

**Google LLC, Samsung Electronics Co., and Samsung
Electronics America**

v.

Nariste Networks Pty, Ltd.

Petitioner's Presentation For IPR2023-01374

U.S. Patent No. RE48,206

January 14, 2025

Overview

- Alleged Invention
- Overview of the Prior Art
- Claim construction issues
- Ground 1 – Obviousness over Watters
- Ground 2 – Obviousness over Nohara
- Ground 4 – Obviousness over Watters + Nohara
- Other issues and grounds

Overview

- Alleged Invention
- Overview of the Prior Art
- Claim construction issues
- Ground 1 – Obviousness over Watters
- Ground 2 – Obviousness over Nohara
- Ground 4 – Obviousness over Watters + Nohara
- Other issues and grounds

'206 patent's system: Turning on and off GPS to conserve power

US00RE48206E

(19) **United States**
(12) **Reissued Patent**
Malaney

(10) **Patent Number:** **US RE48,206 E**
(45) **Date of Reissued Patent:** ***Sep. 15, 2020**

(54) **REDUCED POWER USE IN MOBILE GPS-BASED TECHNOLOGIES**
(71) Applicant: **Robert Anderson Malaney**, East Lindfield (AU)
(72) Inventor: **Robert Anderson Malaney**, East Lindfield (AU)
(73) Assignee: **Robert Anderson Malaney**, East Lindfield, NSW (AU)
(*) Notice: This patent is subject to a terminal disclaimer.
(21) Appl. No.: **15/376,627**
(22) Filed: **Dec. 12, 2016**

Related U.S. Patent Documents
Reissue of:
(64) Patent No.: **8,022,870**
Issued: **Sep. 20, 2011**
Appl. No.: **11/661,707**
PCT Filed: **Aug. 31, 2005**
PCT No.: **PCT/AU2005/001315**
§ 371 (c)(1), **Feb. 11, 2008**
PCT Pub. No.: **WO2006/024112**
PCT Pub. Date: **Mar. 9, 2006**

(30) **Foreign Application Priority Data**
Sep. 2, 2004 (AU) 2004905024

(51) **Int. Cl.**
G01S 19/34 (2010.01)
G01S 19/42 (2010.01)
(52) **U.S. Cl.**
CPC **G01S 19/34** (2013.01); **G01S 19/42** (2013.01)

(58) **Field of Classification Search**
CPC **G01S 19/34; G01S 19/24**
USPC **342/557.74**
See application file for complete search history.

(56) **References Cited**
U.S. PATENT DOCUMENTS
5,592,173 A * 1/1997 Lau et al. 342/357.12
5,864,315 A 1/1999 Welles, II et al.
6,121,921 A 9/2000 Ishigaki
6,141,570 A * 10/2000 O'Neill, et al. 455/574
6,151,353 A 11/2000 Harrison et al.
6,191,587 B1 2/2001 Fox
6,298,229 B1 10/2001 Tomlinson, Jr. et al.
(Continued)
FOREIGN PATENT DOCUMENTS
GB 2,394,134 A 4/2004
JP H08327718 A 12/1996
(Continued)
OTHER PUBLICATIONS
"TricklePower" in Reference Guideline to TF GPS Engine Board by Laipec Technology, Inc. (2001) (<http://www.laipec.com/datasheets/gps/TF%20GPS%20Series.pdf>).
(Continued)
Primary Examiner—B. James Peikari

(57) **ABSTRACT**
A method, a mobile device [arid] 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.

9 Claims, 6 Drawing Sheets

FIELD OF THE INVENTION

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

Ex-1001 at Cover

'206 patent is a broadening reissue

US00RE48206E

(19) **United States**
 (12) **Reissued Patent**
 (10) **Patent Number:** **US RE48,206 E**
 (45) **Date of Reissued Patent:** ***Sep. 15, 2020**
 (54) **REDUCED POWER USE IN MOBILE GPS-BASED TECHNOLOGIES**
 (71) Applicant: **Robert Anderson Malaney, East Lindfield (AU)**
 (72) Inventor: **Robert Anderson Malaney, East Lindfield (AU)**
 (73) Assignee: **Robert Anderson Malaney, East Lindfield, NSW (AU)**
 (*) Notice: This patent is subject to a terminal disclaimer.
 (21) Appl. No.: **15/376,627**
 (22) Filed: **Dec. 12, 2016**
 (58) **Field of Classification Search**
 CPC: **G01S 19/34; G01S 19/24**
 USPC: **342/557.74**
 See application file for complete search history.
 (56) **References Cited**
 U.S. PATENT DOCUMENTS
 5,592,173 A * 1/1997 Lau et al. 342/357.12
 5,864,315 A 1/1999 Welles, II et al.
 6,121,921 A 9/2000 Ishigaki
 6,141,570 A * 10/2000 O'Neill et al. 455/574
 6,151,353 A 11/2000 Harrison et al.
 6,191,587 B1 2/2001 Fox
 6,298,229 B1 10/2001 Tomlinson, Jr. et al.
 (Continued)
 FOREIGN PATENT DOCUMENTS
 GB 2,394,134 A 4/2004
 JP H08327718 A 12/1996
 (Continued)
 OTHER PUBLICATIONS
 "TricklePower" in Reference Guideline to TF GPS Engine Board by Laisac Technology, Inc. (2001) (<http://www.laisac.com/datasheets/gps/TF%20GPS%20Series.pdf>).
 (Continued)
 Primary Examiner — B. James Peikari
 (64) Patent No.: **8,022,870**
 Issued: **Sep. 20, 2011**
 Appl. No.: **11/661,707**
 PCT Filed: **Aug. 31, 2005**
 PCT No.: **PCT/AU2005/001315**
 § 371 (c)(1),
 (2) Date: **Feb. 11, 2008**
 PCT Pub. No.: **WO2006/024112**
 PCT Pub. Date: **Mar. 9, 2006**
 (30) **Foreign Application Priority Data**
 Sep. 2, 2004 (AU) 2004905024
 (51) **Int. Cl.**
G01S 19/34 (2010.01)
G01S 19/42 (2010.01)
 (52) **U.S. Cl.**
CPC **G01S 19/34** (2013.01); **G01S 19/42** (2013.01)
9 Claims, 6 Drawing Sheets

(Amended)

I believe the original patent to be wholly or partly inoperative or invalid, for the reasons described below. (Check all boxes that apply.)

☐ by reason of a defective specification or drawing.

☒ by reason of the patentee claiming more or less than he had the right to claim in the patent.

☐ by reason of other errors.

At least one error upon which reissue is based is described below. If the reissue is a broadening reissue, a claim that the application seeks to broaden must be identified:

Original claim 1 specified a GPS system and not a satellite positioning system. A new claim 37 is added to current application that rectifies that point thus broadening the original scope of the invention. All new claims have a different allowed set of parameters used to make determinations on the controlling of power.

Ex-1001; Ex-1004 at 45

'206 patent's system: Parameters used to make determinations on the controlling of power

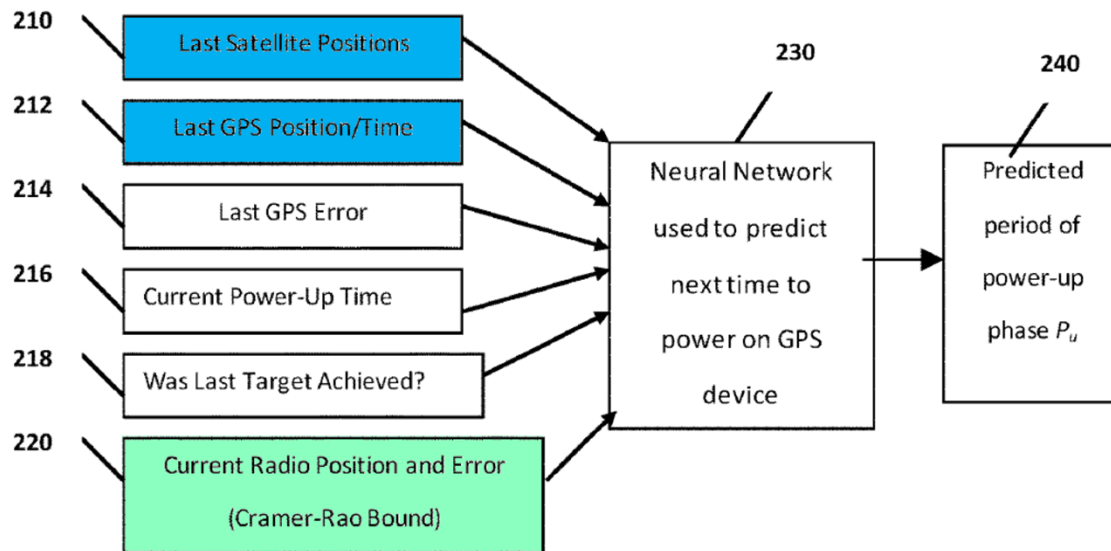


FIG. 2 (Amended)

Reissued claims not limited to, e.g., the
“neural network” adaptive prediction techniques

37. A method of acquiring a position on a mobile wireless communication device for a wireless communications network, said mobile wireless communication device possessing wireless communications capability for said wireless communications network and an embedded GPS module for GPS capability, said GPS referring to GPS-based techniques, said method comprising:

determining when said embedded GPS module should be powered on, said embedded GPS module then being powered on,

said when said embedded GPS module should be powered on being dependent on at least one of a current radio position and a position error of said mobile device determined from the wireless communications network, said wireless communications network being different from said GPS.

38. The method according to claim 37, wherein said powered on comprises said module powering up from a low-power mode such as a TricklePower power-down mode.

39. The method according to claim 37, wherein said determining when said embedded GPS module should be powered on is also dependent on at least one of; a last satellite position; a last position determined by the GPS; and a last time determined by the GPS.

