMISSION

☐ transmitted by facsimile to the Patent and Trademark Office. to **(571)-273-8300**

37 C.F.R. 1.10*

☐ as "Express Mail Post Office to Address" Mailing Label No. _____ (**mandatory**)

EFS-WEB

☒ transmitted electronically

Date: November 12, 2010

Signature

Raymond A. DiPerna
(type or print name of person certifying)

Each of the listed references was cited in an extended European Search Report from the European Patent Office in respect of corresponding EP Application No. 05777708.8. A copy of the extended Search Report (which is in English) is attached.

We also attach an Office Action in respect of Chinese corresponding Application No. 2005800367823 and an English-language version thereof.

CONCLUSION

It is respectfully requested that the above information be considered by the Examiner and that a copy of the enclosed Form PTO-1449 be returned indicating that such information has been considered.

Please charge the required fee of $180.00 to cover the Information Disclosure Statement under 37 C.F.R. § 1.97(c)(2) to our Deposit Account No. 12-0425.

Respectfully submitted,

Raymond A. DiPerna
c/o Ladas & Parry LLP
26 West 61st Street
New York, New York 10023
Reg. No. 44063
Tel. No. (212) 708-1950

Substitute for form 1449/PTO and PTO/SB/08				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(use as many sheets as necessary)*				**Application Number**	11/661,707
				Filing Date	11 February, 2008
				First Named Inventor	**MALANEY**, Robert Anderson
				Art Unit	3662
				Examiner Name	Nguyen, Nga X
Sheet	1	of	2	Attorney Docket No	**U 016731-5**

US PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US-6,298,229 B1	10-02-2001	Tomlinson Jr Harold Woodruff [US] et al	1, 12, 23, 34, 35
		US-5,864,315 A	01-26-1999	Welles II Kenneth Brakeley [US] et al	1, 12, 23, 34, 35
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
		GB 2 394 134 A	04-14-2004	ParthusCeva Ireland Ltd	1, 12, 23, 34, 35	

Examiner Signature		Date Considered	

*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 Kinds 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. This collection of information is required by 37 CFR 1.97 and 1.98. 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. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

[3119639]:wxb

Substitute for form 1449/PTO and PTO/SB/08				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(use as many sheets as necessary)*				**Application Number**	11/661,707
				Filing Date	11 February, 2008
				First Named Inventor	**MALANEY**, Robert Anderson
				Art Unit	3662
				Examiner Name	Nguyen, Nga X
Sheet	2	of	2	Attorney Docket No	**U 016731-5**

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials *	Cite No[1]	Include name of Author (in CAPITALS), title of the article, (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
		Chinese First Office Action, 20 November, 2009 – State Intellectual Property Office of P.R.C. and English translation	
		European Communication, 28 May, 2010 – European Patent Office	

Examiner Signature		Date Considered	

*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] Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. 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.
SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

[3119639]:wxb

Electronic Patent Application Fee Transmittal	
Application Number:	11661707
Filing Date:	11-Feb-2008
Title of Invention:	Self Monitoring Gps on Mobile Device
First Named Inventor/Applicant Name:	Robert Anderson Malaney
Filer:	William R. Evans/Olivia Stanford
Attorney Docket Number:	U 016731-5
Filed as Large Entity	

U.S. National Stage under 35 USC 371 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($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt	
EFS ID:	8823613
Application Number:	11661707
International Application Number:	
Confirmation Number:	9076
Title of Invention:	Self Monitoring Gps on Mobile Device
First Named Inventor/Applicant Name:	Robert Anderson Malaney
Customer Number:	00140
Filer:	William R. Evans/Olivia Stanford
Filer Authorized By:	William R. Evans
Attorney Docket Number:	U 016731-5
Receipt Date:	12-NOV-2010
Filing Date:	11-FEB-2008
Time Stamp:	11:27:29
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$180
RAM confirmation Number	17661
Deposit Account	120425
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Information Disclosure Statement (IDS) Filed (SB/08)	4FL-IR5570-Exchange-11122010-112246.pdf	2006344 503d45320a6f4e5f56a34c9aa0d3c95e7730c5a1	no	43
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
2	Fee Worksheet (PTO-875)	fee-info.pdf	30052 a3764838d788ab526734b3059604e0e6e28d75e9	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	2036396		

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
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/661,707	02/11/2008	Robert Anderson Malaney	U 016731-5	9076

140 7590 01/20/2011

LADAS & PARRY LLP
26 WEST 61ST STREET
NEW YORK, NY 10023

EXAMINER	
NGUYEN, NGA X	
ART UNIT	PAPER NUMBER
3662	

NOTIFICATION DATE	DELIVERY MODE
01/20/2011	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):

nyuspatactions@ladas.com

PTOL-90A (Rev. 04/07)

Office Action Summary	Application No.	Applicant(s)	
	11/661,707	MALANEY, ROBERT ANDERSON	
	Examiner	Art Unit	
	NGA X. NGUYEN	3662	

-- 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 *11/07/2077*.

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) *1-36* 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) *1-33* is/are rejected.

7)☒ Claim(s) *34-36* 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 *01 March 2007* 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: _____.

Claim Rejections - 35 USC § 102

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.

1. Claim 1- 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Lau (5592173).

With regard to claim 1, 12, 23, Lau discloses a mobile device processing GPS and wireless communication capability (see fig.1):

- A processor (see column 6, lines 14-16)
- A memory coupled to the processor (see column 6, lines 27-30)
- A GPS module coupled to the processor providing a GPS capability for the mobile device (see column 6, lines 7-12)
- Setting a current value of a period of a power-up phase of the GPS dependent on a current radio position and error and adaptive prediction (see column 9-10, lines 11-11).

With regard to claim 2, 13 Lau teaches the current radio position and error are determined by estimate the variance of biased (see column 10, lines 25-43).

With regard to claim 3, 14, 25 Lau teaches the period of power-up phase is set while retaining the accuracy of position fix within acceptable threshold (see column 7, lines 1-57)

With regard to claim 4, 15, 26, Lau teaches the mobile device determining dynamically an optional period of the power-up phase (see column 9, lines 30-42)

With regard to claim 5-6, 16-17, & 28, Lau teaches that a microprocessor executes pre-coded software program instructions in a conventional manner (see column 9, lines 12-65) which meets the claims

With regard to claim 7, 18, 27, Lau teaches predicting accuracy error and acquisition times of GPS, the device is enable to select time duration of power-up phase (see column 9-10, lines 30-11) which meets the claims

With regard to claim 8, 19, 30, Lau teaches the mobile device comprising a power limited device (see column 7, lines 12-18)

With regard to claim 9, Lau teaches the mobile device comprising an embedded GPS device (see Fig.1).

With regard to claim 10, 21 & 32, Lau teaches a micro-processor making adaptive predictions (see column 9, lines 50-67) which meet the claims.

With regard to claim 20, 31, Lau teaches that the mobile device includes a battery for powering (see Fig.1)

With regard to claim 11, 22, 29, 33, Lau teaches:

- predicting a next position a next scheduled power-up using a number of last position reported (see column 9, lines 43-48)
- Comparing the predicted position at the next power-up time with an actual position of the mobile device and determining a position error (see column 9, lines 15-28)

- Storing current values of period of the power-up phase, acquisition time, position error and position in a storage unit of the mobile device (see column 6, lines 26-64).

Allowable Subject Matter

2. Claim 34-36 are allowed. The following is an examiner's statement of reasons for allowance: The closest prior arts does not teach or make obvious:

- "Using a position error …"
- "If the position error is too large, …"
- If the position error is too small, …."

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 submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Amendment

3. Applicant's arguments with respect to claims 1-36 have been considered but are moot in view of the new ground(s) of rejection.

4. 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 NGA X. NGUYEN whose telephone number is (571)272-5217. The examiner can normally be reached on 8:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, TARCZA H. THOMAS can be reached on (571) 272-6979. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NGA X NGUYEN
Examiner
Art Unit 3662

NXN

/Thomas H. Tarcza/
Supervisory Patent Examiner, Art Unit 3662

Notice of References Cited	Application/Control No. 11/661,707	Applicant(s)/Patent Under Reexamination MALANEY, ROBERT ANDERSON	
	Examiner NGA X. NGUYEN	Art Unit 3662	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,592,173	01-1997	Lau et al.	342/357.74
	B	US-			
	C	US-			
	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
	N					
	O					
	P					
	Q					
	R					
	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.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
		355/343.1-343.5.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/11 13:05
		342/343.1-343.5.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/11 13:05
L1	1937	455/343.1-343.5.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/11 13:05
L2	248	1 and power adj up	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/11 13:06
L3	56	1 and power adj up and position and error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/11 13:06
L4	11	3 and GPS	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/11 13:07
L5	2	("5592173").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/01/11 13:26

L6	201	("4449248" | "5101510" | "5128938" | "5291542" | "5418537" | "5448773").PN. OR ("5592173").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/01/11 13:26
L7	22	6 and wireless adj network and GPS	US-PGPUB; USPAT; USOCR	OR	OFF	2011/01/11 13:26
L8	5	7 and power with up	US-PGPUB; USPAT; USOCR	OR	OFF	2011/01/11 13:27
L9	1	5 and position and error	US-PGPUB; USPAT; USOCR	OR	OFF	2011/01/11 13:28
L10	0	9 and wireless	US-PGPUB; USPAT; USOCR	OR	OFF	2011/01/11 13:46
L11	0	9 and network	US-PGPUB; USPAT; USOCR	OR	OFF	2011/01/11 13:46
S1	1	("20090009387").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2010/05/04 09:46
S2	12	malaney-R$.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 09:48
S3	6729	342/357.01-357.17.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 10:10
S4	2214	S3 and position with error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 10:13
S5	6	S4 and (power adj up or power-up) with (set$4 or adjus$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 10:14
S6	42	S3 and period with power with (adjus$4 or set$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 10:24

S7	0	S3 and GPS with predict with power with (adjust or set)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 10:38
S8	43	S3 and GPS with predict and power with (adjust or set)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 10:38
S9	1	S3 and GPS with predict and (power-up or power adj up) with (adjust or set)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 11:01
S10	28	S3 and GPS with predict and (power-up or power adj up)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 11:02
S11	2	"20080150797"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 11:27
S12	5	(("6731701") or ("6775802") or ("6611756") or ("6252545") or ("6965760")).PN.	USPAT; USOCR	OR	OFF	2010/05/04 11:29
S13	5	"1" and mean adj for	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:16
S14	1	("20090009387").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2010/05/07 10:16
S15	0	S14 and mean adj for	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:16

S16	0	S14 and mean	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:16
S17	0	S14 and means	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:17
S18	3680	342/357.06, "357.12", "357".S13.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:38
S19	2327	S18 and (wakeup or power-up or power adj up or standard or normal)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:39
S20	743	S18 and (wakeup or power-up or power adj up or standard or normal) and position with error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:39
S21	112	S18 and (wakeup or power-up or power adj up or standard or normal) with period	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:40
S22	19	S18 and (wakeup or power-up or power adj up or standard adj mode or normal adj mode) with period	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:54
S23	5	"1" and mean adj for	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 13:42

S24	3680	342/357.06, "357.12", "357".S23.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 13:42
S25	19	S24 and (wakeup or power-up or power adj up or standard adj mode or normal adj mode) with period	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 13:42
S26	12	S25 and communication	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 13:42
S27	1	S25 and communication adj network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 13:43
S28	2	S25 and wireless adj network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 13:43
S29	1884	455/343.1-343.6.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 14:16
S30	242	S29 and wireless adj network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 14:17
S31	19	S30 and (wakeup or power-up or power adj up or standard adj mode or normal adj mode) with period	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 14:17

S32	2	S31 and position with error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 14:22
S33	1	S27 and position with error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 14:28
S34	7	S30 and position with error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 14:28
S35	7675	342/357.2-357.78.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/07 17:08
S36	35	S35 and power with up and gps with prediction	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/07 17:09
S37	1	S35 and power with up and gps with prediction and cramer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/07 17:21
S38	4	S35 and power with up with prediction	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/07 17:22
S39	22	("5731786" | "5798732" | "5847680" | "6118977" | "6252545" | "6295023").PN. OR ("6775802").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/01/07 17:24
S40	164	power with up and gps with prediction	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/07 17:26

S41	7676	342/357.2-357.78.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/10 13:14
S42	1	S41 and power with on and position and error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/10 13:14
S43	853432	S41 and wake with mode position and error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/10 13:15
S44	85	S41 and wake with mode and position and error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/10 13:15
S45	2	"20090009387"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/10 16:37
S46	1	S45 and neural adj network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/10 16:37
S47	2	"20090009387"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/10 16:51
S48	430	342/357.74.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/10 16:59

S49	30	S48 and powe$4 and position and error and prediction	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/10 17:00

EAST Search History (Interference)

< This search history is empty>

1/11/2011 2:01:44 PM
C:\Documents and Settings\NNguyen7\My Documents\EAST\Workspaces\11661707-Self Monitoring GPS on Mobile Device.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11661707	MALANEY, ROBERT ANDERSON
	Examiner	Art Unit
	NGA X NGUYEN	3662

SEARCHED			
Class	Subclass	Date	Examiner
342	357.01-357.17	5/4, 7/2010	NXN
455	343.1-343.6	5/7/2010	NXN
342	357.2-357.78	01/07-11/2011	NXN
455	343.1-343.5	01/11/2011	NXN

SEARCH NOTES		
Search Notes	Date	Examiner
TEXT SEARCH	5/4,7/2010	NXN
PLUS SEARCH	5/7/2010	NXN
TEXT SEARCH	01/07-11/2011	NXN

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11661707	MALANEY, ROBERT ANDERSON
	Examiner	Art Unit
	NGA X NGUYEN	3662

✓	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	05/07/2010	01/11/2011							
	1	✓	✓							
	2	✓	✓							
	3	✓	✓							
	4	✓	✓							
	5	✓	✓							
	6	✓	✓							
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	34	✓	=							
	35	✓	=							
	36	✓	=							

Practitioner's Docket No. U 016731-5 ***PATENT***

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Robert Anderson MALANEY
Application No.: 11/661,707 Group No.: 3662
Filed: February 11, 2008 Examiner: N. Nguyen
For: SELF MONITORING GPS ON MOBILE DEVICE

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

REQUEST FOR CONTINUED EXAMINATION (RCE) (37 C.F.R. 1.114)

1. Applicant hereby requests continued examination, in accordance with 37 C.F.R. Section 1.114, for the above identified application.