Ex-1001 at Fig. 2 (annotated)

Overview

- Alleged Invention
- Overview of the Prior Art
- Claim construction issues
- Ground 1 – Obviousness over Watters
- Ground 2 – Obviousness over Nohara
- Ground 4 – Obviousness over Watters + Nohara
- Other issues and grounds

Watters

United States Patent [19] **Patent Number:** 5,982,324
Watters et al. [45] **Date of Patent:** Nov. 9, 1999

[54] **COMBINING GPS WITH TOA/TDOA OF CELLULAR SIGNALS TO LOCATE TERMINAL**

[75] **Inventors:** J. Michael Watters, Kanata; Leo Strawczynski, Ottawa; David G. Steer, Nepean, all of Canada

[73] **Assignee:** Nortel Networks Corporation, Montreal, Canada

[21] **Appl. No.:** 09/078,558

[22] **Filed:** May 14, 1998

[51] **Int. Cl.:** G01S 5/02; H04B 7/185

[52] **U.S. Cl.:** 342/357.06; 342/357.01; 701/213

[58] **Field of Search:** 342/357, 457; 701/213; 455/456

References Cited

U.S. PATENT DOCUMENTS

4,912,756 3/1990 Hop 155/54
 5,043,736 8/1991 Darnell et al. 342/357
 5,148,452 9/1992 Kennedy et al. 375/96
 5,223,844 6/1993 Mansell et al. 342/357
 5,271,034 12/1993 Abuozza 375/1
 5,396,540 3/1995 Gooch 379/59
 5,418,537 5/1995 Bid 342/357
 5,434,787 7/1995 Okamoto et al. 364/449
 5,467,282 11/1995 Dennis 364/449
 5,479,482 12/1995 Grimes 379/59
 5,497,339 3/1996 Bernard 364/705.05
 5,519,403 5/1996 Bickley et al. 342/352
 5,546,445 8/1996 Denison et al. 379/360
 5,576,716 11/1996 Sadler 342/357
 5,587,715 12/1996 Lewis 342/357
 5,604,765 2/1997 Bruno et al. 375/200
 5,625,668 4/1997 Loomis et al. 379/58
 5,646,630 7/1997 Sheynblat et al. 342/357
 5,663,734 9/1997 Krasner 342/357
 5,736,962 4/1998 Tendler 342/357

OTHER PUBLICATIONS

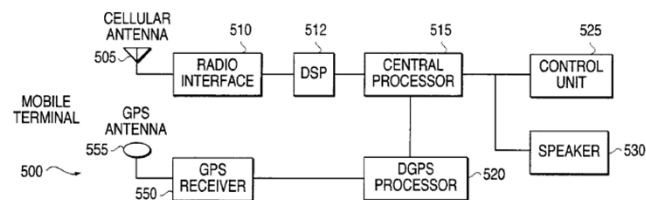
Krizman, et al., Wireless Position Location: Fundamentals, Implementation Strategies, and Sources of Error, presented at the IEEE Conference on Vehicular Technology, Phoenix, Arizona, May 5-7, 1997 and in the issue of the IEEE Communications Magazine, Apr. 1998, vol. 36, No. 4, pp. 30-59.

Primary Examiner—Thomas H. Tarcza
Assistant Examiner—Dao L. Phan
Attorney, Agent, or Firm—Foley & Lardner

ABSTRACT

Aspects of global positioning system (GPS) technology and cellular technology are combined in order to provide an effective and efficient position location system. In a first aspect of the invention, a cellular network is utilized to collect differential GPS error correction data, which is forwarded to a mobile terminal over the cellular network. The mobile terminal receives this data, along with GPS pseudoranges using a GPS receiver, and calculates its position using this information. According to a second aspect, when the requisite number of GPS satellites are not in view of the mobile terminal, then a GPS pseudosatellite signal, broadcast from a base station of the cellular network, is received by the mobile terminal and processed as a substitute for the missing GPS satellite signal. A third aspect involves calculating position using GPS when the requisite number of GPS satellites are in view of a GPS receiver, but when the requisite number of GPS satellites are not in view of the GPS receiver, then position is calculated using the cellular network infrastructure. When the requisite number of GPS satellites come back into view of the GPS receiver, then position is again calculated using GPS. A fourth aspect involves using cellular signals already being transmitted from base stations to terminals in a cellular network to calculate a round trip delay, from which a distance calculation between the base station and the terminal can be made. This distance calculation substitutes for a missing GPS satellite signal.

17 Claims, 11 Drawing Sheets



[57]

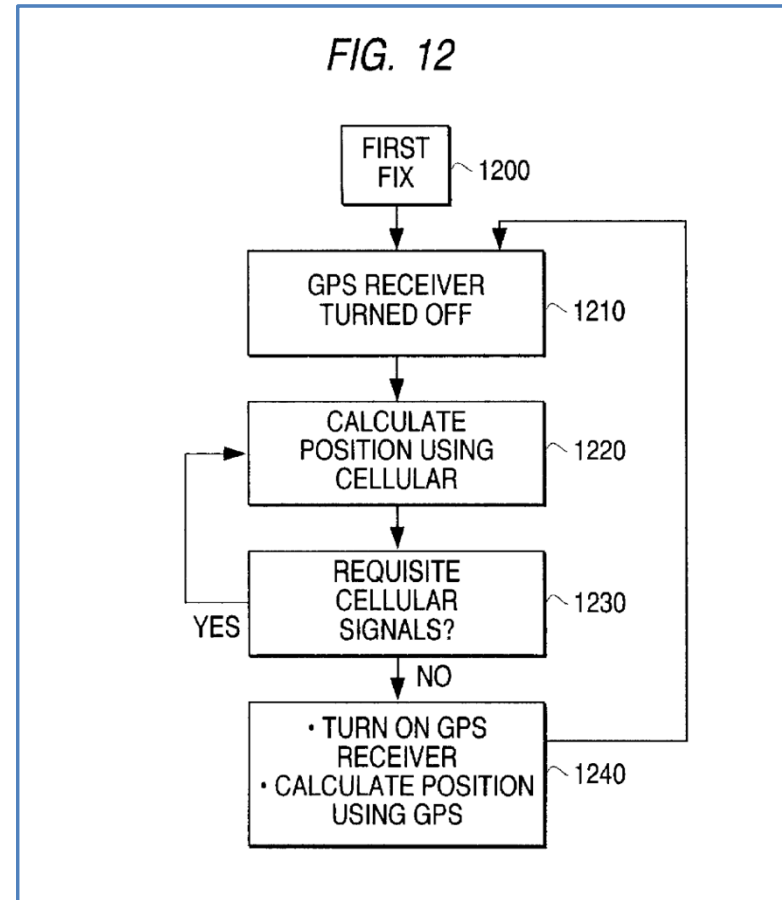
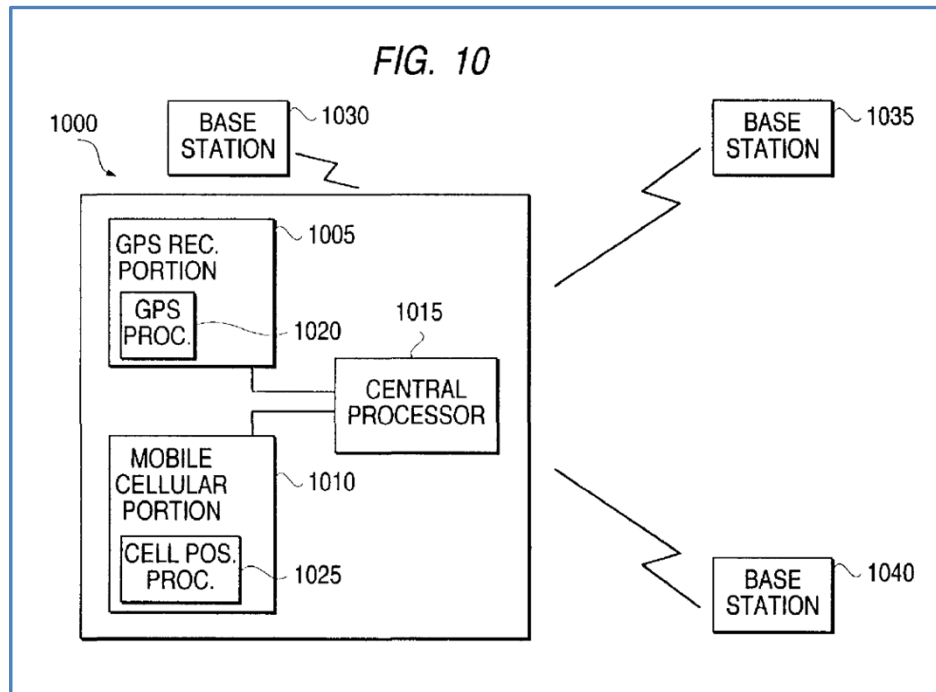
ABSTRACT

Aspects of global positioning system (GPS) technology and cellular technology are combined in order to provide an effective and efficient position location system. In a first

Demonstrative Exhibit Not Evidence

Ex-1005 at Cover, Abstract

Watters uses both GPS and cellular infrastructure to determine position, errors, and power on GPS



Nohara

US 2002/0151314 A1

(19) **United States**
 (12) **Patent Application Publication** (10) Pub. No.: **US 2002/0151314 A1**
 Nohara (43) Pub. Date: **Oct. 17, 2002**

(54) **POSITIONING APPARATUS, POSITIONING METHOD, AND POSITIONING SYSTEM**
 (75) Inventor: **Manabu Nohara, Saitama-ken (JP)**
 Correspondence Address:
ARENT FOX KINTNER PLOTKIN & KAHN, PLLC
Suite 600
1050 Connecticut Avenue, N.W.
Washington, DC 20036-5339 (US)
 (73) Assignee: **Pioneer Corporation**
 (21) Appl. No.: **10/083,292**
 (22) Filed: **Feb. 27, 2002**
 (30) **Foreign Application Priority Data**
 Feb. 27, 2001 (JP) 2001-51476

Publication Classification

(51) Int. Cl.⁷ **H04Q 7/20**
 (52) U.S. Cl. **455/456, 455/459**
 (57) **ABSTRACT**
 A positioning apparatus for determining a present position of a mobile station by using radio waves coming from a plurality of base stations arranged within a communication area is provided. The positioning apparatus receives the radio waves coming from the plurality of base stations to generate reception signals corresponding to the respective radio waves, and determines propagation ranges of the radio waves coming from the respective base stations. The apparatus further derives propagation ranges of direct waves coming from the respective base stations from the determined propagation ranges. Then, the present position of the mobile station is determined by performing positioning operation using the derived propagation ranges of the direct waves.

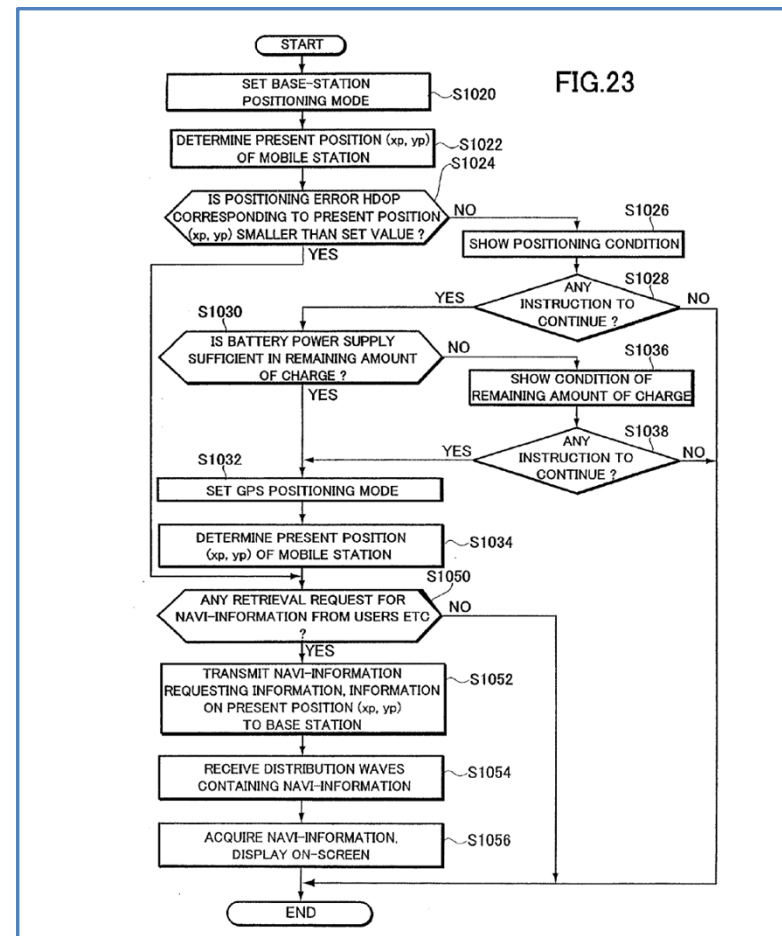
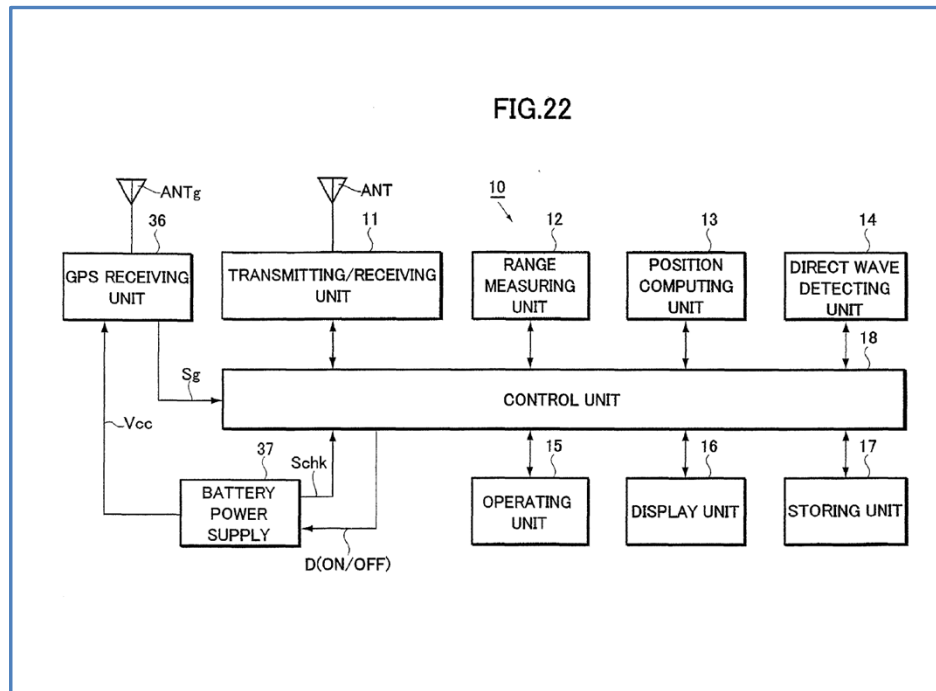
[0036] In the foregoing positioning apparatus, method, and system for determining the present position of a mobile station by using radio waves coming from the mobile station to a plurality of base stations, positioning means for determining the present position of the mobile station by using the GPS are provided on the mobile-station side, so as to switch to the positioning by the GPS positioning means in cases where the result of the positioning based on the communication waves among the base stations and the mobile station exceeds a predetermined positioning error.

Demonstrative Exhibit Not Evidence

Ex-1006 at Cover, ¶136

10

Nohara uses both GPS and cellular infrastructure to determine position, errors, and power on GPS



Demonstrative Exhibit Not Evidence

Ex-1006 at Figs. 22 and 23, cited at Pet. (Paper 1) at 16, 17

Overview

- Alleged Invention
- Overview of the Prior Art
- Claim construction issues
- Ground 1 – Obviousness over Watters
- Ground 2 – Obviousness over Nohara
- Ground 4 – Obviousness over Watters + Nohara
- Other issues and grounds

“at least one of a current radio position and a position error of said mobile device”

37. A method of acquiring a position on a mobile wireless communication device for a wireless communications network, said mobile wireless communication device possessing wireless communications capability for said wireless communications network and an embedded GPS module for GPS capability, said GPS referring to GPS-based techniques, said method comprising:

determining when said embedded GPS module should be powered on, said embedded GPS module then being powered on,

said when said embedded GPS module should be powered on being dependent on at least one of a current radio position and a position error of said mobile device determined from the wireless communications network, said wireless communications network being different from said GPS.

Petition:

In the underlying litigation, Patent Owner argues that this term should be interpreted “disjunctively,” such that “at least one of a current radio position and a position error of said mobile device” means at least one of either “current radio position” or “position error.” See Ex-1021, 0004. In the context of the surrounding claim language, such as Claim 37’s recitation of “said embedded GPS module should be powered on being dependent on at least one of a current radio position and a position error of said mobile device,” a disjunctive interpretation means that the GPS’s power on state can depend on either quantity: current radio position or position error.

Both the “conjunctive” and “disjunctive” view are addressed in Petition

“at least one of a current radio position and a position error of said mobile device”

37. A method of acquiring a position on a mobile wireless communication device for a wireless communications network, said mobile wireless communication device possessing wireless communications capability for said wireless communications network and an embedded GPS module for GPS capability, said GPS referring to GPS-based techniques, said method comprising:

determining when said embedded GPS module should be powered on, said embedded GPS module then being powered on,

said when said embedded GPS module should be powered on being dependent on at least one of a current radio position and a position error of said mobile device determined from the wireless communications network, said wireless communications network being different from said GPS.

Patent Owner Response:

B. Claims 37, 40, and 43: “at least one of a current radio position and a position error of said mobile device”

Petitioner argues that this term may be interpreted “disjunctively” or “conjunctively.” Pet. at 11-12. Patent Owner believes this term should be interpreted according to the “disjunctive” interpretation provided by the Petition.

**Patent Owner adopts the “disjunctive” view:
only one of “position” or “position error” is required**

No dispute as to the “means” terms

Petition:

Function	Corresponding Structure
“determining when said embedded GPS module should be powered on, said embedded GPS module then being powered on dependent on at least one of a current radio position and a position error of said mobile device determined from the wireless communications network, said wireless communications network being different from said GPS”	CPU or other processing unit programmed with a thresholding algorithm to determine when to power on said embedded GPS module based on comparing at least one of a position and position error to one or more thresholds, and equivalents

Patent Owner Response:

A. Claim 40: “means for determining when said embedded GPS module should be powered on, said embedded GPS module then being powered on dependent on at least one of a current radio position and a position error of said mobile device determined from the wireless communications network, said wireless communications network being different from said GPS”

Patent Owner does not dispute Petitioners’ identified recited function and corresponding structure for this term. Pet. at 8-11.

Patent Owner proposes to also construe: “a position error of said mobile device determined from the wireless communications network”

37. A method of acquiring a position on a mobile wireless communication device for a wireless communications network, said mobile wireless communication device possessing wireless communications capability for said wireless communications network and an embedded GPS module for GPS capability, said GPS referring to GPS-based techniques, said method comprising:

determining when said embedded GPS module should be powered on, said embedded GPS module then being powered on,

said when said embedded GPS module should be powered on being dependent on at least one of a current radio position and a position error of said mobile device determined from the wireless communications network, said wireless communications network being different from said GPS.

Patent Owner Response:

Patent owner believes the term “position error” should be given its plain and ordinary meaning, that is a measurement of error measured in units of distance. The

Claims 37, 40, and 43 also require that position error is “determined from the wireless communications network.” A POSITA would understand that such a determination involves a calculation of the position error. *Id.* at ¶24. And that a mere

“Position error” is broad enough to include specification example

'206 Patent:

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

Petitioner Reply:

claims. Nevertheless, Petitioner generally agrees that a “position error” is *at least broad enough* to include “error between the predicted position of the mobile device and that of the actual position.” Ex-1042 ¶12. This does not, however, support PO’s position that a “position error” *must* include “a measurement” or that it be “measured in units of distance.” Indeed, there is no basis to read the claims so narrowly. The phrase “measurement of error measured in units of distance” appears nowhere in the intrinsic record. Moreover, the word “distance” is not

No basis to limit “position error” as Patent Owner proposes

- Position error may be determined in any number of ways, not limited to specific measurements or calculations
 - statistics (e.g. error bars, histograms, distribution models)
 - estimates/approximations
 - characterizations (good/bad, high/low)
 - *See, e.g., Pullen Deposition, Ex-1043, 24:5-28:2, 37:4-38:4*
- Position error is not limited to particular units
 - Meters
 - Angular units (degrees, radians)
 - Geographic coordinates (lat/long)
 - *See, e.g., Pullen Deposition, Ex-1043, 33:2-35:9*
- Position error is not limited to being expressed or calculated with distance
 - Percentage
 - Confidence level
 - *See, e.g., Pullen Deposition, Ex-1043, 108:12-110:2*

No need to construe the “position error” term to resolve the patentability issues

- Under the “disjunctive” view, the claim is met by using only “position” without also using “position error”
 - Taught as explained in Ground 1, based on Watters alone
- Both Waters and Nohara teach or suggest a “position error” with units of distance, so the proposed construction does not avoid the prior art in any event

The prior art teaches the claims under any of the advanced constructions

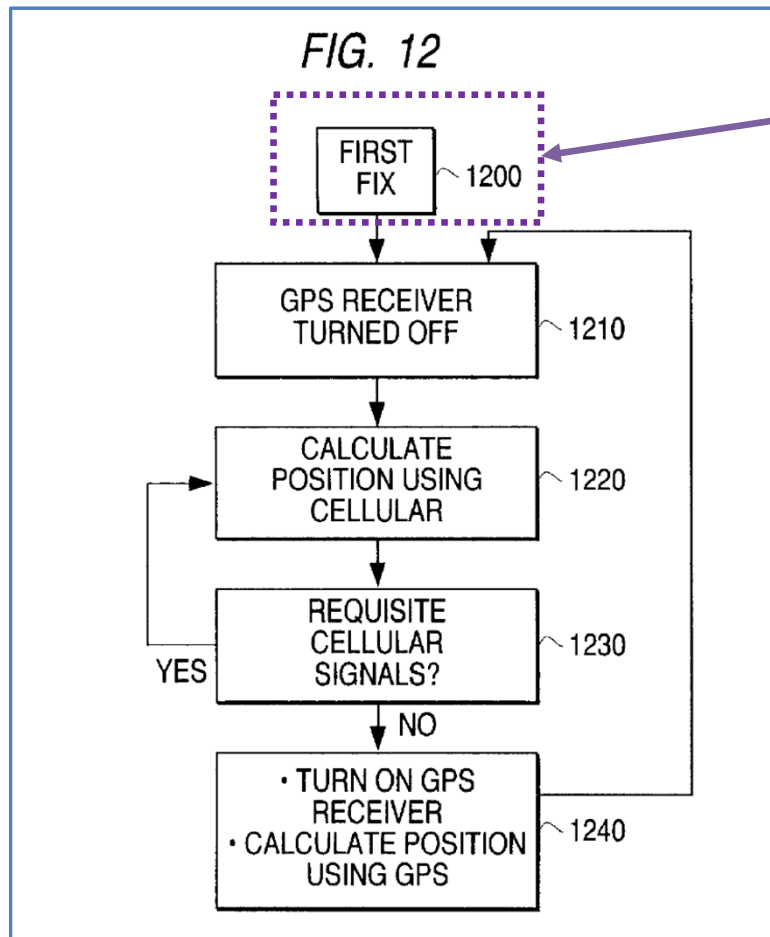
<u>Claim Term</u>	<u>"disjunctive"</u>		<u>"conjunctive"</u>
	<u>Watters</u>	<u>Nohara</u>	<u>Watters+Nohara</u>
"position" used to power on GPS	✓		✓
"position error" used to power on GPS	✓	✓	
specific "position error" calculation used to power on GPS, under PO's proposed construction		✓	