CERTIFICATION UNDER 37 C.F.R. 1.8(a) and 1.10*
*(When using Express Mail, the Express Mail label number is **mandatory**; Express Mail certification is optional.)*

I hereby certify that, on the date shown below, this correspondence is being:

MAILING

☐ deposited with the United States Postal Service in an envelope addressed to the Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.

37 C.F.R. 1.8(a)

☐ with sufficient postage as first class mail.

37 C.F.R. 1.10*

☐ as "Express Mail Post Office to Address" Mailing Label No. _____ (**mandatory**)

TRANSMISSION

☐ transmitted by facsimile to the Patent and Trademark Office. to **(571)-273-8300**

EFS-WEB

☒ transmitted electronically

Date: April 20, 2011

/Raymond A. DiPerna/
Signature

Raymond A. DiPerna
(*type or print name of person certifying*)

• Only the date of filing (§ 1.6) will be the date used in a patent term adjustment calculation, although the date on any certificate of mailing or transmission under § 1.8 continues to be taken into account in determining timeliness. See § 1.703(f). Consider "Express Mail Post Office to Addressee" (§ 1.10) or facsimile transmission (§ 1.6(d)) for the reply to be accorded the earliest possible filing date for patent term adjustment calculations.

NOTE 1: ***37 C.F.R. § 1.114 Request for continued examination:***

"(a) If prosecution in an application is closed, an applicant may request continued examination of the application by filing a submission and the fee set forth in § 1.17(e) prior to the earliest of:

(1 Payment of the issue fee, unless a petition under § 1.313 is granted;

(2) Abandonment of the application; or

(3) The filing of a notice of appeal to the U.S. Court of Appeals for the Federal Circuit under 35 U.S.C. 141, or the commencement of a civil action under 35 U.S.C. 145 or 146, unless the appeal or civil action is terminated.

(b) Prosecution in an application is closed as used in this section means that the application is under appeal, or that the last Office action is a final action (§ 1.113), a notice of allowance (§ 1.311), or an action that otherwise closes prosecution in the application.

(c) A submission as used in this section includes, but is not limited to, an information disclosure statement, an amendment to the written description, claims, or drawings, new arguments, or new evidence in support of patentability. If reply to an Office action under 35 U.S.C. 132 is outstanding, the submission must meet the reply requirements of § 1.111.

(d) If an applicant timely files a submission and fee set forth in § 1.17(e), the Office will withdraw the finality of any Office action and the submission will br entered and considered. If an applicant files a request for continued examination under this section after appeal, but prior to a decision on the appeal, it will be treated as a request to withdraw the appeal and to reopen prosecution f the application before the examiner. An appeal brief under § 1.192 or a reply brief under § 1.193(b), or related papers, will not be considered a submission under this section."

NOTE 2: *An applicant may file a submission under 37 C.F.R. 1.114 containing only an information disclosure statement (37 C.F.R. 1.97 and 1.98) in an application subject to a notice of allowance under 35 U.S.C. § 151. An appeal brief or a reply brief (or related papers) will not be considered a submission under 37 C.F.R. 1.114. See 37 C.F.R. 1.114(d). The submission, however, may consist of the arguments in a previously filed appeal brief or reply brief, or may simply consist of a statement that incorporates by reference the arguments in a previously filed appeal brief or reply brief. In addition, a previously filed amendment after final may satisfy this submission requirement. American inventor's Protection act of 1999, Question & Answer A5, MPEP 706.07(h)II.*

NOTE 3: *Even though an RCE is improper (e.g., because it was filed before the prosecution is closed), an amendment submitted with the RCE will still be entered and considered by the examiner since it was timely filed and responsive to the non-final Office action in compliance with 37 C.F.R. 1.111. American Inventor's Protection Act of 1999, Question & Answer A4.*

WARNING: *35 U.S.C. 132(b) and Section 1.114 provide for the continued examination of an application and* ***not*** *examination of a continuing application). Accordingly, the Office will not permit an applicant to obtain continued examination on the basis of claims that are independent and distinct from the claims previously claimed and examined. Notice of March 10, 2000, 65 Fed Reg 14865, at 14868.*

WARNING: *The provisions of 37 C.F.R. 1.114 also do not apply (1) to a provisional application; (2) an application for a utility or plant patent filed under 35 U.S.C. 111(a) before June 8, 1995; (3)) an international application filed under 35 U.S.C. 363 before June 8, 1995 (4) a patent under reexamination or (5) an application for a design patent. 37 C.F.R. § 1.114(e).*

WARNING: *The PTO has pointed out why § 1.97(b) does not provide that an information disclosure statement will be considered if it is filed within three months after the date of a request for continued examination under § 1.114. The PTO explained that since an RCE filing is a reply under 35 U.S.C. 132, the applicant may be entitled to patent term adjustment if the Office does not act on an application containing a request for continued examination under § 1.114 within four months. See 35 U.S.C. 154(b)(1)(A)(ii). Thus, the Office cannot delay action on RCE applications for three months to determine whether an information disclosure statement will be filed. The Office, however, is adopting provisions (§ 1.103(c)) for a limited suspension of action after the filing of a request for continued examination under § 1.114, for the applicant to obtain additional time (prior to the issuance of the next Office action) to provide an information disclosure statement (or amendments, or an affidavit or declaration) after the filing of the RCE. See Notice of August 16, 2000, "Request for Continued Examination Practice and Changes to Provisional Application Practice; Final Rule", 65 Fed. Reg., pages 50091-50105, at page 50100 (comment 11); OG: September 5, 2000, pages 13-24.*

WARNING: *One of the time periods excluded from patent term adjustment is the time consumed by a continued examination request under 35 U.S.C. 132(b) (§ 1.114(b)(1)).*

WARNING: *The Office will not suspend action in an application when a reply by the applicant is outstanding. 35 U.S.C. 133 requires an applicant to "prosecute the application" within six months of an Office action (or a shorter period as set in the Office action) to avoid abandonment of the application. If an applicant files a request for continued examination but does not also provide any submission (in reply to the prior Office action) within the period for reply to the prior Office action, the application is abandoned by operation of law (35 U.S.C. 133).*

The Office will treat a request for continued examination under § 1.114 containing a bona fide submission that is not fully responsive to the prior Office action under the practice set forth in § 1.135(c). In addition, under the limited suspension of action provisions of § 1.103(c), an applicant must still file a request for continued examination practice in compliance with § 1.114, but may obtain additional time (prior to the issuance of the next Office action) to provide an information disclosure statement, amendments, or an affidavit or declaration after the filing of the request for continued examination.

See Notice of August 16, 2000. "Request for Continued Examination Practice and Changes to Provisional Application Practice; Final Rule", 65 Fed. Reg., pages 50091-50105, at page 50102 (comment 20); OG: September 5, 29000, ages 13-24, Page 50102.

WARNING: *Section 197(b) does not provide that an information disclosure statement will be considered if it is filed within three months after the date of request for continued examination under § 1.114.*

NOTE: There is no limit to the number of times the fee for continued examination may be submitted. Notice of March 10, 2000, 65 Fed. Reg. 14865. at 14868.

NOTE: Unlike a continuation application, a continued examination request ***can*** *utilize the mailing procedure of 37 C.F.R. 1.8. See 37 C.F.R. Section 1.8(a)(2)(i)(A).*

TIME REQUEST IS BEING MADE

2. This request is being submitted *(check appropriate item(s) below)*:

i. ☒ Prior to abandonment of the application

ii. ☒ Payment of the issue fee

- ☒ Prior to payment of issue fee
- ☐ Issue fee has been paid but a petition under Section 1.313 has been granted

iii. ☐ Prior to a decision on appeal to the Board of Patent Appeals & Interferences

- ☐ A notice is being separately sent to the Board of Patent Appeals & Interferences that this Request for Continued Examination is being filed.

NOTE: If such a notice is not sent to the Board, they may refuse to vacate a decision rendered after the filing of the RCE but before recognition by the Office of the RCE request under Section 1.114.

iv. ☐ After decision on appeal but prior to appeal to the U.S. Court of Appeals of the Federal Circuit under 35 U.S.C. 145 or Commencement of a civil action under 35 U.S.C. 146 and submission amends all rejected claims or shows facts (MPEP 706.07(h) (XI)(A)).

- ☐ Prior to the filing of such appeal or commencement of civil action
- ☐ Such appeal or commencement of civil action has been terminated

ENCLOSURES

3. Do not automatically enter any prior unentered amendment(s) if herewith **as the required submission** is/are:

☐ Request hereby to enter unentered amendment(s) of _____.

☒ An Amendment After Final Rejection

☐ New arguments

☐ New evidence in support of patentability

WARNING: *If reply to a final or non-final Office action under 35 U.S.C. 132 is outstanding, the submission must meet the reply requirements of Section 1.111. 37 C.F.R. Section 1.114(b).*

☐ An information disclosure statement (37 C.F.R. Section 1.98)
(see also Note 2, page 2)

☐ Form PTO-1449 (PTO/SB/08A and 08B)

☐ Other:

FEE FOR REQUEST (37 C.F.R. Section 1.17(e)).

4. This application is on behalf of:

☒	Small entity (and status is still as small entity)	$ 405.00
☐	Other than a small entity	$ 810.00
	Continued Prosecution Request Fee	$ 405.00

FEE FOR CLAIMS

NOTE: *"The fee for continued examination under Section 1.114 (Section 1.17(e)) does not include additional claim fees (cf. 1.53 (d)(3)(ii))." See Notice of March 10, 2000, 65 Fed Reg 14865, at 14868.*

37 CFR 1.53(d((3): "The filing fee for a continued prosecution application filed under this paragraph is:

(i) The basic filing fee as set forth in § 1.16; and

Any additional § 1.16 fee due based on the number of claims remaining in the application afer entry of any amendment accompanying the request for an application under this paragraph and entry of any amendments under § 1.116 unentered in the prior application which applicant has requested to be entered in the continued prosecution application."

5. The fee for claims (37 C.F.R. Section 1.16(b)-(d)) has been calculated as shown below:

	(Col.1)		(Col. 2)	(Col. 3)	SMALL ENTITY			OTHER THAN A SMALL ENTITY	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra	Rate	Addit. Fee	*OR*	Rate	Addit. Fee
Total	*	Minus	**	=	x $26=	$		x $52 =	$
Indep.	*	Minus	***	=	x $110=	$		x $220=	$
☐ First Presentation of Multiple Dependent Claim					+ $195 =	$		+ $390 =	$
					Total Addit. Fee	$___	*OR*	**Total Addit. Fee**	$___

* If the entry in Col. 1 is less than the entry in Col. 2, write "0" in Col. 3,
** If the "Highest No. Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest No. Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest No. Previously Paid For" (Total or Indep.) is the highest number found in the appropriate box in Col. 1 of a prior amendment or the number of claims originally filed.

WARNING: *See 37 C.F.R. Section 1.116.*

EXTENSION OF TIME

(If an extension of time is appropriate complete (a) or (b), as applicable)

6. The proceedings herein are for a patent application, and the provisions of 37 C.F.R. Section 1.136(a) apply.

(a) ☐ Applicant petitions for an extension of time, the fees for which are set out in 37 C.F.R. Section 1.17(a)(1)-(4), for the total number of months checked below:

	Extension (months)	Fee for other than small entity	Fee for small entity
☐	one month	$ 130.00	$ 65.00
☐	two months	$ 490.00	$ 245.00
☐	three months	$ 1,110.00	$ 555.00
☐	four months	$ 1,730.00	$ 865.00

NOTE: As the two-month period set in § 1.192(a) for filing an appeal brief is not subject to the six-months maximum period specified in 35 U. S .C § 133, the period for filing an appeal brief may be extended up to seven months. 62 Fed. Reg.. 53,131, at 53,156; 1203 O.G. 63, at 84 (Oct. 10, 1997).

☐	five months	$ 2,350.00	$ 1,175.00

Fee $ _____

If an additional extension of time is required, please consider this a petition therefor.

(check and complete the next item, if applicable)

☐ An extension for _____ months has already been secured, and the fee paid therefor of $ _____ is deducted from the total fee due for the total months of extension now requested.

Extension fee due with this request $ _____

OR

(b) ☒ Applicant believes that no extension of time is required. However, this is a conditional petition and authorization to pay the necessary fees to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

TOTAL FEE(S) DUE

WARNING: *The fee for continued examination under Section 1.114 may not be deferred. 37 C.F.R. Section 1.53(f).*

7. The total fee(s) due is/are:

Continued Prosecution Fee (Section 1.17(e))	$ 405.00
Fee(s) for additional claims (if any) (Section 1.16(b)-(d))	$ _____
Extension of time fee (if any) (Section 1.17(a)(1)-(4))	$ _____
Total Fee(s) Due:	$ 405.00

PAYMENT OF FEE(S) DUE

8. Please pay the fee(s) for this continued examination application as follows:

☐	Check is attached for the sum of	$ _____
☒	Charge Account 12-0425 the sum of	$ 405.00

Please charge any required additional fee(s) for Section 1.17(e), Section 1.16(b)-(d) and/or Section 1.17(a)(1)-(4) or refund overpayment to

☒ Deposit Account 12-0425

INVENTORSHIP

NOTE: Any change of inventors must be via the procedure set forth in 37 C.F.R. Section 1.48. See Notice of March 10, 2000, 65 Fed Reg 14865, at 14868.

9. This application as amended names as inventors:

☐ the same inventors as previously designated for the claims.

☐ fewer than the inventors previously designated and a statement accompanies this request for the deletion of the name or names of the person or persons who are not inventors of the invention now being claimed.

☐ a person not named previously as an inventor and a petition under 37 C.F.R. Section 1.48 is/has separately:

- ☐ being filed
- ☐ been filed

DEFERRAL OF EXAMINATION

10. ☐ A Request for Suspension of examination accompanies this request for continued examination. *(See, 9-68 or Petition for Suspension)*

/Raymond A. DiPerna/

Reg. No.:

SIGNATURE OF PRACTITIONER

Raymond A. DiPerna, 44063, (212) 708-1950

Tel. No.: ( )

(type or print name of practitioner)

Customer No.:

00140

PATENT TRADEMARK OFFICE

P.O. Address

c/o Ladas & Parry LLP
1040 Avenue of the Americas
New York, N. Y. 10018-3738

Practitioner's Docket No. U 016731-5 ***PATENT***

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Robert Anderson MALANEY
Serial No.: 11/661,707 Group No.: 3662
Filed: February 11, 2008 Examiner: N. Nguyen
For: SELF MONITORING GPS ON MOBILE DEVICE

RESPONSE UNDER 37 C.F.R. 1.116 EXPEDITED PROCEDURE EXAMINING GROUP 3662

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

AMENDMENT AFTER FINAL REJECTION

In response to the final action of January 20, 2011, please amend the above application as follows, and consider the Remarks presented herein.

CERTIFICATION UNDER 37 C.F.R. 1.8(a) and 1.10*
*(When using Express Mail, the Express Mail label number is **mandatory**; Express Mail certification is optional.)*

I hereby certify that, on the date shown below, this correspondence is being:

MAILING

☐ deposited with the United States Postal Service in an envelope addressed to the Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.

37 C.F.R. 1.8(a)

☐ with sufficient postage as first class mail.

37 C.F.R. 1.10*

☐ as "Express Mail Post Office to Address" Mailing Label No. _____ (**mandatory**)

TRANSMISSION

☐ transmitted by facsimile to the Patent and Trademark Office. to **(571)-273-8300**

EFS-WEB

☒ transmitted electronically

Date: April 20, 2011

/Raymond A. DiPerna/
Signature

Raymond A. DiPerna
(*type or print name of person certifying*)

IN THE CLAIMS

The following is a complete listing of the claims, and replaces all earlier versions and listings.

1. (currently amended) A method of acquiring GPS on a mobile wireless communication device for a wireless communications network, said mobile device possessing ~~GPS capability and~~ wireless communications capability for said wireless network and an embedded GPS module for GPS capability, said method comprising ~~the step of~~:

setting a current value of a period of a power-up phase of said GPS dependent on a current radio position and error of said mobile device in the wireless network determined from the wireless network and adaptive predictions of when said GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

2. (previously presented) The method according to claim 1, wherein the current radio position and error are determined using Cramer-Rao Bounds.

3. (previously presented) The method according to claim 1, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable statistical bounds.

4. (previously presented) The method according to claim 1, wherein said mobile device determines dynamically an optimal period of the power-up phase.

5. (previously presented) The method according to claim 1, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

6. (previously presented) The method according to claim 5, wherein said adaptive-filter and machine learning techniques are implemented using said mobile device.

7. (currently amended) The method according to claim 1, ~~wherein said setting step comprises~~ further comprising:

if at least one of ~~predicted accuracy~~ said position error and ~~predicted~~ acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

if at least one of ~~predicted accuracy~~ said position error and ~~predicted~~ acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

8. (previously presented) The method according to claim 1, wherein said mobile device comprises a power limited device.

9. (currently amended) The method according to claim 1, wherein said ~~mobile device~~ embedded GPS module comprises an embedded GPS device.

10. (previously presented) The method according to claim 1, further comprising the step of making adaptive predictions using a neural network.

11. (currently amended) The method according to claim 1, wherein said setting step comprises:

predicting a next position at a next scheduled power-up time using a number of last positions reported of said mobile device in the wireless network determined from the wireless network;

comparing said predicted position at said next power-up time with an actual position of said mobile device in the wireless network determined from the wireless network and determining [[a]] said position error; and

storing current values of said period of the power-up phase, acquisition time, said position error, and position in a storage unit of said mobile device.

12. (currently amended) A mobile wireless communication device for a wireless communications network, said mobile device possessing wireless communications capability for said wireless network, comprising:

a processor;

a memory coupled to said processor;

[[a]] an embedded GPS module coupled to said processor providing a GPS capability for said mobile device; and

means for setting a current value of a period of a power-up phase of said GPS dependent on the current radio position and error of said mobile device in the wireless network determined from the wireless network and adaptive predictions of when said GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

13. (currently amended) The mobile device according to claim 12, wherein the current radio position and error are determined using Cramer-Rao Bounds.

14. (previously presented) The mobile device according to claim 12, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable statistical bounds.

15. (previously presented) The mobile device according to claim 12, wherein said mobile device determines dynamically an optimal period of the power-up phase.

16. (previously presented) The mobile device according to claim 12, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

17. (previously presented) The mobile device according to claim 16, wherein said adaptive-filter and machine-learning techniques are implemented using said mobile device.

18. (currently amended) The mobile device according to claim 12, ~~wherein said setting means comprises~~ further comprising:

means for, if at least one of predicted accuracy error and predicted acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

means for, if at least one of predicted accuracy error and predicted acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

19. (previously presented)The mobile device according to claim 12, wherein said mobile device comprises a power limited device.

20. (previously presented)The mobile device according to claim 19, further comprising a battery for powering said mobile device.

21.(previously presented) The mobile device according to claim 12, further comprising a neural network module for making adaptive predictions.

22. (currently amended) The mobile device according to claim 12, wherein said setting means comprises:

means for predicting a next position at a next scheduled power-up time using a number of last positions reported;

means for comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

means for storing current values of a period of the power-up phase, acquisition time, said position error, and position in a storage unit of said mobile device.

23. (currently amended) A computer program product for a mobile wireless communication device for a wireless communication network, said mobile device possessing ~~GPS capability and~~ wireless communications capability for said wireless network and an embedded GPS module for GPS capability, said computer program product having a computer readable medium storing a computer program for acquiring GPS on said mobile device, comprising:

computer program code means for interfacing with the GPS capability of said mobile

device; and

computer program code means for setting a current value of the period of the power-up phase of said GPS dependent on a current radio position and error of said mobile device in the wireless network determined from the wireless network and adaptive predictions of when said GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

24. (previously presented) The computer program product according to claim 23, wherein the current radio position and error are determined using Cramer-Rao Bounds.

25. (previously presented) The computer program product according to claim 23, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable statistical bounds.

26. (previously presented) The computer program product according to claim 23, wherein said computer program product determines dynamically an optimal period of the power-up phase.

27. (previously presented) The computer program product according to claim 23, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

28. (previously presented) The computer program product according to claim 27, wherein said adaptive-filter and machine-learning techniques are implemented using said mobile device.

29. (currently amended) The computer program product according to claim 23, ~~wherein said computer program code means for setting comprises~~ further comprising:

computer program code means for, if at least one of ~~predicted accuracy~~ said position error and ~~predicted~~ acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

computer program code means for, if at least one of ~~predicted accuracy~~ said position error and ~~predicted~~ acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

30. (previously presented) The computer program product according to claim 23, wherein said mobile device comprises a power limited device.

31. (previously presented) The computer program product according to claim 30, wherein said mobile device comprises a battery for powering said mobile device.

32. (previously presented) The computer program product according to claim 23, further comprising computer program code means for providing a neural network module to make adaptive predictions.

33. (currently amended) The computer program product according to claim 23, wherein said computer program code means for setting comprises:

computer program code means for predicting at a next position a next scheduled power-up time using a number of last positions reported;

computer program code means for comparing said predicted position at said next power-up time with an actual position of said mobile device and determining a position error; and

computer program code means for storing current values of a period of the power-up phase, acquisition time, said position error, and position in a storage unit of said mobile device.

34. (currently amended) A method of acquiring GPS on a mobile device for a wireless network, said mobile device possessing ~~GPS capability and~~ wireless communications capability for said wireless network and GPS capability, said method comprising the steps of:

using a position error of said mobile device in the wireless network determined from the wireless network;

if the position error is too large, adjusting a current value of a period of a power-up phase of said GPS downward;

if the position error is too small, adjusting the current value of said period of the power-up phase of said GPS upward;

estimating using a neural network a new value of said period of the power-up phase of said GPS dependent upon said position error; and

setting a new value of said period of the power-up phase of said GPS to a weighted value dependent upon an acceptable error bound.

35. (currently amended) A method of acquiring GPS on a mobile device for a wireless network, said mobile device possessing ~~GPS capability and~~ wireless communications capability for said wireless network and GPS capability, said method comprising the steps of:

using an acquisition time at a last position fix of the mobile device in the wireless network determined from the wireless network;

if the acquisition time is too large, adjusting a current value of a period of a power-up phase of said GPS downward;

if the acquisition time is too small, adjusting the current value of said period of the power-up phase of said GPS upward;

estimating using a neural network a new value of said period of the power-up phase of said GPS dependent upon said acquisition time; and

setting a new value of said period of the power-up phase of said GPS to a weighted value dependent upon an acceptable bound.

36. (previously presented) The method according to claim 34, wherein the position error is the Cramer-Rao Bound on the radio position of the mobile device.

37. - 40. (canceled)

REMARKS

Introduction and status of claims

Claims 1-36 are pending in this application.

The front page of the Office Action mailed 20 January 2011 indicates claims 1-33 are rejected and claims 34-36 are objected to. While Applicant appreciates the indication of allowability set forth by the Examiner, Applicant believes that the objection to claim 34-36 is incorrectly indicated and in fact those claims are in condition for allowance (claims 34 and 35 being independent) as stated in section 2 (Allowable Subject Matter) of the Office Action.

Claims 1, 7, 9, 11, 12, 18, 22, 23, 29, and 33-35 have been amended to define more clearly what Applicant regards as his invention.

Support for the claim amendments is discussed in the Appendix to this Response.

Claims 1, 12, 23, 34 and 35 are independent form.

Applicant has the following comments in particular. Responses are made in order of the list of sections in the Office Action, for ease of reference.

Claim Rejections - 35 USC §102(b)

Claims 1-33 are rejected under 35 USC 102(b) as being anticipated by Lau et al (US5592173).

GPS Receiver of Lau et al

Lau et al is directed to a GPS receiver having a low power standby mode, seeking to reduce power consumption in the GPS receiver (see col. 1, lines 1-9). In the standby mode, GPS satellite signals are not acquired, tracked, or displayed (see col. 4, lines 32-34; col. 6,

lines 1-3). A real time clock (RTC) issues a wakeup interrupt signal to initiate normal mode when a cycle count equals an RTC count number provided by a microprocessor system 40 (see col. 7, lines 1-12). The RTC count number is calculated from a standby mode time duration (see col. 7, lines 5-8). In the lower power standby mode, one or more of the components of the GPS receiver have power inhibited: a GPS antenna, a GPS frequency downconverter, one or more output devices, one or more input devices, and one or more optional dead reckoning devices (see col. 7, lines 15-22). The procedure of exiting normal mode and entering standby mode is illustrated in Fig. 4 of Lau et al. The selection means including pre-coded software stored in memory in a microprocessor system selects a time duration for standby mode using:

- information of an intended user application of the GPS receiver;
- variables measured by the GPS receiver; and
- variables received from user input device (see col. 9, lines 18-23).

To prevent rapidly increasing location error, the standby mode duration is dependent on the intended user application. A short time is required for exampled in an aviation application (see col. 9, lines 32-37), a longer time duration might be selected for vehicle use, and an even longer duration might be selected for pedestrian use (see col. 9, lines 37-43). One of the measured GPS variables is rate of change of location (see col. 9, lines 44-45), and another is GPS satellite visibility (see col. 9, lines 52-53). Still other GPS measured variables are signal consistency (see col. 9, lines 65-66) and col. 10, lines 6-7). The user may use the input devices to request a length of duration for standby mode, where the duration may be specified using words or an application such as air, land, sea (see col. 10, lines 12-17). The user may request a specific length of time duration using time units, or a location fix frequency (see col. 10, lines 20-24). "All of the intended user applications, the measured

variables, and the user entered variables are considered in the selection means 42 to select the standby mode time duration" (see col. 10, lines 25-27). The RTC time duration is set before power and a system clock are inhibited in steps 134, 136, 137 and the microprocessor clock is inhibited in step 138 (see col. 10, lines 47-61) to enter the standby mode.