Green checkmark indicates independent teachings sufficient to invalidate claims

Overview

- Alleged Invention
- Overview of the Prior Art
- Claim construction issues
- **Ground 1 – Obviousness over Watters**
- Ground 2 – Obviousness over Nohara
- Ground 4 – Obviousness over Watters + Nohara
- Other issues and grounds

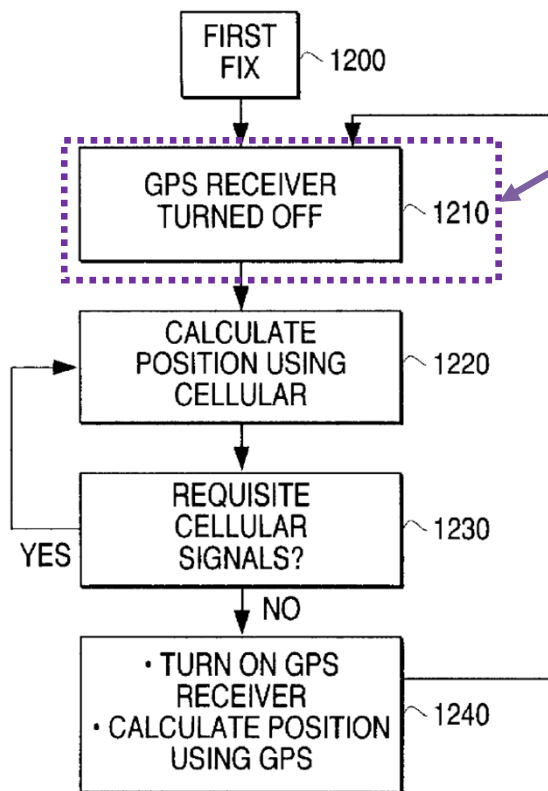
Watters' use of current radio position to turn on GPS: Step 1 – GPS first fix



The alternative approach is shown in FIG. 12. At block 1200, a first fix is calculated. Then, at block 1210, the GPS receiver is turned off, and at block 1220, position is calculated using the cellular network infrastructure. At block 1230, a determination is made whether the requisite number of signals in the cellular network infrastructure are available for calculating position (e.g., three signals in the TDOA approach). If so, then block 1220 is repeated. If not, then at block 1240, the GPS receiver is turned on and the position is calculated using GPS. Thereafter, the process is repeated starting at block 1210. Alternative inquiries at block 1230 include determining how long (in time) it has been since the last GPS update and/or how far (in space) the mobile terminal has moved since the last GPS update. If a predetermined amount of time has passed, such as two minutes, or the mobile terminal has moved a predetermined distance, such as 100 meters, then a GPS update would be called for and the process proceeds to block 1240. Of course, the rate at which GPS updates are needed will depend on the conditions under which the mobile is operating, with less frequent updates needed if the mobile terminal is in an area where the cellular network infrastructure signals are known to be of good accuracy.

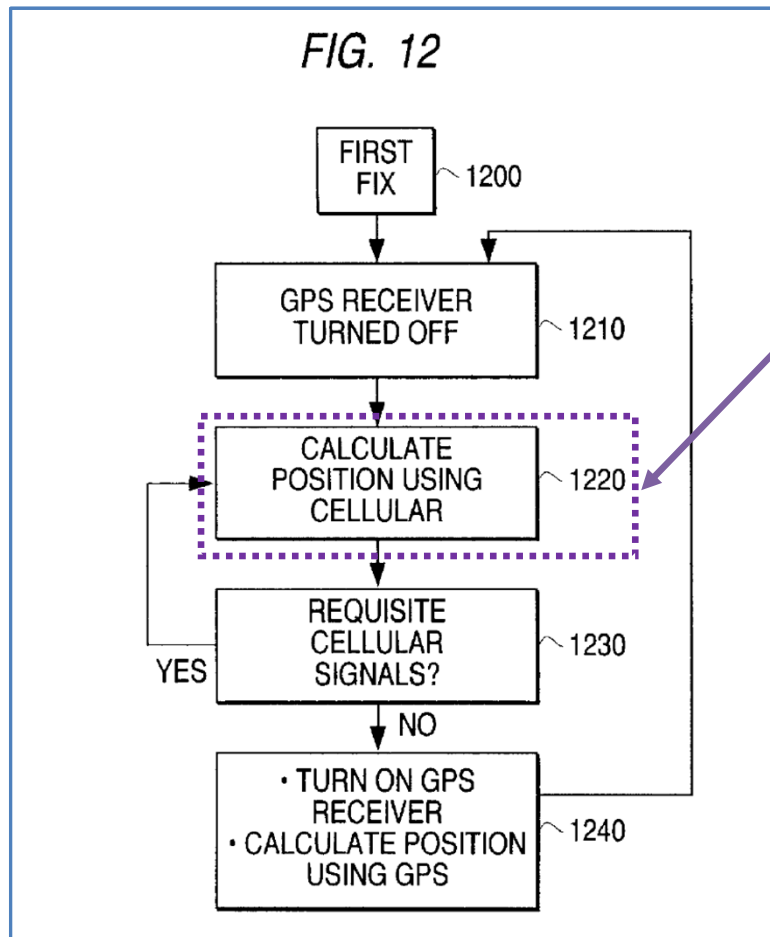
Watters' use of current radio position to turn on GPS: Step 2 – GPS turned off

FIG. 12



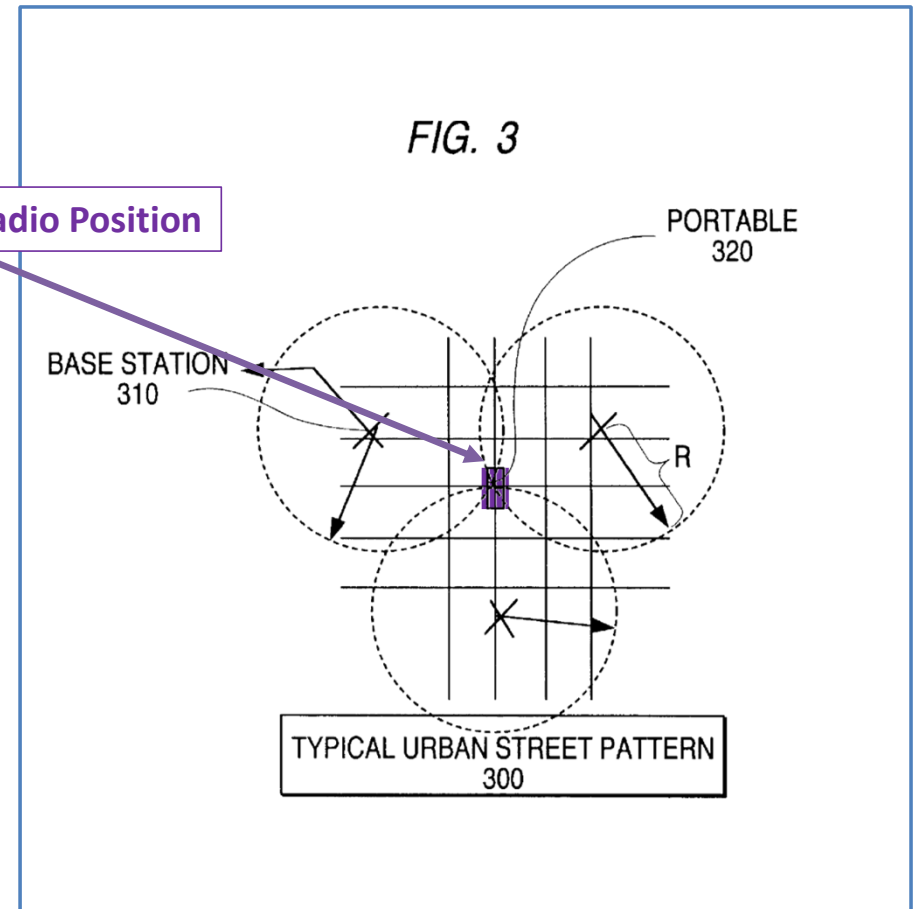
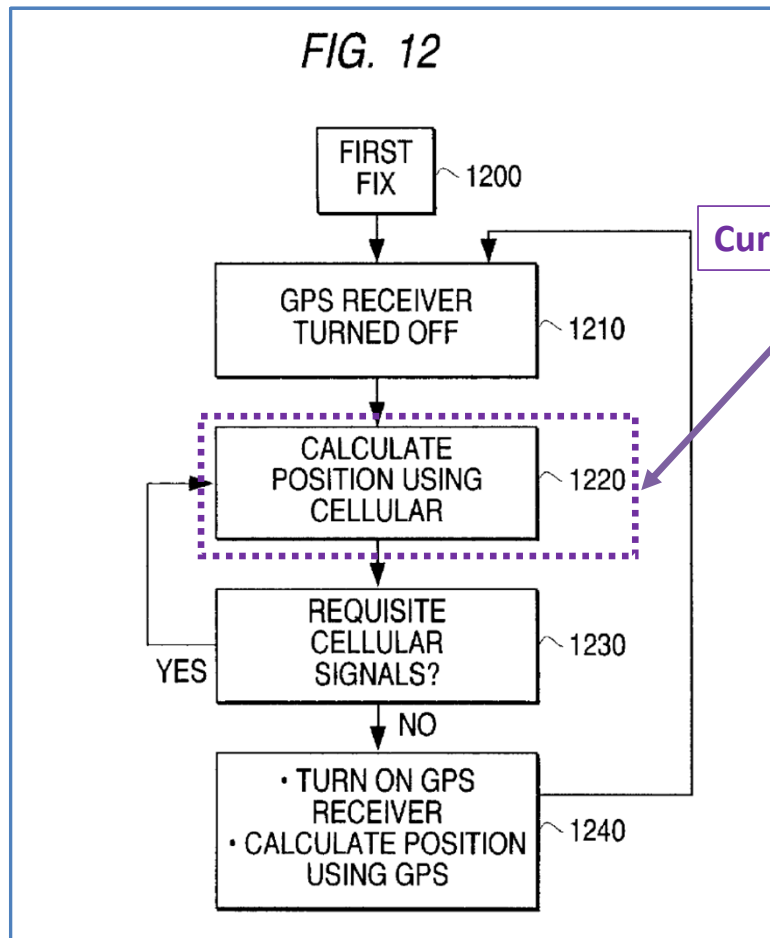
The alternative approach is shown in FIG. 12. At block 1200, a first fix is calculated. Then, at block 1210, the GPS receiver is turned off, and at block 1220, position is calculated using the cellular network infrastructure. At block 1230, a determination is made whether the requisite number of signals in the cellular network infrastructure are available for calculating position (e.g., three signals in the TDOA approach). If so, then block 1220 is repeated. If not, then at block 1240, the GPS receiver is turned on and the position is calculated using GPS. Thereafter, the process is repeated starting at block 1210. Alternative inquiries at block 1230 include determining how long (in time) it has been since the last GPS update and/or how far (in space) the mobile terminal has moved since the last GPS update. If a predetermined amount of time has passed, such as two minutes, or the mobile terminal has moved a predetermined distance, such as 100 meters, then a GPS update would be called for and the process proceeds to block 1240. Of course, the rate at which GPS updates are needed will depend on the conditions under which the mobile is operating, with less frequent updates needed if the mobile terminal is in an area where the cellular network infrastructure signals are known to be of good accuracy.