Normal mode is initiated upon receipt of a wakeup interrupt signal in step 146 (see col. 11, lines 3-4). The wakeup interrupt signal is generated by: the RTC typically (see col. 11, lines 4-6), the input device at a request from a user, e.g. by a key switch (see col. 11, lines 6-15, or a selected limit within a dead reckoning device is exceeded (see col. 11, lines 16-18). Dead reckoning devices that are disclosed include: barometer, altimeter, odometer, or a marine log (see col. 11, lines 32-35). The processor wakeup enables the system clock and microprocessor clock in step 148 and then normal mode is entered, which pass power to components of the GPS receiver that are power inhibited. GPS satellite signals are acquired and a location is calculated (see col. 12, lines 3-5).

Wireless Device & Wireless Network

The subject matter of amended independent claim 1 relates to a "wireless communications device" that communicates with "a wireless communication network" and that has "an embedded GPS module". These limitations are specifically recited in amended claim 1.

In relation to the claimed invention, mobile device means "a power limited (e.g., battery operated device possessing embedded GPS capability. Examples of such devices are GPS-capable mobile telephones, laptop computers, Personal Digital Assistants (PDAs), and wireless sensor devices, to name a few": see paragraph [0032]. That the mobile wireless communications device is different to a GPS receiver is indicated at paragraph [0052]: "For additional power savings, the neural network calculations may be passed to some external

processing unit within the network, if the mobile device is in communication with a larger network, e.g. a wireless network. The value of the power-up period calculated by the external device may then be passed back to the mobile device." Also see paragraph [0055]: "The methods according to the embodiments of the invention may be practiced using one or more general-purpose computer systems, handheld devices, cellular phone, and other suitable mobile computing devices, in which the processes described with reference to FIGS. 1-5 may be implemented as software, such as an application program executing within the computer system or a handheld device." Also, see the description of the computer system of Fig. 6 described at paragraph [0056]: "The computer system 600 can be connected to one or more other computers via a communication interface 664 using an appropriate communication channel 640. The computer network 620 may comprise a wireless local area network (WLAN), or a 3G network, for example. While not depicted in FIG. 6 to simplify the drawing, it will be readily appreciated by those skilled in the art that the computer system 600 may be equipped with a GPS module, for example, in the manner shown in FIG. 1."

Lau et al discloses a GPS receiver only and is entirely silent about a different wireless communications device that communicates with a wireless communication network (that is, independent of the GPS satellites referred to in Lau et al.) Furthermore, the wireless communications device has an embedded GPS module, which amplifies this point of distinction. It is submitted that the GPS receiver of Lau et al is not a mobile wireless communications device as recited in amended claim 1.

Position Information Determined by Wireless Network

Amended independent claim 1 recites that a current value of a period of a power-up phase of the GPS that is set dependent on a current radio position and error of the mobile device in

the wireless network determined from the wireless network. Fig. 2 of the present application illustrates a system for adaptively predicting when a GPS-enabled wireless communication device should be powered on: see paragraph [0016] and [0035]. The system 200 of Fig. 2 may be implemented using the PDA 100 of FIG. 1. The system 200 has a number of inputs including last satellite positions 210, a last GPS position/time 212, and a last GPS error 214. However, as shown in Fig. 2, the foregoing inputs are plainly different to the current radio position and error (Cramer-Rao Bound) that is input. This is the current radio position and error of the mobile device in the wireless network determined from the wireless network.

Lau et al only teaches use of position error determined from a GPS system. Lau et al does not disclose use of position information determined by the wireless communications network to control the GPS power supply. Still further, Lau et al does not disclose the more specific use of position error as determined by the wireless communications network. The source of location information in the claimed invention is distinct from and independent of the GPS position and error referred to in Lau et al.

Further evidence in support of the fact that the term "radio position and error" is not taken in the claimed invention to mean the position and error as derived from GPS can be seen from Fig. 2 of the instant application and the specification at paragraph [0030] states "... when a GPS device, embedded in a wireless communication device, should be powered on to meet specifications on positioning accuracy ..." Clearly, the claimed invention is deciding when the embedded GPS should be powered on. Since the embedded GPS is therefore off at the time of decision making, there can be no current GPS position or error, but only a "Last GPS Position" (212) and a "Last GPS Error" (214): see Fig. 2. These are distinct inputs to the "Current Radio Position and Error" (220), as shown in Fig. 2. Since GPS is off and the mobile device with embedded GPS communicates with a wireless network, the term "radio

position" in amended claim 1 refers to the radio position as determined from the wireless network. In the claimed invention, the "radio position" and a "GPS position" are two quite different and independent sources of information on the position of a mobile device. Indeed, in the claimed invention it is entirely possible that the GPS system is never used. That is, the embedded GPS system of the mobile device in the claimed invention might never switch on (power up) its embedded GPS. This is because the "radio position and error" of the claimed invention informs the system that the position accuracy as determined from the wireless network is such that the accuracy of position is acceptable and therefore GPS need not be powered on. This ability represents potentially very large energy savings compared to the system of Lau, which always needs to power on GPS to determine a position.

Method Claims 1-11 Allowable

In light of the foregoing, Applicant submits that amended independent method claim 1 is neither anticipated nor suggested by the cited reference, Lau et al. Further, dependent claims 2-11 being appended to an allowable base claim are themselves in condition for allowance.

Applicant reiterates comments made in the previous response that Ranta does overcome these shortcomings of Lau et al., even if those two references were to be considered in combination (and even assuming such combination would be permissible).

The Office Action at page 2, last paragraph states: "... variance of biased (see column 10 lines 25-43)". The Applicant is uncertain as to the intended remark being made here and requests clarification if the rejection is maintained. In any event, it is submitted that claim 2 being a dependent claim of an allowable base claim is in condition for allowance.

Device Claims 12-22 Allowable

Independent device claim 12 corresponds to independent method claim 1. Therefore, for the reasons explained above with respect to claim 1, Applicant submits that amended independent claim 12 is neither anticipated nor suggested by the cited reference, Lau et al. Further, dependent claims 13-22 being appended to an allowable base claim are themselves in condition for allowance.

The Office Action at page 2, last paragraph states: "... variance of biased (see column 10 lines 25-43)". The Applicant is uncertain as to the intended remark being made here and requests clarification if the rejection is maintained. In any event, it is submitted that claim 13 being a dependent claim of an allowable base claim is in condition for allowance.

Computer Program Product Claims 23-33 Allowable

Independent computer program product claim 23 corresponds to independent method claim 1. Therefore, for the reasons explained above with respect to claim 1, Applicant submits that amended independent claim 23 is neither anticipated nor suggested by the cited reference, Lau et al. Further, dependent claims 24-33 being appended to an allowable base claim are themselves in condition for allowance.

Allowable Subject Matter

Applicant notes with appreciation the statement in the Office Action that claims 34-36 are allowed. Applicant respectfully submits that the front page of the Office Action mailed 20 January 2011 indicates incorrectly that claims 34-36 are objected to. Application submits that claims 34-36 are in condition for allowance.

Response to Amendment

For at least the foregoing reasons, Applicant submits that claims 1-33 are not anticipated or suggested by the cited reference.

Applicant is submitting herewith a Request for Continued Examination (RCE).

Page 364 of 448 (IPR2023-01374)
Google LLC et al v. Nariste Networks Pty. Ltd.

Appendix

Support for the proposed claim amendments is provided as follows:

Claim	Amendment	Support
1.	Insert "wireless communication" between "mobile" and "device" in preamble	See paragraph [0016]: "wireless communication device". See paragraph [0030]: "wireless communication device".
1.	Insert "communication" between "wireless" and "network" in preamble.	See paragraph [0052]: "For additional power savings, the neural network calculations may be passed to some external processing unit within the network, if the mobile device is in communication with a larger network, e.g. a wireless network." See paragraph [0056]: "The computer network 620 may comprise a wireless local area network (WLAN), or a 3G network, for example. While not depicted in FIG. 6 to simplify the drawing, it will be readily appreciated by those skilled in the art that the computer system 600 may be equipped with a GPS module, for example, in the manner shown in FIG. 1."
1.	Delete "GPS capability and" before "wireless communications capability for said wireless network".	Moving this limitation, see below, to improve claim clarity.
1.	Insert "an embedded GPS module for GPS capability" after "wireless communications capability for said wireless network".	See paragraph [0030]: "... when a GPS device, embedded in a wireless communication device, should be powered on to meet specifications on positioning accuracy …" Support for "GPS module" is provided by original claim 12. Also see paragraph [0011], [0022], and paragraph [0056], last sentence.
1.	Delete "the step of" after "comprising".	

1.	Insert "of said mobile device in the wireless network determined from the wireless network" after "current radio position and error".	This limitation is recited in original claims 1 and 12, as well as claims 23, 34.
7.	Replace "predicted accuracy error" with "said position error".	See original claim 23: "position error". See Figs. 3 and 4. See paragraph [0034], sentence 4 onwards.
7.	Delete "predicted" before " acquisition time"	See original claim 25: "acquisition time". See Fig. 5. See paragraph [0041].
9.	Delete "mobile device" and insert "embedded GPS module".	Amended for antecedency to accord with amended claim 1, which recites a mobile device having an embedded GPS module.
11.	Insert "said" before "position error" in storing step.	Minor grammatical change.
11.	Insert "of said mobile device in the wireless network determined from the wireless network" after "last positions reported".	Amended for antecedency with claim 1.
11.	Insert "in the wireless network determined from the wireless network" after "of said mobile device" in the comparing step.	Amended for antecedency with claim 1.
12.	Amended per claim 1.	See above regarding claim 1.
18.	Amended per claim 7.	See above regarding claim 7.
22.	Amended per claim 11.	See above regarding claim 11.
23.	Amended per claim 1.	See above regarding claim 1.
29.	Amended per claim 7.	See above regarding claim 7.

33.	Amended per claim 11.	See above regarding claim 11.
34.	Delete "GPS capability and" before "wireless communications capability for said wireless network".	See above regarding claim 1.
34.	Insert "and GPS capability" after "wireless communications capability for said wireless network".	See above regarding claim 1.
35.	Amended per claim 34.	See above regarding claim 34.

Conclusion

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration and early passage to issue of the present application.

Respectfully submitted,

/Raymond A. DiPerna/

Raymond A. DiPerna
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Page 367 of 448 (IPR2023-01374)
Google LLC et al v. Nariste Networks Pty. Ltd.

Electronic Patent Application Fee Transmittal	
Application Number:	11661707
Filing Date:	11-Feb-2008
Title of Invention:	Self Monitoring Gps on Mobile Device
First Named Inventor/Applicant Name:	Robert Anderson Malaney
Filer:	Janet I. Cord/Raymond DiPerna
Attorney Docket Number:	U 016731-5
Filed as Small Entity	

U.S. National Stage under 35 USC 371 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($)
Miscellaneous:				
Request for continued examination	2801	1	405	405
		Total in USD ($)		**405**

Electronic Acknowledgement Receipt	
EFS ID:	9924450
Application Number:	11661707
International Application Number:	
Confirmation Number:	9076
Title of Invention:	Self Monitoring Gps on Mobile Device
First Named Inventor/Applicant Name:	Robert Anderson Malaney
Customer Number:	00140
Filer:	Janet I. Cord/Raymond DiPerna
Filer Authorized By:	Janet I. Cord
Attorney Docket Number:	U 016731-5
Receipt Date:	20-APR-2011
Filing Date:	11-FEB-2008
Time Stamp:	19:41:37
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$405
RAM confirmation Number	8424
Deposit Account	120425
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Request for Continued Examination (RCE)	U0167315RCE04202011.pdf	66512 789ae3387c51c4e76ce9bb4208caf51d83c3ac39	no	7
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
2		U0167315AAF04202011.pdf	77812 076c01fa0f7b4daae22343f4d4c228dc2a4add6f	yes	21
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment After Final		1	1	
	Claims		2	10	
	Applicant Arguments/Remarks Made in an Amendment		11	21	
Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	30216 40cbcaafa103097b9d5ea3548083d91872bcee11	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	174540		

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.

Practitioner's Docket No. U 016731-5 ***PATENT***

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Robert Anderson MALANEY
Serial No.: 11/661,707 Group No.: 3662
Filed: February 11, 2008 Examiner: N. Nguyen
For: SELF MONITORING GPS ON MOBILE DEVICE

RESPONSE UNDER 37 C.F.R. 1.116 EXPEDITED PROCEDURE EXAMINING GROUP 3662

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

REQUEST FOR INTERVIEW

Submitted herewith is a Request for Continued Examination (RCE), as well as an Amendment After Final Rejection. While the Amendment After Final Rejection is believed clearly to place this application in condition for allowance, should the Examiner nevertheless believe that issues remain outstanding, the Examiner is respectfully requested to contact Applicant's undersigned attorney in an effort to resolve such issues and advance the case to issue.

CERTIFICATION UNDER 37 C.F.R. 1.8(a) and 1.10*
*(When using Express Mail, the Express Mail label number is **mandatory**; Express Mail certification is optional.)*

I hereby certify that, on the date shown below, this correspondence is being:

MAILING

☐ deposited with the United States Postal Service in an envelope addressed to the Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.

37 C.F.R. 1.8(a)

☐ with sufficient postage as first class mail.

37 C.F.R. 1.10*

☐ as "Express Mail Post Office to Address" Mailing Label No. _____ **(mandatory)**

TRANSMISSION

☐ transmitted by facsimile to the Patent and Trademark Office. to **(571)-273-8300**

EFS-WEB

☒ transmitted electronically

Date: April 20, 2011

/Raymond A. DiPerna/
Signature

Raymond A. DiPerna
(type or print name of person certifying)

(Request for Interview—First Page) **9-20.1**

In that regard, this paper should be considered a formal, written request for an interview.

Respectfully submitted,

/Raymond A. DiPerna/

Raymond A. DiPerna
c/o Ladas & Parry LLP
1040 Avenue of the Americas
New York, New York 10018-3738
Reg. No. 44063
Tel. No. (212) 708-1950

Electronic Acknowledgement Receipt	
EFS ID:	9925009
Application Number:	11661707
International Application Number:	
Confirmation Number:	9076
Title of Invention:	Self Monitoring Gps on Mobile Device
First Named Inventor/Applicant Name:	Robert Anderson Malaney
Customer Number:	00140
Filer:	Janet I. Cord/Raymond DiPerna
Filer Authorized By:	Janet I. Cord
Attorney Docket Number:	U 016731-5
Receipt Date:	20-APR-2011
Filing Date:	11-FEB-2008
Time Stamp:	22:43:40
Application Type:	U.S. National Stage under 35 USC 371

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	Applicant summary of interview with examiner	U0167315IntReq04202011.pdf	35896 7faf3039e51a5b364ef78ea7b60d32977026c8da	no	2

Warnings:
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Total Files Size (in bytes):	35896

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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.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. 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 11/661,707	Filing Date 02/11/2008	☐ 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 ($)	FEE ($)		RATE ($)	FEE ($)
☒ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	155		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), 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	155		TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
	04/20/2011	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	* 36	Minus	** 36	= 0	X $26 =	0	OR	X $ =	
	Independent (37 CFR 1.16(h))	* 5	Minus	***9	= 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	

		(Column 1)		(Column 2)	(Column 3)					
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	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:
/GWENDOLYN MYERS/

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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Robert Anderson MALANEY

Serial No.: 11/661,707 Group No. 3662

Filed: February 11, 2008 Examiner: N. Nguyen

For: SELF MONITORING GPS ON MOBILE DEVICE

Attorney Docket No.: U 016731-5

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

INFORMATION DISCLOSURE STATEMENT

In compliance with the duty of disclosure under 37 C.F.R. § 1.56 and in accordance with the practice under 37 C.F.R. §§ 1.97 and 1.98, the Examiner's attention is directed to the documents listed on the attached Form PTO-1449.

CERTIFICATION UNDER 37 C.F.R. 1.8(a) and 1.10*
*(When using Express Mail, the Express Mail label number is **mandatory**; Express Mail certification is optional.)*

I hereby certify that, on the date shown below, this correspondence is being:

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37 C.F.R. 1.8(a)

☐ with sufficient postage as first class mail.

37 C.F.R. 1.10*

☐ as "Express Mail Post Office to Address" Mailing Label No. _____ **(mandatory)**

TRANSMISSION

☐ transmitted by facsimile to the Patent and Trademark Office. to **(571)-273-8300**

EFS-WEB

☒ transmitted electronically

Date: April 25, 2011

Signature /aad/

Raymond A. DiPerna
(type or print name of person certifying)

Page 377 of 448 (IPR2023-01374)
Google LLC et al v. Nariste Networks Pty. Ltd.

The listed documents are:

1) a second Office Action dated May 24, 2010 in respect of Chinese corresponding Application No. 200580036782.3 and an English translation thereof; and

2) a third Office Action dated January 19, 2011 in respect of Chinese corresponding Application No. 200580036782.3 and an English translation thereof.

CONCLUSION

It is respectfully requested that the above information be considered by the Examiner and that a copy of the enclosed Form PTO-1449 be returned indicating that such information has been considered.

Respectfully submitted,

Raymond A. DiPerna
c/o Ladas & Parry LLP
26 West 61st Street
New York, New York 10023
Reg. No. 44063
Tel. No. (212) 708-1950

FORM PTO-1449 U. S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)	ATTY. DOCKET NO.	SERIAL NO.
	U 016731-5	**11/661,707**
	APPLICANT	
	Robert Anderson MALANEY	
	FILING DATE	GROUP
	February 11, 2008	**3662**

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	REFERENCE DESIGNATION	DOCUMENT NUMBER	DATE	NAME	FILING DATE IF APPROPRIATE
	AA				
	AB				
	AC				
	AD				
	AE				
	AF				
	AG				
	AH				
	AI				
	AJ				
	AK				

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION	
					YES	NO
	AL					
	AM					
	AN					
	AO					
	AP					

OTHER ART (Including Author, Title, Date, Pertinent Dates, Etc.)

	AQ	a second Office Action dated May 24, 2010 in respect of Chinese corresponding Application No. 200580036782.3 and an English-language version thereof
	AR	a third Office Action dated January 19, 2011 in respect of Chinese corresponding Application No. 200580036782.3 and an English-language version thereof
	AS	

EXAMINER	DATE CONSIDERED
EXAMINER: Initial if citation 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.	

Form PTO-1449 **6-4**

Electronic Acknowledgement Receipt	
EFS ID:	9947574
Application Number:	11661707
International Application Number:	
Confirmation Number:	9076
Title of Invention:	Self Monitoring Gps on Mobile Device
First Named Inventor/Applicant Name:	Robert Anderson Malaney
Customer Number:	00140
Filer:	Janet I. Cord/Olivia Stanford
Filer Authorized By:	Janet I. Cord
Attorney Docket Number:	U 016731-5
Receipt Date:	25-APR-2011
Filing Date:	11-FEB-2008
Time Stamp:	14:44:02
Application Type:	U.S. National Stage under 35 USC 371

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	Information Disclosure Statement (IDS) Filed (SB/08)	0167315ids.pdf	568277 e55779dd5ec7a7ec58165ce7c4fd57c0d80fd4c6	no	11

Warnings:
Information:

This is not an USPTO supplied IDS fillable form	
Total Files Size (in bytes):	568277

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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
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NOTICE OF ALLOWANCE AND FEE(S) DUE

140 7590 06/10/2011

LADAS & PARRY LLP
1040 Avenue of the Americas
NEW YORK, NY 10018-3738

EXAMINER
NGUYEN, NGA X

ART UNIT	PAPER NUMBER
3662	

DATE MAILED: 06/10/2011

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/661,707	02/11/2008	Robert Anderson Malaney	U 016731-5	9076

TITLE OF INVENTION: SELF MONITORING GPS ON MOBILE DEVICE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$755	$300	$0	$1055	09/12/2011

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.

PTOL-85 (Rev. 02/11)

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)

140 7590 06/10/2011

LADAS & PARRY LLP
1040 Avenue of the Americas
NEW YORK, NY 10018-3738

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.

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.
11/661,707	02/11/2008	Robert Anderson Malaney	U 016731-5	9076

TITLE OF INVENTION: SELF MONITORING GPS ON MOBILE DEVICE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$755	$300	$0	$1055	09/12/2011

EXAMINER	ART UNIT	CLASS-SUBCLASS
NGUYEN, NGA X	3662	342-357150

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 _____

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.

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.

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.
11/661,707	02/11/2008	Robert Anderson Malaney	U 016731-5	9076

140 7590 06/10/2011

LADAS & PARRY LLP
1040 Avenue of the Americas
NEW YORK, NY 10018-3738

EXAMINER	
NGUYEN, NGA X	
ART UNIT	PAPER NUMBER
3662	

DATE MAILED: 06/10/2011

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 318 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 318 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.

PTOL-85 (Rev. 02/11)

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)	
	11/661,707	MALANEY, ROBERT ANDERSON	
	Examiner	Art Unit	
	NGA X. NGUYEN	3662	

-- 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 *4/20/2011*.

2. ☒ The allowed claim(s) is/are *1-36*.

3. ☒ 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.

4. ☐ 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.

5. ☐ 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).

6. ☐ 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 4/25/2011
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 _____.

Allowable Subject Matter

1. The following is an examiner's statement of reasons for allowance: The closest prior arts does not teach or make obvious:

- "Setting a current value of a period of power-up phase of said GPS dependent on a current radio position and error …."

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 submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NGA X. NGUYEN whose telephone number is (571)272-5217. The examiner can normally be reached on 8:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, TARCZA H. THOMAS can be reached on (571) 272-6979. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NGA X. NGUYEN
Examiner
Art Unit 3662

NXN

/Thomas H. Tarcza/
Supervisory Patent Examiner, Art Unit 3662

Notice of References Cited	Application/Control No. 11/661,707	Applicant(s)/Patent Under Reexamination MALANEY, ROBERT ANDERSON	
	Examiner NGA X. NGUYEN	Art Unit 3662	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2005/0162306	07-2005	Babitch et al.	342/357.05
*	B	US-6,141,570	10-2000	O'Neill et al.	455/574
	C	US-			
	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
	N					
	O					
	P					
	Q					
	R					
	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.

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11661707	MALANEY, ROBERT ANDERSON
	Examiner	**Art Unit**
	NGA X NGUYEN	3662

ORIGINAL		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
342	357.74	G	0	1	S	19 / 34 (2010.0)						

CROSS REFERENCE(S)					
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				

☒ 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

/NGA X NGUYEN/ Examiner.Art Unit 3662	6/2/2011	**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	36	
/THOMAS TARCZA/ Supervisory Patent Examiner.Art Unit 3662	06/03/2011	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	Fig.4

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
		"20090009387	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/27 11:38
		355/343.1-343.5.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/11 13:05
		342/343.1-343.5.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/11 13:05
L1	43	garin-lionel.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/06/02 12:40
L2	357	342/357.42.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/06/02 13:04
L3	0	2 and wireless adj network with position with error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/06/02 13:04
L4	43	positioning adj system and wireless adj network with position with error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/06/02 13:05

L5	3	4 and gps with (power adj up or power-up or active)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/06/02 13:05
S1	1	("20090009387").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2010/05/04 09:46
S2	12	malaney-R$.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 09:48
S3	6729	342/357.01-357.17.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 10:10
S4	2214	S3 and position with error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 10:13
S5	6	S4 and (power adj up or power-up) with (set$4 or adjus$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 10:14
S6	42	S3 and period with power with (adjus$4 or set$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 10:24
S7	0	S3 and GPS with predict with power with (adjust or set)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 10:38
S8	43	S3 and GPS with predict and power with (adjust or set)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 10:38

S9	1	S3 and GPS with predict and (power-up or power adj up) with (adjust or set)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 11:01
S10	28	S3 and GPS with predict and (power-up or power adj up)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 11:02
S11	2	"20080150797"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/04 11:27
S12	5	(("6731701") or ("6775802") or ("6611756") or ("6252545") or ("6965760")).PN.	USPAT; USOCR	OR	OFF	2010/05/04 11:29
S13	5	"1" and mean adj for	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:16
S14	1	("20090009387").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2010/05/07 10:16
S15	0	S14 and mean adj for	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:16
S16	0	S14 and mean	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:16
S17	0	S14 and means	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:17

S18	3680	342/357.06, "357.12", "357".S13.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:38
S19	2327	S18 and (wakeup or power-up or power adj up or standard or normal)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:39
S20	743	S18 and (wakeup or power-up or power adj up or standard or normal) and position with error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:39
S21	112	S18 and (wakeup or power-up or power adj up or standard or normal) with period	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:40
S22	19	S18 and (wakeup or power-up or power adj up or standard adj mode or normal adj mode) with period	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 10:54
S23	5	"1" and mean adj for	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 13:42
S24	3680	342/357.06, "357.12", "357".S23.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 13:42
S25	19	S24 and (wakeup or power-up or power adj up or standard adj mode or normal adj mode) with period	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 13:42
S26	12	S25 and communication	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 13:42

S27	1	S25 and communication adj network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 13:43
S28	2	S25 and wireless adj network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 13:43
S29	1884	455/343.1-343.6.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 14:16
S30	242	S29 and wireless adj network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 14:17
S31	19	S30 and (wakeup or power-up or power adj up or standard adj mode or normal adj mode) with period	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 14:17
S32	2	S31 and position with error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 14:22
S33	1	S27 and position with error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 14:28
S34	7	S30 and position with error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2010/05/07 14:28
S35	7675	342/357.2-357.78.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/07 17:08

S36	35	S35 and power with up and gps with prediction	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/07 17:09
S37	1	S35 and power with up and gps with prediction and cramer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/07 17:21
S38	4	S35 and power with up with prediction	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/07 17:22
S39	22	("5731786" | "5798732" | "5847680" | "6118977" | "6252545" | "6295023").PN. OR ("6775802").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/01/07 17:24
S40	164	power with up and gps with prediction	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/07 17:26
S41	7676	342/357.2-357.78.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/10 13:14
S42	1	S41 and power with on and position and error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/10 13:14
S43	853432	S41 and wake with mode position and error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/10 13:15
S44	85	S41 and wake with mode and position and error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/10 13:15