Watters' use of current radio position to turn on GPS: Step 3 – Current radio position determined



The alternative approach is shown in FIG. 12. At block 1200, a first fix is calculated. Then, at block 1210, the GPS receiver is turned off, and at block 1220, position is calculated using the cellular network infrastructure. At block 1230, a determination is made whether the requisite number of signals in the cellular network infrastructure are available for calculating position (e.g., three signals in the TDOA approach). If so, then block 1220 is repeated. If not, then at block 1240, the GPS receiver is turned on and the position is calculated using GPS. Thereafter, the process is repeated starting at block 1210. Alternative inquiries at block 1230 include determining how long (in time) it has been since the last GPS update and/or how far (in space) the mobile terminal has moved since the last GPS update. If a predetermined amount of time has passed, such as two minutes, or the mobile terminal has moved a predetermined distance, such as 100 meters, then a GPS update would be called for and the process proceeds to block 1240. Of course, the rate at which GPS updates are needed will depend on the conditions under which the mobile is operating, with less frequent updates needed if the mobile terminal is in an area where the cellular network infrastructure signals are known to be of good accuracy.

Watters' use of current radio position to turn on GPS: Step 3 – Current radio position determined

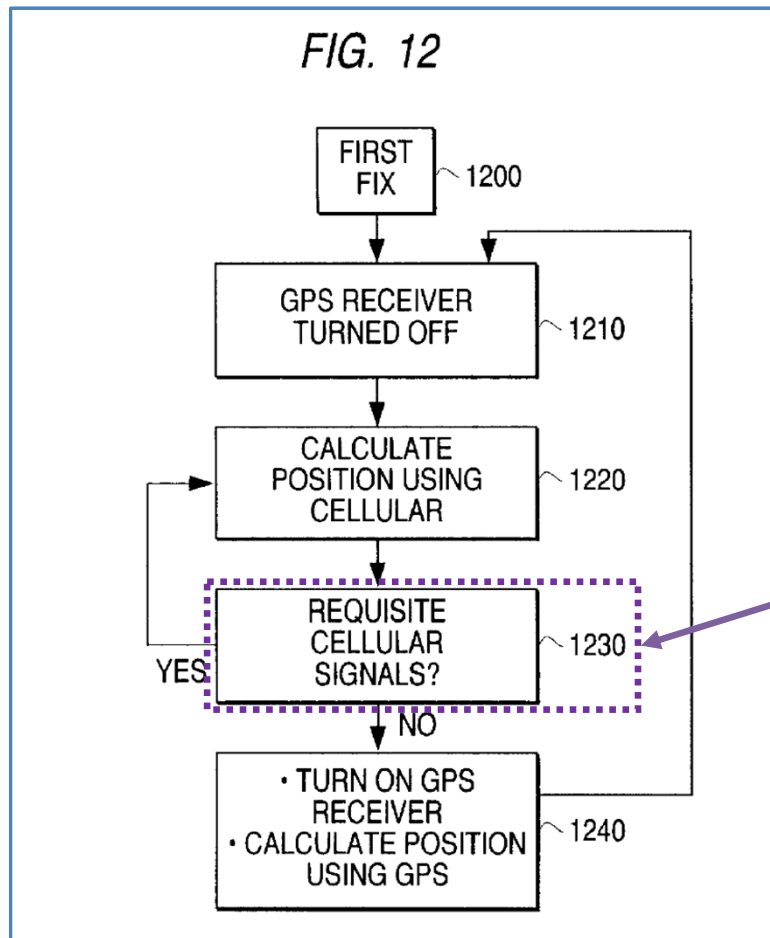


Demonstrative Exhibit Not Evidence

Ex-1005 at Figs. 3 and 12, 22:47-23:2

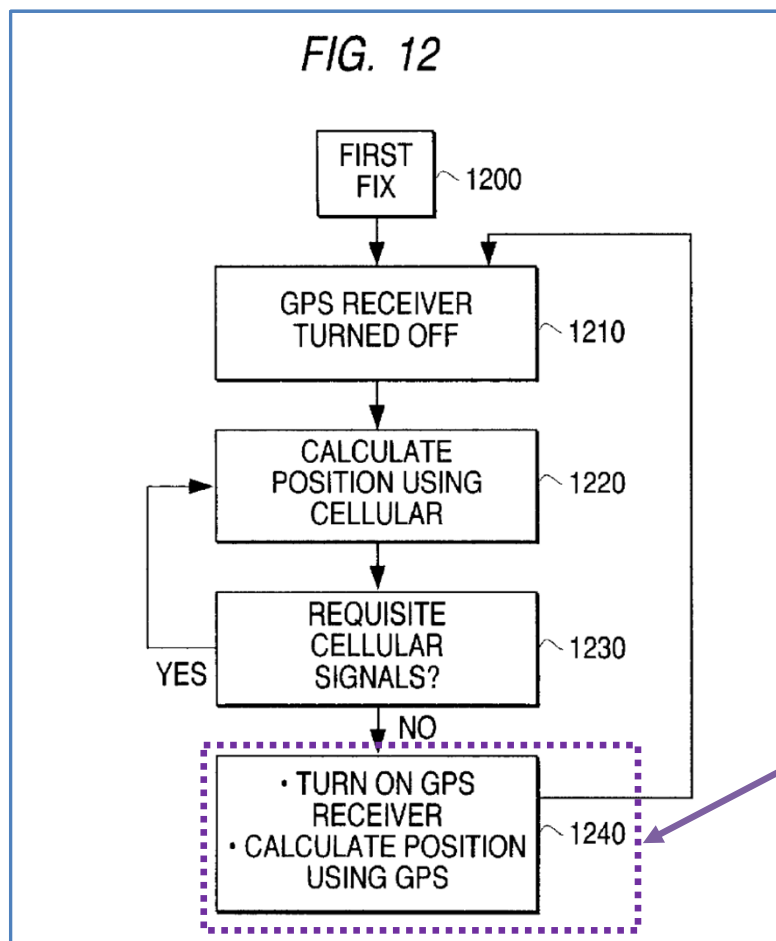
25

Watters' use of current radio position to turn on GPS: Step 4 – Alternative inquiry: How far has the device travelled since first fix?



The alternative approach is shown in FIG. 12. At block 1200, a first fix is calculated. Then, at block 1210, the GPS receiver is turned off, and at block 1220, position is calculated using the cellular network infrastructure. At block 1230, a determination is made whether the requisite number of signals in the cellular network infrastructure are available for calculating position (e.g., three signals in the TDOA approach). If so, then block 1220 is repeated. If not, then at block 1240, the GPS receiver is turned on and the position is calculated using GPS. Thereafter, the process is repeated starting at block 1210. Alternative inquiries at block 1230 include determining how long (in time) it has been since the last GPS update and/or how far (in space) the mobile terminal has moved since the last GPS update. If a predetermined amount of time has passed, such as two minutes, or the mobile terminal has moved a predetermined distance, such as 100 meters, then a GPS update would be called for and the process proceeds to block 1240. Of course, the rate at which GPS updates are needed will depend on the conditions under which the mobile is operating, with less frequent updates needed if the mobile terminal is in an area where the cellular network infrastructure signals are known to be of good accuracy.

Watters' use of current radio position to turn on GPS: Step 5 – Alternative inquiry: 100-meter threshold exceeded so turn on GPS



The alternative approach is shown in FIG. 12. At block 1200, a first fix is calculated. Then, at block 1210, the GPS receiver is turned off, and at block 1220, position is calculated using the cellular network infrastructure. At block 1230, a determination is made whether the requisite number of signals in the cellular network infrastructure are available for calculating position (e.g., three signals in the TDOA approach). If so, then block 1220 is repeated. If not, then at block 1240, the GPS receiver is turned on and the position is calculated using GPS. Thereafter, the process is repeated starting at block 1210. Alternative inquiries at block 1230 include determining how long (in time) it has been since the last GPS update and/or how far (in space) the mobile terminal has moved since the last GPS update. If a predetermined amount of time has passed, such as two minutes, or the mobile terminal has moved a predetermined distance, such as 100 meters, then a GPS update would be called for and the process proceeds to block 1240. Of course, the rate at which GPS updates are needed will depend on the conditions under which the mobile is operating, with less frequent updates needed if the mobile terminal is in an area where the cellular network infrastructure signals are known to be of good accuracy.

Watters' use of current radio position to turn on GPS: Determining whether the mobile terminal has moved 100 meters

The alternative approach is shown in FIG. 12. At block 1200, a first fix is calculated. Then, at block 1210, the GPS receiver is turned off, and at block 1220, position is calculated using the cellular network infrastructure. At block 1230, a determination is made whether the requisite number of signals in the cellular network infrastructure are available for calculating position (e.g., three signals in the TDOA approach). If so, then block 1220 is repeated. If not, then at block 1240, the GPS receiver is turned on and the position is calculated using GPS. Thereafter, the process is repeated starting at block 1210. Alternative inquiries at block 1230 include determining how long (in time) it has been since the last GPS update and/or how far (in space) the mobile terminal has moved since the last GPS update. If a predetermined amount of time has passed, such as two minutes, or the mobile terminal has moved a predetermined distance, such as 100 meters, then a GPS update would be called for and the process proceeds to block 1240. Of course, the rate at which GPS updates are needed will depend on the conditions under which the mobile is operating, with less frequent updates needed if the mobile terminal is in an area where the cellular network infrastructure signals are known to be of good accuracy.