S45	2	"20090009387"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/10 16:37
S46	1	S45 and neural adj network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/10 16:37
S47	2	"20090009387"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/10 16:51
S48	430	342/357.74.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/10 16:59
S49	30	S48 and powe$4 and position and error and prediction	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/10 17:00
S50	1937	455/343.1-343.5.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/11 13:05
S51	248	S50 and power adj up	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/11 13:06
S52	56	S50 and power adj up and position and error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/11 13:06
S53	11	S52 and GPS	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/01/11 13:07

S54	2	("5592173").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/01/11 13:26
S55	201	("4449248" | "5101510" | "5128938" | "5291542" | "5418537" | "5448773").PN. OR ("5592173").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/01/11 13:26
S56	22	S55 and wireless adj network and GPS	US-PGPUB; USPAT; USOCR	OR	OFF	2011/01/11 13:26
S57	5	S56 and power with up	US-PGPUB; USPAT; USOCR	OR	OFF	2011/01/11 13:27
S58	1	S54 and position and error	US-PGPUB; USPAT; USOCR	OR	OFF	2011/01/11 13:28
S59	0	S58 and wireless	US-PGPUB; USPAT; USOCR	OR	OFF	2011/01/11 13:46
S60	0	S58 and network	US-PGPUB; USPAT; USOCR	OR	OFF	2011/01/11 13:46
S61	8421	342/357.2-357.78.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/24 15:12
S62	0	S61 and wireless adj network and position and error and GPS with power with on	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/24 15:14
S63	224	S61 and wireless adj network and position and error and GPS with power	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/24 15:14
S64	36	S61 and wireless adj network and position and error and GPS with power with up	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/24 15:28
S65	449	342/357.74.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/24 15:48

S66	5	S65 and position and error with power with up	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/24 15:49
S67	8421	342/357.2-357.78.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/24 17:01
S68	34	S67 and stand adj alone adj mode and wireless adj network	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/24 17:02
S69	8421	342/357.2-357.78.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/25 10:09
S70	1	S69 and period with (power-up or power adj up) with error with position	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/25 10:10
S71	19	S69 and period with (power-up or power adj up)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/25 10:11
S72	22	("5883594" | "5905460").PN. OR ("6212133").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/05/25 10:43
S73	711	positioning adj system and gps with predict$3 with time	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/25 14:07
S74	4	S73 and period with (power-up or power adj up)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/25 14:08

S75	8421	342/357.2-357.78.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/25 16:08
S76	17	S75 and position and error and cramer with bound	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/25 16:08
S77	15	S76 and power	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/25 16:14
S78	0	S76 and power with aquisition with time	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/25 16:14
S79	11444588	S76 and power time	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/25 16:15
S80	7	S76 and power with time	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/25 16:15
S81	2	"20090003987"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/27 11:38
S82	2	"20090009387"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/27 11:38
S83	449	342/357.74.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/27 11:41

S84	5	S83 and position and error with (power with up or power-up or power adj up)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/05/27 11:42
S85	26	("5592173" | "5594453" | "5629708" | "5654718" | "5864315" | "5893044" | "5940027" | "6297771").PN. OR ("6662107").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/05/27 13:07
S86	21	("20020101374" | "20020111171" | "20020168985" | "20030134646" | "20050168382" | "5629708" | "5883594" | "6058338" | "6064336" | "6133871" | "6134483" | "6141570" | "6211817" | "6243648" | "6298093" | "6323803" | "6373429" | "6400314" | "6437735" | "6662107" | "6937865").PN. OR ("7256731").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2011/05/27 13:35
S87	2	("6621452").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/05/27 13:50
S88	8428	342/357.2-357.78.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/05/27 15:15
S89	3	S88 and position and error with wireless adj network and (power with up or power-up or power adj up)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/05/27 15:16
S90	1	S88 and position and error with wireless adj network and GPS with (active or power adj up or power-up)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/05/27 15:18

S91	23	S88 and position and error with wireless adj network and GPS	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/05/27 15:19
S92	450	342/357.74.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/06/01 15:37
S93	31	S92 and wireless adj communication with position	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2011/06/01 15:38

EAST Search History (Interference)

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6/2/2011 1:11:03 PM
C:\ Documents and Settings\ NNguyen7\ My Documents\ EAST\ Workspaces\ 11661707-Self Monitoring GPS on Mobile Device.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11661707	MALANEY, ROBERT ANDERSON
	Examiner	Art Unit
	NGA X NGUYEN	3662

SEARCHED			
Class	Subclass	Date	Examiner
342	357.01-357.17	5/4, 7/2010	NXN
455	343.1-343.6	5/7/2010	NXN
342	357.2-357.78	01/07-11/2011	NXN
455	343.1-343.5	01/11/2011	NXN
342	357.2-357.78	5/24/2011 thru 6/2/2011	NXN

SEARCH NOTES		
Search Notes	Date	Examiner
TEXT SEARCH	5/4,7/2010	NXN
PLUS SEARCH	5/7/2010	NXN
TEXT SEARCH	01/07-11/2011	NXN
TEXT SEARCH	5/24/2011 thru 6/02/2011	NXN

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
342	357.74, 357.42	6/2/2011	NXN
TEXT SEARCH		6/2/2011	NXN

FORM PTO-1449 U. S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)	ATTY. DOCKET NO.	SERIAL NO.
	U 016731-5	**11/661,707**
	APPLICANT	
	Robert Anderson MALANEY	
	FILING DATE	GROUP
	February 11, 2008	**3662**

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	REFERENCE DESIGNATION	DOCUMENT NUMBER	DATE	NAME	FILING DATE IF APPROPRIATE
	AA				
	AB				
	AC				
	AD				
	AE				
	AF				
	AG				
	AH				
	AI				
	AJ				
	AK				

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION	
					YES	NO
	AL					
	AM					
	AN					
	AO					
	AP					

OTHER ART (Including Author, Title, Date, Pertinent Dates, Etc.)

/NXN/	AQ	a second Office Action dated May 24, 2010 in respect of Chinese corresponding Application No. 200580036782.3 and an English-language version thereof
/NXN/	AR	a third Office Action dated January 19, 2011 in respect of Chinese corresponding Application No. 200580036782.3 and an English-language version thereof
	AS	

EXAMINER	/Nga Nguyen/	DATE CONSIDERED	06/02/2011

EXAMINER: Initial if citation 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.

Form PTO-1449 **6-4**

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11661707	MALANEY, ROBERT ANDERSON
	Examiner	Art Unit
	NGA X NGUYEN	3662

✓	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	05/07/2010	01/11/2011	06/02/2011						
	1	✓	✓	=						
	2	✓	✓	=						
	3	✓	✓	=						
	4	✓	✓	=						
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	35	✓	=	=						
	36	✓	=	=						

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/661,707	02/11/2008	Robert Anderson Malaney	U 016731-5	9076

TITLE OF INVENTION: SELF MONITORING GPS ON MOBILE DEVICE

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$755	$300	$0	$1055	09/12/2011

EXAMINER	ART UNIT	CLASS-SUBCLASS
NGUYEN, NGA X	3662	342-357150

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 Ladas & Parry LLP
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: NARISTE NETWORKS PTY LTD
(B) RESIDENCE: (CITY and STATE OR COUNTRY): NEW SOUTH WALES, AUSTRALIA

Recorded: May 19, 2008
Reel/Frame: 020990/0609

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 12-0425 (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 June 28, 2011

Typed or printed name Raymond A. DiPerna Registration No. 44063

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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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Robert Anderson MALANEY

Serial No.: 11/661,707 Group No.: 3662

Filed: February 11, 2008 Examiner: N. Nguyen

For: SELF MONITORING GPS ON MOBILE DEVICE

Attorney Docket No.: U 016731-5

Mail Stop Issue Fee
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AFTER ALLOWANCE UNDER 37 C.F.R. § 1.312

The Issue Fee being paid herewith, please amend the above-identified application as follows pursuant to 37 C.F.R. § 1.312.

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Date: June 28, 2011

Signature

Raymond A. DiPerna
(*type or print name of person certifying*)

IN THE CLAIMS

The following is a complete listing of the claims, and replaces all earlier versions and listings.

1. (previously presented) A method of acquiring GPS on a mobile wireless communication device for a wireless communications network, said mobile device possessing wireless communications capability for said wireless network and an embedded GPS module for GPS capability, said method comprising:

setting a current value of a period of a power-up phase of said GPS dependent on a current radio position and error of said mobile device in the wireless network determined from the wireless network and adaptive predictions of when said GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

2. (previously presented) The method according to claim 1, wherein the current radio position and error are determined using Cramer-Rao Bounds.

3. (previously presented) The method according to claim 1, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable statistical bounds.

4. (previously presented) The method according to claim 1, wherein said mobile device determines dynamically an optimal period of the power-up phase.

5. (previously presented) The method according to claim 1, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

6. (previously presented) The method according to claim 5, wherein said adaptive-filter and machine learning techniques are implemented using said mobile device.

7. (previously presented) The method according to claim 1, further comprising:

if at least one of said position error and acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

if at least one of said position error and acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

8. (previously presented) The method according to claim 1, wherein said mobile device comprises a power limited device.

9. (previously presented) The method according to claim 1, wherein said embedded GPS module comprises an embedded GPS device.

10. (previously presented) The method according to claim 1, further comprising the step of making adaptive predictions using a neural network.

11. (previously presented) The method according to claim 1, wherein said setting step comprises:

predicting a next position at a next scheduled power-up time using a number of last positions reported of said mobile device in the wireless network determined from the wireless network;

comparing said predicted position at said next power-up time with an actual position of said mobile device in the wireless network determined from the wireless network and determining said position error; and

storing current values of said period of the power-up phase, acquisition time, said position error, and position in a storage unit of said mobile device.

12. (previously presented) A mobile wireless communication device for a wireless communications network, said mobile device possessing wireless communications capability for said wireless network, comprising:

a processor;

a memory coupled to said processor;

an embedded GPS module coupled to said processor providing a GPS capability for said mobile device; and

means for setting a current value of a period of a power-up phase of said GPS dependent on the current radio position and error of said mobile device in the wireless network determined from the wireless network and adaptive predictions of when said GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

13. (previously presented) The mobile device according to claim 12, wherein the current radio position and error are determined using Cramer-Rao Bounds.

14. (previously presented) The mobile device according to claim 12, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable statistical bounds.

15. (previously presented) The mobile device according to claim 12, wherein said mobile device determines dynamically an optimal period of the power-up phase.

16. (previously presented) The mobile device according to claim 12, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

17. (previously presented) The mobile device according to claim 16, wherein said adaptive-filter and machine-learning techniques are implemented using said mobile device.

18. (currently amended) The mobile device according to claim 12, further comprising:

means for, if at least one of ~~predicted accuracy~~ position error and ~~predicted~~ acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

means for, if at least one of ~~predicted accuracy~~ said position error and ~~predicted~~ acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

19. (previously presented) The mobile device according to claim 12, wherein said mobile device comprises a power limited device.

20. (previously presented) The mobile device according to claim 19, further comprising a battery for powering said mobile device.

21. (previously presented) The mobile device according to claim 12, further comprising a neural network module for making adaptive predictions.

22. (currently amended) The mobile device according to claim 12, wherein said setting means comprises:

means for predicting a next position at a next scheduled power-up time using a number of last positions reported of said mobile device in the wireless network determined from the wireless network;

means for comparing said predicted position at said next power-up time with an actual position of said mobile device in the wireless network determined from the wireless network and determining [[a]] said position error; and

means for storing current values of a period of the power-up phase, acquisition time, said position error, and position in a storage unit of said mobile device.

23. (previously presented) A computer program product for a mobile wireless communication device for a wireless communication network, said mobile device possessing wireless communications capability for said wireless network and an embedded GPS module

for GPS capability, said computer program product having a computer readable medium storing a computer program for acquiring GPS on said mobile device, comprising:

computer program code means for interfacing with the GPS capability of said mobile device; and

computer program code means for setting a current value of the period of the power-up phase of said GPS dependent on a current radio position and error of said mobile device in the wireless network determined from the wireless network and adaptive predictions of when said GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

24. (previously presented) The computer program product according to claim 23, wherein the current radio position and error are determined using Cramer-Rao Bounds.

25. (previously presented) The computer program product according to claim 23, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable statistical bounds.

26. (previously presented) The computer program product according to claim 23, wherein said computer program product determines dynamically an optimal period of the power-up phase.

27. (previously presented) The computer program product according to claim 23, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

28. (previously presented) The computer program product according to claim 27, wherein said adaptive-filter and machine-learning techniques are implemented using said mobile device.

29. (previously presented) The computer program product according to claim 23, further comprising:

computer program code means for, if at least one of said position error and acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

computer program code means for, if at least one of said position error and acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

30. (previously presented) The computer program product according to claim 23, wherein said mobile device comprises a power limited device.

31. (previously presented) The computer program product according to claim 30, wherein said mobile device comprises a battery for powering said mobile device.

32. (previously presented) The computer program product according to claim 23, further comprising computer program code means for providing a neural network module to make adaptive predictions.

33. (currently amended) The computer program product according to claim 23, wherein said computer program code means for setting comprises:

computer program code means for predicting at a next position a next scheduled power-up time using a number of last positions reported of said mobile device in the wireless network determined from the wireless network;

computer program code means for comparing said predicted position at said next power-up time with an actual position of said mobile device in the wireless network determined from the wireless network and determining [[a]] said position error; and

computer program code means for storing current values of a period of the power-up phase, acquisition time, said position error, and position in a storage unit of said mobile device.

34. (previously presented) A method of acquiring GPS on a mobile device for a wireless network, said mobile device possessing wireless communications capability for said wireless network and GPS capability, said method comprising the steps of:

using a position error of said mobile device in the wireless network determined from the wireless network;

if the position error is too large, adjusting a current value of a period of a power-up phase of said GPS downward;

if the position error is too small, adjusting the current value of said period of the power-up phase of said GPS upward;

estimating using a neural network a new value of said period of the power-up phase of said GPS dependent upon said position error; and

setting a new value of said period of the power-up phase of said GPS to a weighted value dependent upon an acceptable error bound.

35. (previously presented) A method of acquiring GPS on a mobile device for a wireless network, said mobile device possessing wireless communications capability for said wireless network and GPS capability, said method comprising the steps of:

using an acquisition time at a last position fix of the mobile device in the wireless network determined from the wireless network;

if the acquisition time is too large, adjusting a current value of a period of a power-up phase of said GPS downward;

if the acquisition time is too small, adjusting the current value of said period of the power-up phase of said GPS upward;

estimating using a neural network a new value of said period of the power-up phase of said GPS dependent upon said acquisition time; and

setting a new value of said period of the power-up phase of said GPS to a weighted value dependent upon an acceptable bound.

36. (previously presented) The method according to claim 34, wherein the position error is the Cramer-Rao Bound on the radio position of the mobile device.

37. - 40. (canceled)

REMARKS

Claims 1-36 are pending in this application. Dependent claims 18, 22, and 33 have been amended herein.

The amendments presented herein were discussed with the Examiner in telephone and e-mail communications with the Examiner subsequent to the mailing of the Notice of Allowance. In an e-mail to the undersigned attorney on June 23, 2011, the Examiner stated that she expected to enter these amendments. The Examiner is thanked for kindly discussing these matters with the undersigned.

This Amendment After Allowance is deemed to raise no new issues, require no new search, and require no substantial work on the part of the Patent and Trademark Office. Entry of this Amendment is therefore requested.

Respectfully submitted,

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Page 417 of 448 (IPR2023-01374)
Google LLC et al v. Nariste Networks Pty. Ltd.

Electronic Patent Application Fee Transmittal	
Application Number:	11661707
Filing Date:	11-Feb-2008
Title of Invention:	SELF MONITORING GPS ON MOBILE DEVICE
First Named Inventor/Applicant Name:	Robert Anderson Malaney
Filer:	Janet I. Cord/Olivia Stanford
Attorney Docket Number:	U 016731-5
Filed as Small Entity	

U.S. National Stage under 35 USC 371 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	755	755
Publ. Fee- early, voluntary, or normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1055**

Electronic Acknowledgement Receipt	
EFS ID:	10403543
Application Number:	11661707
International Application Number:	
Confirmation Number:	9076
Title of Invention:	SELF MONITORING GPS ON MOBILE DEVICE
First Named Inventor/Applicant Name:	Robert Anderson Malaney
Customer Number:	00140
Filer:	Janet I. Cord/Olivia Stanford
Filer Authorized By:	Janet I. Cord
Attorney Docket Number:	U 016731-5
Receipt Date:	28-JUN-2011
Filing Date:	11-FEB-2008
Time Stamp:	14:23:35
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1055
RAM confirmation Number	715
Deposit Account	120425
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Issue Fee Payment (PTO-85B)	0167315issuefee.pdf	106448 0cb1b026a8b8ed4c5f4142c8f60e955862429e1a	no	1
Warnings:					
Information:					
2	Amendment after Notice of Allowance (Rule 312)	0167315amdafterallowance.pdf	331827 efc012280b3706e6ad308fe1683473b594c81261	no	11
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	31656 2514a313a49887ddf2a15af890603b72a382c677	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	469931		

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.

Substitute for form 1449/PTO and PTO/SB/08				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(use as many sheets as necessary)*				**Application Number**	11/661,707
				Filing Date	11 February, 2008
				First Named Inventor	**MALANEY**, Robert Anderson
				Art Unit	3662
				Examiner Name	Nguyen, Nga X
Sheet	1	of	2	Attorney Docket No	**U 016731-5**

US PATENT DOCUMENTS					
Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
/NXN/		US-6,298,229 B1	10-02-2001	Tomlinson Jr Harold Woodruff [US] et al	1, 12, 23, 34, 35
/NXN/		US-5,864,315 A	01-26-1999	Welles II Kenneth Brakeley [US] et al	1, 12, 23, 34, 35
		US-			
		US-			
		US-			
		US-			
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		US-			
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		US-			

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
/NXN/		GB 2 394 134 A	04-14-2004	ParthusCeva Ireland Ltd	1, 12, 23, 34, 35	

Examiner Signature		Date Considered	

*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 Kinds 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. This collection of information is required by 37 CFR 1.97 and 1.98. 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.
SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

[3119639]:wxb

Substitute for form 1449/PTO and PTO/SB/08				Complete if Known	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT *(use as many sheets as necessary)*				**Application Number**	11/661,707
				Filing Date	11 February, 2008
				First Named Inventor	**MALANEY**, Robert Anderson
				Art Unit	3662
				Examiner Name	Nguyen, Nga X
Sheet	2	of	2	Attorney Docket No	**U 016731-5**

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials *	Cite No[1]	Include name of Author (in CAPITALS), title of the article, (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
/NXN/		Chinese First Office Action, 20 November, 2009 – State Intellectual Property Office of P.R.C. and English translation	
/NXN/		European Communication, 28 May, 2010 – European Patent Office	

Examiner Signature	/Nga Nguyen/	Date Considered	07/11/2011

*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] Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. 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.
SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

[3119639]:wxb

OK TO ENTER: /NXN/

IN THE CLAIMS

The following is a complete listing of the claims, and replaces all earlier versions and listings.

1. (previously presented) A method of acquiring GPS on a mobile wireless communication device for a wireless communications network, said mobile device possessing wireless communications capability for said wireless network and an embedded GPS module for GPS capability, said method comprising:

setting a current value of a period of a power-up phase of said GPS dependent on a current radio position and error of said mobile device in the wireless network determined from the wireless network and adaptive predictions of when said GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

2. (previously presented) The method according to claim 1, wherein the current radio position and error are determined using Cramer-Rao Bounds.

3. (previously presented) The method according to claim 1, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable statistical bounds.

4. (previously presented) The method according to claim 1, wherein said mobile device determines dynamically an optimal period of the power-up phase.

5. (previously presented) The method according to claim 1, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

6. (previously presented) The method according to claim 5, wherein said adaptive-filter and machine learning techniques are implemented using said mobile device.

7. (previously presented) The method according to claim 1, further comprising:

if at least one of said position error and acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

if at least one of said position error and acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

8. (previously presented) The method according to claim 1, wherein said mobile device comprises a power limited device.

9. (previously presented) The method according to claim 1, wherein said embedded GPS module comprises an embedded GPS device.

10. (previously presented) The method according to claim 1, further comprising the step of making adaptive predictions using a neural network.

11. (previously presented) The method according to claim 1, wherein said setting step comprises:

predicting a next position at a next scheduled power-up time using a number of last positions reported of said mobile device in the wireless network determined from the wireless network;

comparing said predicted position at said next power-up time with an actual position of said mobile device in the wireless network determined from the wireless network and determining said position error; and

storing current values of said period of the power-up phase, acquisition time, said position error, and position in a storage unit of said mobile device.

12. (previously presented) A mobile wireless communication device for a wireless communications network, said mobile device possessing wireless communications capability for said wireless network, comprising:

a processor;

a memory coupled to said processor;

an embedded GPS module coupled to said processor providing a GPS capability for said mobile device; and

means for setting a current value of a period of a power-up phase of said GPS dependent on the current radio position and error of said mobile device in the wireless network determined from the wireless network and adaptive predictions of when said GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

13. (previously presented) The mobile device according to claim 12, wherein the current radio position and error are determined using Cramer-Rao Bounds.

14. (previously presented) The mobile device according to claim 12, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable statistical bounds.

15. (previously presented) The mobile device according to claim 12, wherein said mobile device determines dynamically an optimal period of the power-up phase.

16. (previously presented) The mobile device according to claim 12, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

17. (previously presented) The mobile device according to claim 16, wherein said adaptive-filter and machine-learning techniques are implemented using said mobile device.

18. (currently amended) The mobile device according to claim 12, further comprising:

means for, if at least one of ~~predicted accuracy~~ position error and ~~predicted~~ acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

means for, if at least one of ~~predicted accuracy~~ said position error and ~~predicted~~ acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

19. (previously presented) The mobile device according to claim 12, wherein said mobile device comprises a power limited device.

20. (previously presented) The mobile device according to claim 19, further comprising a battery for powering said mobile device.

21. (previously presented) The mobile device according to claim 12, further comprising a neural network module for making adaptive predictions.

22. (currently amended) The mobile device according to claim 12, wherein said setting means comprises:

means for predicting a next position at a next scheduled power-up time using a number of last positions reported of said mobile device in the wireless network determined from the wireless network;

means for comparing said predicted position at said next power-up time with an actual position of said mobile device in the wireless network determined from the wireless network and determining [[a]] said position error; and

means for storing current values of a period of the power-up phase, acquisition time, said position error, and position in a storage unit of said mobile device.

23. (previously presented) A computer program product for a mobile wireless communication device for a wireless communication network, said mobile device possessing wireless communications capability for said wireless network and an embedded GPS module

for GPS capability, said computer program product having a computer readable medium storing a computer program for acquiring GPS on said mobile device, comprising:

computer program code means for interfacing with the GPS capability of said mobile device; and

computer program code means for setting a current value of the period of the power-up phase of said GPS dependent on a current radio position and error of said mobile device in the wireless network determined from the wireless network and adaptive predictions of when said GPS should be powered on to meet specifications on positioning accuracy and GPS acquisition time.

24. (previously presented) The computer program product according to claim 23, wherein the current radio position and error are determined using Cramer-Rao Bounds.

25. (previously presented) The computer program product according to claim 23, wherein the period of the power-up phase is set while retaining the accuracy of a position fix and acquisition times of the position fix within acceptable statistical bounds.

26. (previously presented) The computer program product according to claim 23, wherein said computer program product determines dynamically an optimal period of the power-up phase.

27. (previously presented) The computer program product according to claim 23, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

28. (previously presented) The computer program product according to claim 27, wherein said adaptive-filter and machine-learning techniques are implemented using said mobile device.

29. (previously presented) The computer program product according to claim 23, further comprising:

computer program code means for, if at least one of said position error and acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

computer program code means for, if at least one of said position error and acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

30. (previously presented) The computer program product according to claim 23, wherein said mobile device comprises a power limited device.

31. (previously presented) The computer program product according to claim 30, wherein said mobile device comprises a battery for powering said mobile device.

32. (previously presented) The computer program product according to claim 23, further comprising computer program code means for providing a neural network module to make adaptive predictions.

33. (currently amended) The computer program product according to claim 23, wherein said computer program code means for setting comprises:

computer program code means for predicting at a next position a next scheduled power-up time using a number of last positions reported of said mobile device in the wireless network determined from the wireless network;

computer program code means for comparing said predicted position at said next power-up time with an actual position of said mobile device in the wireless network determined from the wireless network and determining [[a]] said position error; and

computer program code means for storing current values of a period of the power-up phase, acquisition time, said position error, and position in a storage unit of said mobile device.

34. (previously presented) A method of acquiring GPS on a mobile device for a wireless network, said mobile device possessing wireless communications capability for said wireless network and GPS capability, said method comprising the steps of:

using a position error of said mobile device in the wireless network determined from the wireless network;

if the position error is too large, adjusting a current value of a period of a power-up phase of said GPS downward;

if the position error is too small, adjusting the current value of said period of the power-up phase of said GPS upward;

estimating using a neural network a new value of said period of the power-up phase of said GPS dependent upon said position error; and

setting a new value of said period of the power-up phase of said GPS to a weighted value dependent upon an acceptable error bound.

35. (previously presented) A method of acquiring GPS on a mobile device for a wireless network, said mobile device possessing wireless communications capability for said wireless network and GPS capability, said method comprising the steps of:

using an acquisition time at a last position fix of the mobile device in the wireless network determined from the wireless network;

if the acquisition time is too large, adjusting a current value of a period of a power-up phase of said GPS downward;

if the acquisition time is too small, adjusting the current value of said period of the power-up phase of said GPS upward;

estimating using a neural network a new value of said period of the power-up phase of said GPS dependent upon said acquisition time; and

setting a new value of said period of the power-up phase of said GPS to a weighted value dependent upon an acceptable bound.

36. (previously presented) The method according to claim 34, wherein the position error is the Cramer-Rao Bound on the radio position of the mobile device.

37. - 40. (canceled)

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/661,707	02/11/2008	Robert Anderson Malaney	U 016731-5	9076

140 7590 08/24/2011

LADAS & PARRY LLP
1040 Avenue of the Americas
NEW YORK, NY 10018-3738

EXAMINER	
NGUYEN, NGA X	
ART UNIT	PAPER NUMBER
3662	

NOTIFICATION DATE	DELIVERY MODE
08/24/2011	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):

nyuspatactions@ladas.com
nymail@ladas.com

PTOL-90A (Rev. 04/07)

Response to Rule 312 Communication	Application No.	Applicant(s)
	11/661,707	MALANEY, ROBERT ANDERSON
	Examiner	**Art Unit**
	NGA X. NGUYEN	3662

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

1. ☒ The amendment filed on *28 June 2011* under 37 CFR 1.312 has been considered, and has been:

   a) ☒ entered.

   b) ☐ entered as directed to matters of form not affecting the scope of the invention.

   c) ☐ disapproved because the amendment was filed after the payment of the issue fee.
   Any amendment filed after the date the issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from issue.

   d) ☐ disapproved. See explanation below.

   e) ☐ entered in part. See explanation below.