Petitioner's Expert, Mr. Andrews:

position of the device determined by the cellular network. Watters explains that GPS is used “[i]f a predetermined amount of time has passed, such as two minutes, or the mobile terminal has moved a predetermined distance, such as 100 meters[.]” *Id.*, 22:61-63. Similarly, determining the travel distance of a device is done by comparing the starting position (based on GPS) and the current position (based on cellular). Thus, Watters compares the current radio position determined from cellular sources using TOA to the previous GPS fix and, if that distance exceeds a threshold (e.g., 100 meters), turns the GPS back on to obtain a new fix.

Watters' use of current radio position to turn on GPS: Determining whether the mobile terminal has moved 100 meters

The alternative approach is shown in FIG. 12. At block 1200, a first fix is calculated. Then, at block 1210, the GPS receiver is turned off, and at block 1220, position is calculated using the cellular network infrastructure. At block 1230, a determination is made whether the requisite number of signals in the cellular network infrastructure are available for calculating position (e.g., three signals in the TDOA approach). If so, then block 1220 is repeated. If not, then at block 1240, the GPS receiver is turned on and the position is calculated using GPS. Thereafter, the process is repeated starting at block 1210. Alternative inquiries at block 1230 include determining how long (in time) it has been since the last GPS update and/or how far (in space) the mobile terminal has moved since the last GPS update. If a predetermined amount of time has passed, such as two minutes, or the mobile terminal has moved a predetermined distance, such as 100 meters, then a GPS update would be called for and the process proceeds to block 1240. Of course, the rate at which GPS updates are needed will depend on the conditions under which the mobile is operating, with less frequent updates needed if the mobile terminal is in an area where the cellular network infrastructure signals are known to be of good accuracy.

Patent Owner's Expert, Dr. Pullen:

Q: One way to determine the difference between a position calculated at Block 1220 using cellular and a first fix calculated at Block 1200 using GPS would be simple subtraction; right?

A. Subtracting the cellular position at 1220 from the cellular -- from the GPS -- in this case, the assumed GPS position at 1210 -- would give you an estimate of the distance between the two fixes, the two positions.

Watters' use of current radio position to turn on GPS: Determining whether the mobile terminal has moved 100 meters

The alternative approach is shown in FIG. 12. At block 1200, a first fix is calculated. Then, at block 1210, the GPS receiver is turned off, and at block 1220, position is calculated using the cellular network infrastructure. At block 1230, a determination is made whether the requisite number of signals in the cellular network infrastructure are available for calculating position (e.g., three signals in the TDOA approach). If so, then block 1220 is repeated. If not, then at block 1240, the GPS receiver is turned on and the position is calculated using GPS. Thereafter, the process is repeated starting at block 1210. Alternative inquiries at block 1230 include determining how long (in time) it has been since the last GPS update and/or how far (in space) the mobile terminal has moved since the last GPS update. If a predetermined amount of time has passed, such as two minutes, or the mobile terminal has moved a predetermined distance, such as 100 meters, then a GPS update would be called for and the process proceeds to block 1240. Of course, the rate at which GPS updates are needed will depend on the conditions under which the mobile is operating, with less frequent updates needed if the mobile terminal is in an area where the cellular network infrastructure signals are known to be of good accuracy.

Patent Owner's Expert, Dr. Pullen:

Q. The method we just described of subtracting the GPS location from the location determined by cellular could be used to determine how far in space the mobile terminal has moved since the last GPS update?

A. Yes. It would be an estimate of that distance.

Patent Owner's argument that there are many ways to calculate distance does not lessen obviousness

Patent Owner Surreply:

Petitioners argue that use of position is obvious to calculate distance. Reply at 8. However, as explained in Patent Owner's response and by Patent Owner's expert, Dr. Pullen, there are many ways to calculate a distance, such as measuring doppler shifts of signals or using internal accelerometer data. Ex. 2001 ¶¶33-37. These methods each have their own advantages compared to using "a current radio position . . . determined from the wireless communications network." For example, Doppler

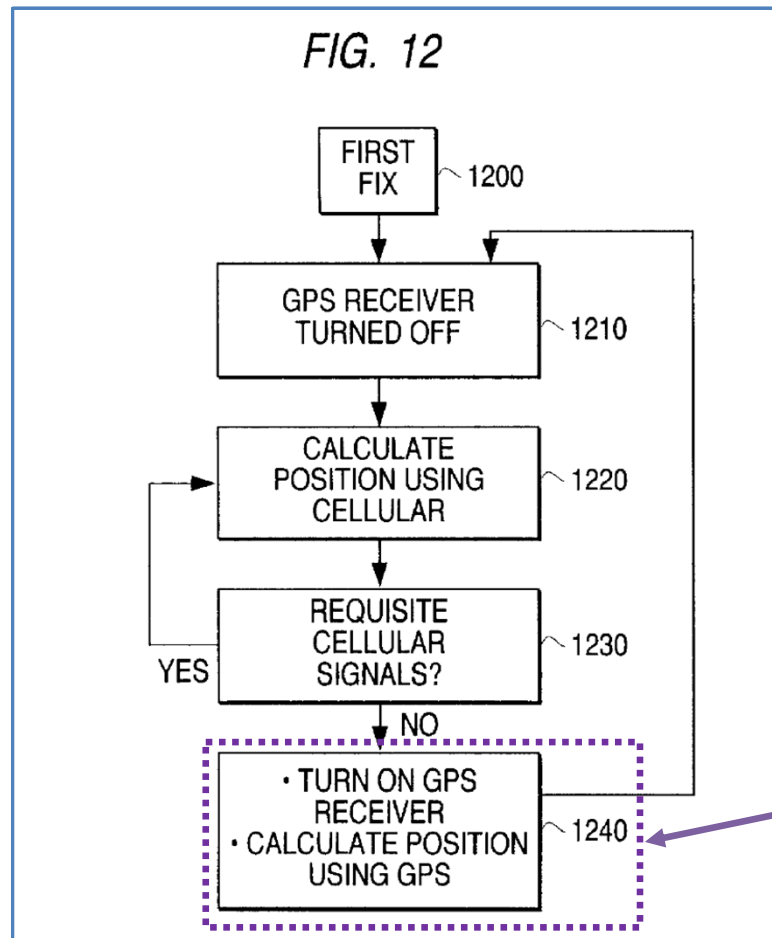
That there are many obvious ways to calculate distance known to a POSITA does not diminish Watters' teachings

Watters alone teaches the claims with its use of position to turn on GPS

	“disjunctive”		“conjunctive”
<u>Claim Term</u>	<u>Watters</u>	<u>Nohara</u>	<u>Watters+Nohara</u>
“position” used to power on GPS			
“position error” used to power on GPS			
specific “position error” calculation used to power on GPS, under PO’s proposed construction			

Watters alone satisfies the claims based on its use of a current radio position without needing to reach any of the other arguments or grounds

Watters' use of position error to turn on GPS: Step 6 – Additional teaching: update frequency based on signal “accuracy”



The alternative approach is shown in FIG. 12. At block 1200, a first fix is calculated. Then, at block 1210, the GPS receiver is turned off, and at block 1220, position is calculated using the cellular network infrastructure. At block 1230, a determination is made whether the requisite number of signals in the cellular network infrastructure are available for calculating position (e.g., three signals in the TDOA approach). If so, then block 1220 is repeated. If not, then at block 1240, the GPS receiver is turned on and the position is calculated using GPS. Thereafter, the process is repeated starting at block 1210. Alternative inquiries at block 1230 include determining how long (in time) it has been since the last GPS update and/or how far (in space) the mobile terminal has moved since the last GPS update. If a predetermined amount of time has passed, such as two minutes, or the mobile terminal has moved a predetermined distance, such as 100 meters, then a GPS update would be called for and the process proceeds to block 1240. Of course, the rate at which GPS updates are needed will depend on the conditions under which the mobile is operating, with less frequent updates needed if the mobile terminal is in an area where the cellular network infrastructure signals are known to be of good accuracy.

Watters' use of position error to turn on GPS: Multi-path signal propagation errors cause positional inaccuracy

The alternative approach is shown in FIG. 12. At block 1200, a first fix is calculated. Then, at block 1210, the GPS receiver is turned off, and at block 1220, position is calculated using the cellular network infrastructure. At block 1230, a determination is made whether the requisite number of signals in the cellular network infrastructure are available for calculating position (e.g., three signals in the TDOA approach). If so, then block 1220 is repeated. If not, then at block 1240, the GPS receiver is turned on and the position is calculated using GPS. Thereafter, the process is repeated starting at block 1210. Alternative inquiries at block 1230 include determining how long (in time) it has been since the last GPS update and/or how far (in space) the mobile terminal has moved since the last GPS update. If a predetermined amount of time has passed, such as two minutes, or the mobile terminal has moved a predetermined distance, such as 100 meters, then a GPS update would be called for and the process proceeds to block 1240. Of course, the rate at which GPS updates are needed will depend on the conditions under which the mobile is operating, with less frequent updates needed if the mobile terminal is in an area where the cellular network infrastructure signals are known to be of good accuracy.

However, problems exist with using these two methods for determining location. One significant problem results from multi-path errors. Such errors result from changes in the transmission path of the signal that the mobile terminal receives from the base station. For example, when the user of the mobile terminal goes around a corner, the mobile terminal may receive a new signal from the base station that has followed a completely different transmission path compared to the old signal that the mobile terminal was previously receiving before the user turned the corner. Therefore, the distance traveled by the signal will likely differ. This causes a change in time measurement by the mobile terminal that does not accurately represent the actual distance change of the mobile terminal from the base station, thereby rendering an inaccurate location determination by the mobile terminal.

**Multipath propagation causes error between
calculated position and actual position**

Watters' use of position error to turn on GPS: Watters teaches multipath propagation errors of about 150 meters

The alternative approach is shown in FIG. 12. At block 1200, a first fix is calculated. Then, at block 1210, the GPS receiver is turned off, and at block 1220, position is calculated using the cellular network infrastructure. At block 1230, a determination is made whether the requisite number of signals in the cellular network infrastructure are available for calculating position (e.g., three signals in the TDOA approach). If so, then block 1220 is repeated. If not, then at block 1240, the GPS receiver is turned on and the position is calculated using GPS. Thereafter, the process is repeated starting at block 1210. Alternative inquiries at block 1230 include determining how long (in time) it has been since the last GPS update and/or how far (in space) the mobile terminal has moved since the last GPS update. If a predetermined amount of time has passed, such as two minutes, or the mobile terminal has moved a predetermined distance, such as 100 meters, then a GPS update would be called for and the process proceeds to block 1240. Of course, the rate at which GPS updates are needed will depend on the conditions under which the mobile is operating, with less frequent updates needed if the mobile terminal is in an area where the cellular network infrastructure signals are known to be of good accuracy.