/Thomas H. Tarcza/
Supervisory Patent Examiner, Art Unit 3662

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/661,707	09/20/2011	8022870	U 016731-5	9076

140 7590 08/31/2011

LADAS & PARRY LLP
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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 595 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):

Robert Anderson Malaney, New South Wales, AUSTRALIA;

IR103 (Rev. 10/09)

Practitioner's Docket No. U 016731-5 ***PATENT***

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Number:	8,022,870 B2
Issued:	September 20, 2011
Name of Patentee:	Robert Anderson MALANEY
Title of Invention:	SELF MONITORING GPS ON MOBILE DVICE

Certificate of Correction Branch
Director of the United States Patent and Trademark Office
P. O. Box 1450
Alexandria, VA 22313-1450

ATTENTION: Certificate of Correction Branch
of the Office of Patent Publication

REQUEST FOR CERTIFICATE OF CORRECTION OF PATENT FOR PTO MISTAKE (37 C.F.R. §1.322(a))

NOTE: "If such a request for correction was incurred through the fault of the United States Patent and Trademark Office (Office), and is clearly disclosed in the records of the Office, and is accompanied by documentation that unequivocally supports the patentee's assertion(s), a Certificate of Correction will be expeditiously issued. Such supporting documentation can consist of relevant photocopied receipts, manuscript pages, correspondence dated and received by the Office, photocopies of Examiners' responses regarding entry of amendments, or any other validation that supports the patentee's request so that the request can be processed without the patent file." Notice of September 17, 2002, 1262 OG 96.

1. Attached is Form PTO—1050 (PTO/SB/44) suitable for printing.

NOTE: Form PTO-1050 (or PTO/SB/44), using the column and line number in the printed patent, should be used exclusively regardless of the length or complexity of the subject matter. M.P.E.P. § 1485, 7th ed.

NOTE: The patent grant should be retained by the patentee. The PTO does not attach the Certificate of Correction to the patentee's copy of the patent. The patent grant will be returned to the patentee if submitted. M.P.E.P. § 1485, 8th ed.

2. The exact page and line number where the errors are shown correctly in the application file are:

Amendment After Allowance filed June 28, 2011, page 3 (copy attached)

NOTE: The exact page and line number where the errors occur in the application file should be identified on the request. However, on form PTO/SB/44, only the column and line number in the printed patent should be used. M.P.E.P. § 1480, 8th Edition.

Date: November 14, 2011

3. **Please send the Certificate to:**

Name: Raymond A. DiPerna

Address: c/o Ladas & Parry LLP
1040 Avenue of the Americas
New York, NY 10018-3738

(complete, if applicable)

Signature(s) of patentee(s)

Raymond A. DiPerna

or

Signature of assignee or person authorized to sign on behalf of assignee

(type or print name of assignee)

☐ Assignment recorded on

Reel _____
Frame _____

(type or print name of authorized person signing)

Title of authorized person signing

☐ Recordal of assignment attached

☐ Attached is a "STATEMENT UNDER 37 CFR 3.73(b)," establishing the right of the assignee to take action in this case.

NOTE: "A certificate of correction, under 35 U.S.C. 254, may be issued at the request of the patentee or [the patentee's] assignee." 37 C.F.R. § 1.322(a). The certificate of correction can be signed by the attorney of record who acts on behalf of the inventor(s) or assignee(s).

PTO/SB/44 (02-01)
Approved for use through 1/31/2004. OMB 0651-0033
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.

(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO.: 8,022,870 B2
DATED : September 20, 2011
INVENTOR(S): Robert Anderson MALANEY

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

Column 12, line 35, after "claim" insert -- 1--

MAILING ADDRESS OF SENDER:

Raymond A. DiPerna
c/o Ladas & Parry LLP
1040 Avenue of the Americas
New York, N.Y. 10018-3738
Reg. No. 44063
Tel. No. (212) 708-1950

PATENT NO. 8,022,870 B2

No. of additional copies

Burden Hour Statement: This form is estimated to take 1.0 hour 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 Office, Patent and Trademark Office, 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.

5. (previously presented) The method according to claim 1, wherein said current value of said period of the power-up phase is set using adaptive-filter and machine-learning techniques.

6. (previously presented) The method according to claim 5, wherein said adaptive-filter and machine learning techniques are implemented using said mobile device.

7. (previously presented) The method according to claim 1, further comprising:

if at least one of said position error and acquisition times of GPS fail to meet acceptable bounds, reducing said value of said period of the power-up phase; and

if at least one of said position error and acquisition times of GPS meet said acceptable bounds, increasing said value of said period of the power-up phase.

8. (previously presented) The method according to claim 1, wherein said mobile device comprises a power limited device.

9. (previously presented) The method according to claim 1, wherein said embedded GPS module comprises an embedded GPS device.

10. (previously presented) The method according to claim 1, further comprising the step of making adaptive predictions using a neural network.

Electronic Acknowledgement Receipt	
EFS ID:	11411000
Application Number:	11661707
International Application Number:	
Confirmation Number:	9076
Title of Invention:	SELF MONITORING GPS ON MOBILE DEVICE
First Named Inventor/Applicant Name:	Robert Anderson Malaney
Customer Number:	140
Filer:	Janet I. Cord/Olivia Stanford
Filer Authorized By:	Janet I. Cord
Attorney Docket Number:	U 016731-5
Receipt Date:	15-NOV-2011
Filing Date:	11-FEB-2008
Time Stamp:	15:13:21
Application Type:	U.S. National Stage under 35 USC 371

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	Request for Certificate of Correction	0167315rqcertcor.pdf	180785 8bae28d9f7974f7c58256f42984789f4b6cc5d21	no	4

Warnings:
Information:

Total Files Size (in bytes):	180785

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

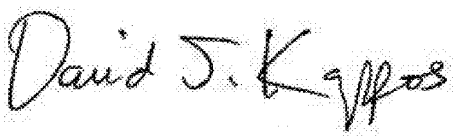
CERTIFICATE OF CORRECTION

PATENT NO. : 8,022,870 B2
APPLICATION NO. : 11/661707
DATED : September 20, 2011
INVENTOR(S) : Robert Anderson Malaney

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

Column 12, line 35, after "claim" insert -- 1 --

Signed and Sealed this
Third Day of January, 2012



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

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT4181537

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
NARISTE NETWORKS PTY LTD	12/12/2016

RECEIVING PARTY DATA

Name:	ROBERT ANDERSON MALANEY
Street Address:	16 CARLYLE RD
City:	EAST LINDFIELD
State/Country:	AUSTRALIA
Postal Code:	2070

PROPERTY NUMBERS Total: 2

Property Type	Number
Patent Number:	8022870
Application Number:	14031992

CORRESPONDENCE DATA

Fax Number:

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

Phone: 61294161983
Email: robert@nariste.com
Correspondent Name: ROBERT A MALANEY
Address Line 1: 16 CARLYLE RD
Address Line 4: EAST LINDFIELD, AUSTRALIA 2070

NAME OF SUBMITTER:	ROBERT A. MALANEY
SIGNATURE:	/Robert A. Malaney/
DATE SIGNED:	12/12/2016
	This document serves as an Oath/Declaration (37 CFR 1.63).

Total Attachments: 2
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source=deed1#page2.tif

DEED

DEED made 13th December 2016.

BETWEEN: ROBERT ANDERSON MALANEY of 16 Carlyle Road, Lindfield, New South Wales (the "Assignee")

AND: NARISTE NETWORKS PTY LIMITED (ACN 117 199 363) of 16 Carlyle Road, Lindfield, New South Wales (the "Assignor")

RECITALS:

A. By patent US 8,022,870 ("the patent") the Assignor has obtained a patent in the United States of America for an invention entitled "SELF MONITORING GPS ON MOBILE DEVICE" ("the invention").

B. The Assignor has agreed to assign to the Assignee all his right, title and interest in and to the patent and the invention, including the right to apply for and obtain patents in any country for the invention, including all reissue and continuation reissue patents derived from the patent US 8,022,870.

THIS DEED WITNESSES AS FOLLOWS:

1. *In consideration of the payment of the sum of $10.00 by the Assignee to the* Assignor, the Assignor hereby assigns to the Assignee all his right, title and interest in and to the patent and the invention, including the right to apply for and obtain patents in any country for the invention.

2. The Assignor agrees, at the expense of the Assignee, to do all such further acts and execute all such further documents as may be necessary to transfer to the Assignee the patent and any patent that may be granted as a result of the patent.

3. For the avoidance of doubt, it is agreed that all fees, costs and expenses incurred by the Assignor (whether before or after the date of this Deed) in connection with enabling the Assignee to be registered as the sole owner of any patent that may be granted as a result of the patent, are to be borne and paid by the Assignee or (as the case may be) reimbursed to the Assignor by the Assignee, at the request of the Assignor.

EXECUTED AS A DEED

JUSTICE OF THE PEACE
I certify this is to be a true copy of the original document/s as sighted by me this day. Dated
Maxwell Leonard Press BAM JP #185060
32 Kissing Point Rd Turramurra NSW 2074
In and for the State of New South Wales

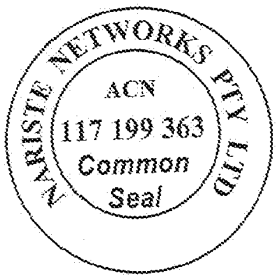
Signed, sealed and delivered by
ROBERT ANDERSON MALANEY
in the presence of

.....
Witness: #185060
Title:

.....
Robert Anderson Malaney

The Common Seal of
NARISTE NETWORKS PTY LIMITED
(ACN 117 199 363)
was affixed in accordance with
its Constitution

Director



506332207 10/31/2020

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT6378958

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
ROBERT A MALANEY	10/31/2020

RECEIVING PARTY DATA

Name:	NARISTE NETWORKS PTY LTD
Street Address:	16 CARLYLE RD
City:	EAST LINDFIELD
State/Country:	AUSTRALIA
Postal Code:	2070

PROPERTY NUMBERS Total: 1

Property Type	Number
Patent Number:	8022870

CORRESPONDENCE DATA

Fax Number:

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

Email: robert@nariste.com
Correspondent Name: ROBERT ANDERSON MALANEY
Address Line 1: 16 CARLYLE RD
Address Line 4: EAST LINDFIELD, AUSTRALIA 2070

NAME OF SUBMITTER:	ROBERT A. MALANEY
SIGNATURE:	/Robert A. Malaney/
DATE SIGNED:	10/31/2020
	This document serves as an Oath/Declaration (37 CFR 1.63).

Total Attachments: 2
source=deed RM to Narsite 2020#page1.tif
source=deed RM to Narsite 2020#page2.tif

DEED

DEED made 31 October 2020.

BETWEEN: ROBERT ANDERSON MALANEY of 16 Carlyle Road, Lindfield, New South Wales (the "Assignor")

AND: NARISTE NETWORKS PTY LIMITED (ACN 117 199 363) of 16 Carlyle Road, Lindfield, New South Wales (the "Assignee")

RECITALS:

A. By patent application US 15/376,627 ("the application") the Assignor has applied for and received a patent in the United States of America for an invention entitled "Reduced Power Use in Mobile GPS-Based Technologies," US RE48,206 ("the invention").

B. The Assignor has agreed to assign to the Assignee all his right, title and interest in and to the application and the invention, including the right to apply for and obtain patents in any country for the invention.

THIS DEED WITNESSES AS FOLLOWS:

1. In consideration of the payment of the sum of $10.00 by the Assignee to the Assignor, the Assignor hereby assigns to the Assignee all his right, title and interest in and to the application and the invention, including the right to apply for and obtain patents in any country for the invention. The Assignor also assigns the same right, title and interest to the Assignee to the related patents US 8,022,870 and US RE46,327.

2. The Assignor agrees, at the expense of the Assignee, to do all such further acts and execute all such further documents as may be necessary to transfer to the Assignee the application and any patent that may be granted as a result of the application and invention.

3. For the avoidance of doubt, it is agreed that all fees, costs and expenses incurred by the Assignor (whether before or after the date of this Deed) in connection with enabling the Assignee to be registered as the sole owner of any patent that may be granted as a result of the application, are to be borne and paid by the Assignee or (as the case may be) reimbursed to the Assignor by the Assignee, at the request of the Assignor.

EXECUTED AS A DEED

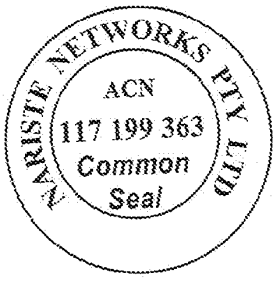
Signed, sealed and delivered by
ROBERT ANDERSON MALANEY
in the presence of

.....
Witness: [illegible]

Title: [illegible]

.....
Robert Anderson Malaney

The Common Seal of
NARISTE NETWORKS PTY LIMITED
(ACN 117 199 363)
was affixed in accordance with
its Constitution



.....
Director