However, errors are present in the above position estimate, largely due to the terminal's internal delays and multi-path propagation. While the uncertainty is generally less than 1 microsecond, this translates into an uncertainty in distance of about 150 meters.

Watters teaches position errors expressed in units of distance

Watters' use of position error to turn on GPS: A POSITA would have understood Watters' position error teachings

The alternative approach is shown in FIG. 12. At block 1200, a first fix is calculated. Then, at block 1210, the GPS receiver is turned off, and at block 1220, position is calculated using the cellular network infrastructure. At block 1230, a determination is made whether the requisite number of signals in the cellular network infrastructure are available for calculating position (e.g., three signals in the TDOA approach). If so, then block 1220 is repeated. If not, then at block 1240, the GPS receiver is turned on and the position is calculated using GPS. Thereafter, the process is repeated starting at block 1210. Alternative inquiries at block 1230 include determining how long (in time) it has been since the last GPS update and/or how far (in space) the mobile terminal has moved since the last GPS update. If a predetermined amount of time has passed, such as two minutes, or the mobile terminal has moved a predetermined distance, such as 100 meters, then a GPS update would be called for and the process proceeds to block 1240. Of course, the rate at which GPS updates are needed will depend on the conditions under which the mobile is operating, with less frequent updates needed if the mobile terminal is in an area where the cellular network infrastructure signals are known to be of good accuracy.

Petitioner's Expert, Mr. Andrews:

111. Moreover a signal with "good accuracy" leads to low positioning errors, while a signal of "poor accuracy" leads to relatively larger positioning errors. Specifically, a weak signal may indicate a multipath propagation, which would result in higher positioning errors in a TOA calculation. As I explain in my technology background, ¶¶60-63, multipath propagation was well-known signal propagation problem. For example, I discuss Ex-1030, which describes that multipath delays often result in resolution of the time of arrival being ambiguous and lead to poor accuracy. Watters's "more frequent updates" thus would have been implemented when signals were of lower accuracy, resulting in correspondingly larger positioning errors. For example, a positional error caused

Patent Owner against Watters' specific teaching

Patent Owner Surreply:

Watters does not teach “accounting for multipath position errors by requiring more or less frequent updates depending on whether the signals have ‘good accuracy’” as argued by Petitioners. Reply at 13. All Watters teaches is that error exists and that some “signals” have better accuracy than other according to Watters. Watters does

FALSE

Watters 22:64-23:2:

and the process proceeds to block 1240. Of course, the rate at which GPS updates are needed will depend on the conditions under which the mobile is operating, with less frequent updates needed if the mobile terminal is in an area where the cellular network infrastructure signals are known to be of good accuracy.

Watters teaches that update frequency can be based on accuracy

Watters alone teaches the claims with its use of position error to turn on GPS

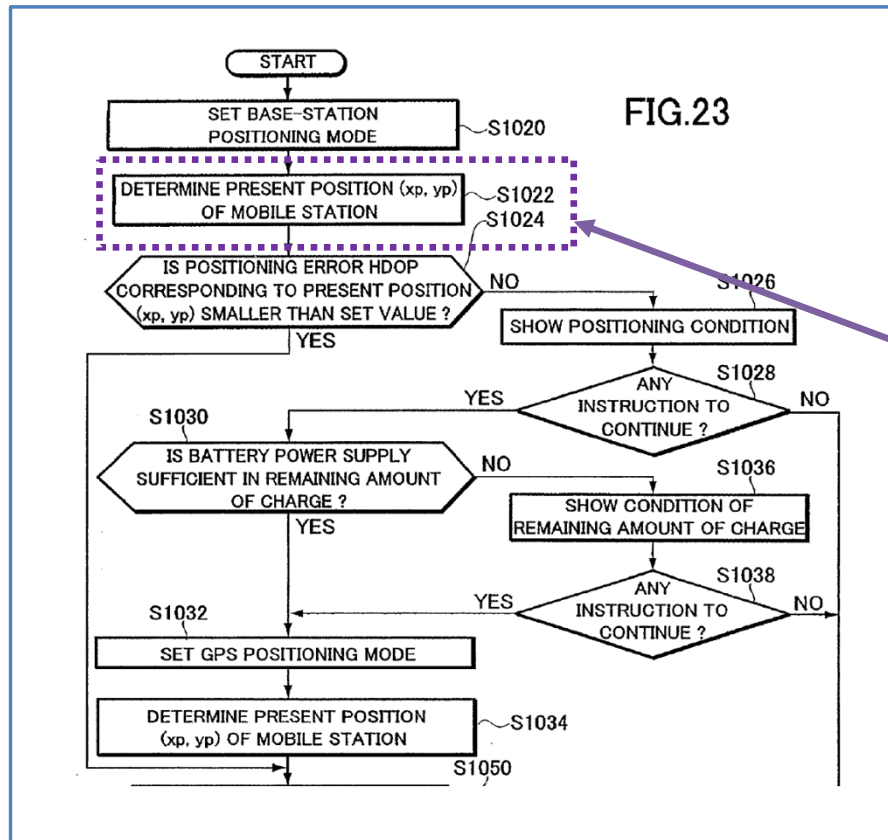
	“disjunctive”		“conjunctive”
<u>Claim Term</u>	<u>Watters</u>	<u>Nohara</u>	<u>Watters+Nohara</u>
“position” used to power on GPS	✓		✓
“position error” used to power on GPS	✓	✓	
specific “position error” calculation used to power on GPS, under PO’s proposed construction		✓	

Watters alone satisfies the claims based on its use of “accuracy” (i.e. position errors) without needing to reach any of the other arguments or grounds

Overview

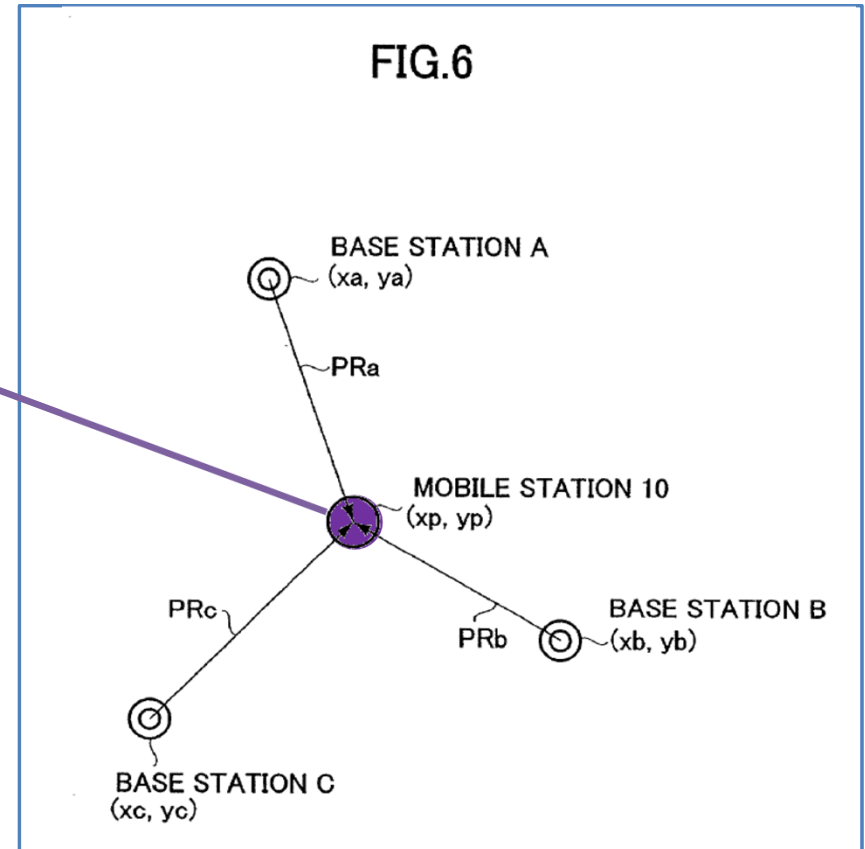
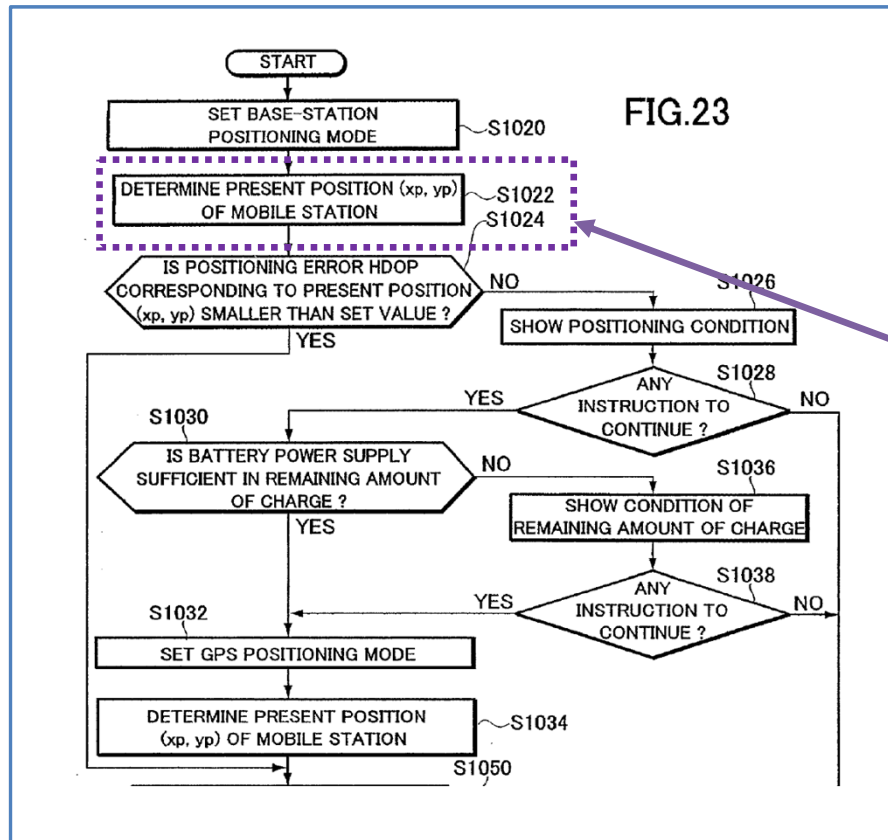
- Alleged Invention
- Overview of the Prior Art
- Claim construction issues
- Ground 1 – Obviousness over Watters
- **Ground 2 – Obviousness over Nohara**
- Ground 4 – Obviousness over Watters + Nohara
- Other issues and grounds

Nohara's use of position error to turn on GPS: Step 1 – Acquire position using cellular infrastructure



[0304] Initially, at step S1020, the control unit 18 sets a positioning mode of using incoming waves from base stations for positioning (hereinafter, referred to as “base-station positioning mode”) At step S1022, the present position (xp,yp) of the positioning apparatus 10 is determined in the base-station positioning mode.

Nohara's use of position error to turn on GPS: Step 1 – Acquire position using cellular infrastructure

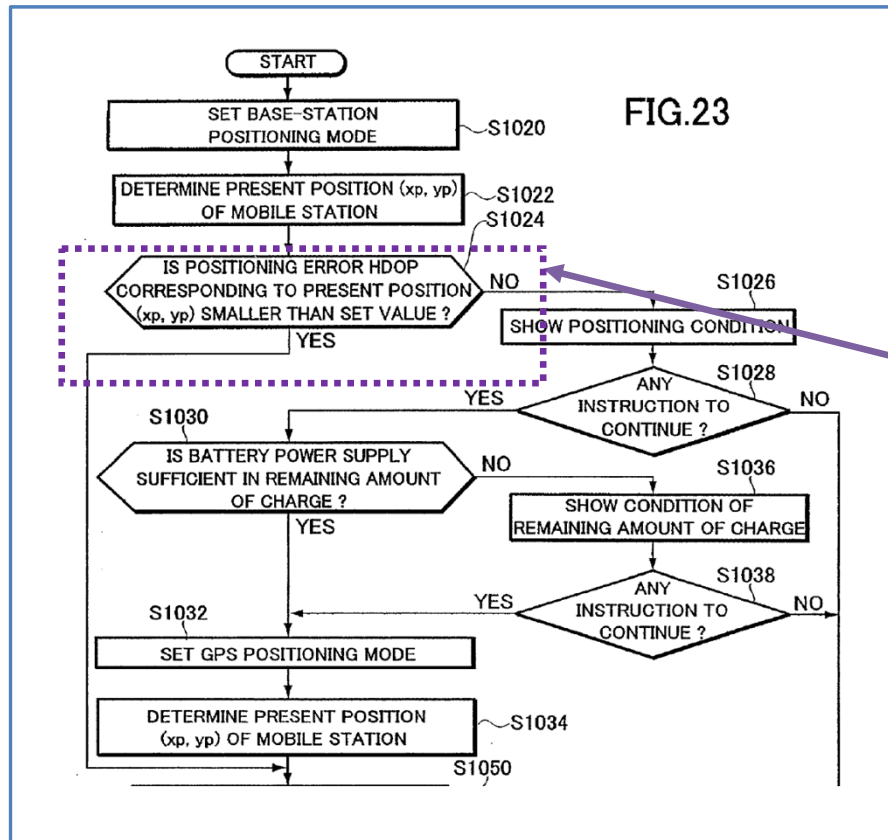


Demonstrative Exhibit Not Evidence

Ex-1006 at Fig. 23 (Partial), Fig. 6

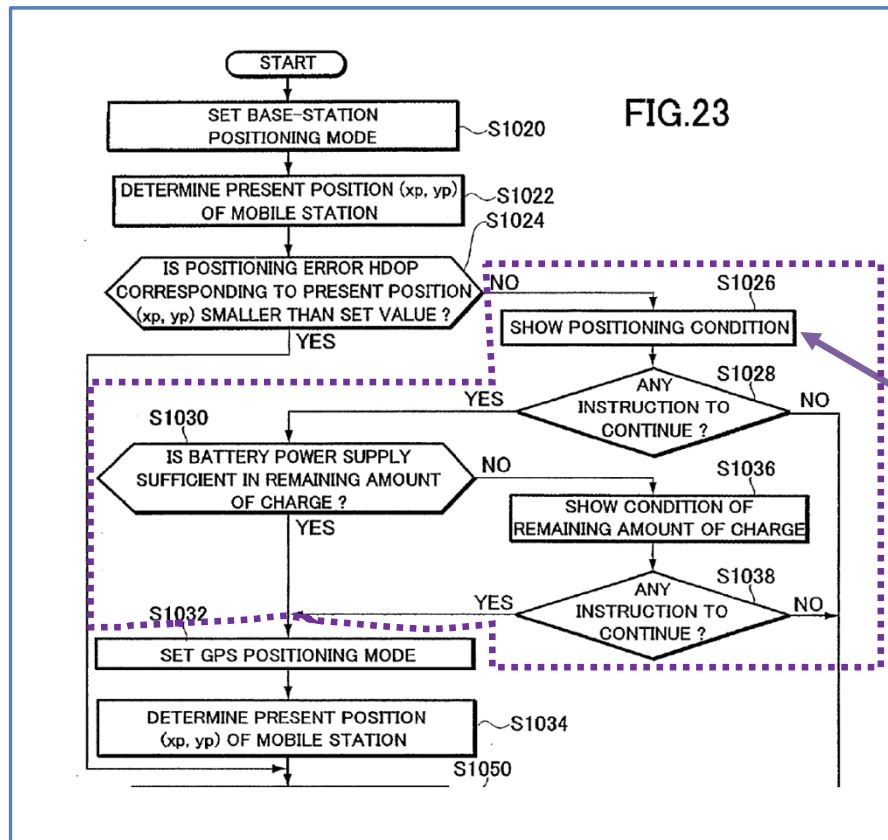
41

Nohara's use of position error to turn on GPS: Step 2 – determine if position error is greater or smaller than threshold



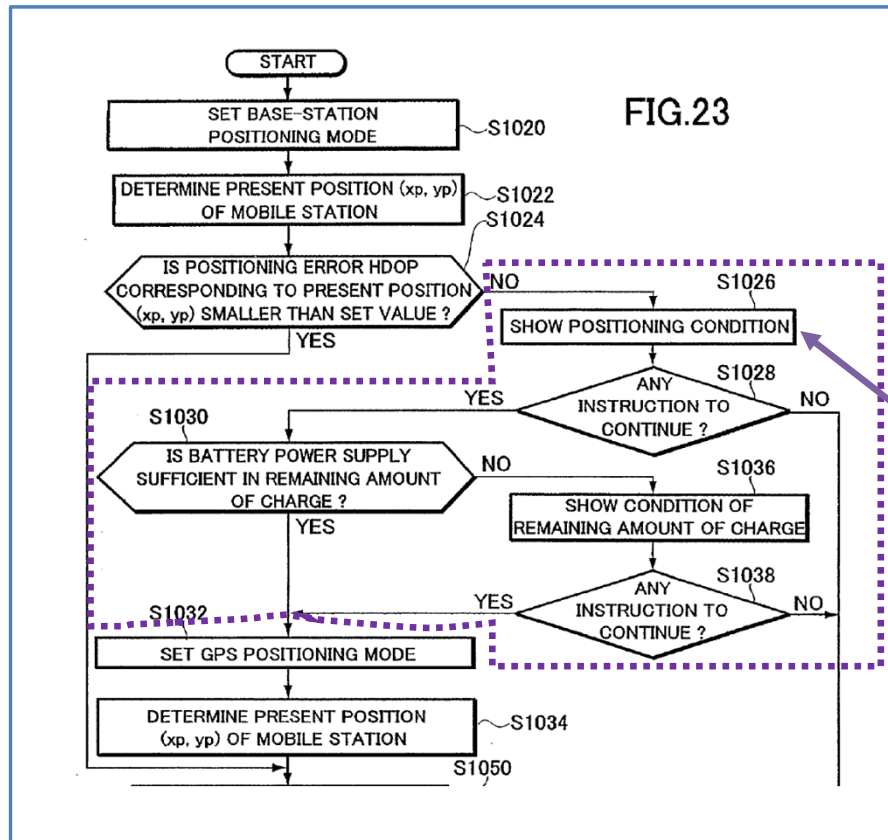
[0310] At step S1024 above, if the positioning error HDOP corresponding to the present position (xp,yp) determined in the base-station positioning mode is greater than the predetermined set value (if “NO”), go to step S1026. Here, the display unit 16 displays that favorable positioning precision has not been obtained, thereby presenting the positioning condition to the users or others.

Nohara's use of position error to turn on GPS: Step 3 – Display positioning condition and do other checks

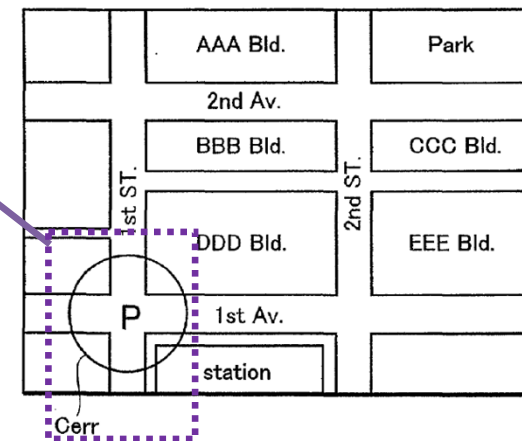


[0310] At step S1024 above, if the positioning error HDOP corresponding to the present position (xp,yp) determined in the base-station positioning mode is greater than the predetermined set value (if “NO”), go to step S1026. Here, the display unit 16 displays that favorable positioning precision has not been obtained, thereby presenting the positioning condition to the users or others.

Nohara's use of position error to turn on GPS: Step 3 – Display positioning condition and do other checks



[0215] As shown in FIG. 15(b), when the positioning error HDOP is greater than a predetermined value, the display unit 16 makes on-screen display such as the circle Cerr equivalent to the magnitude of the positioning error HDOP, along with the display “P” which indicates the present position (xp,yp). Therefore, it is possible to notify users or others of how precise the result of the positioning is or of the quality of the positioning environment and the like, achieving improved convenience and the like.



Nohara's use of position error to turn on GPS: Step 3 – Display positioning condition and do other checks

Testimony of Patent Owner's Expert, Dr. Pullen:

Q. Okay. But what's shown in Figure 15-B, Cerr, that is an error range around position P, right?

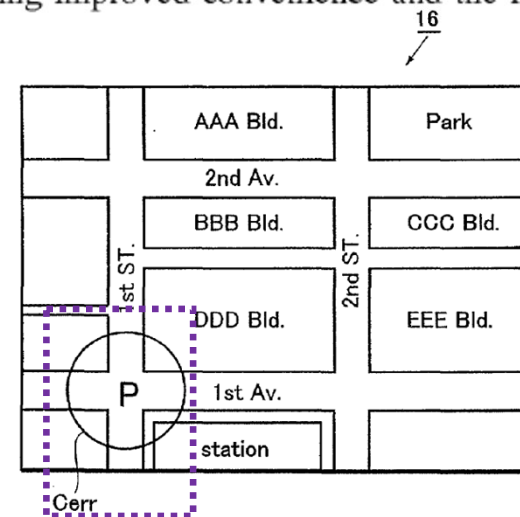
A. It's a -- it's a circle derived for the display that attempts to characterize what the error might be.

Q. That range is going to be some distance; right?

A. The radius is the distance from the center of the circle.

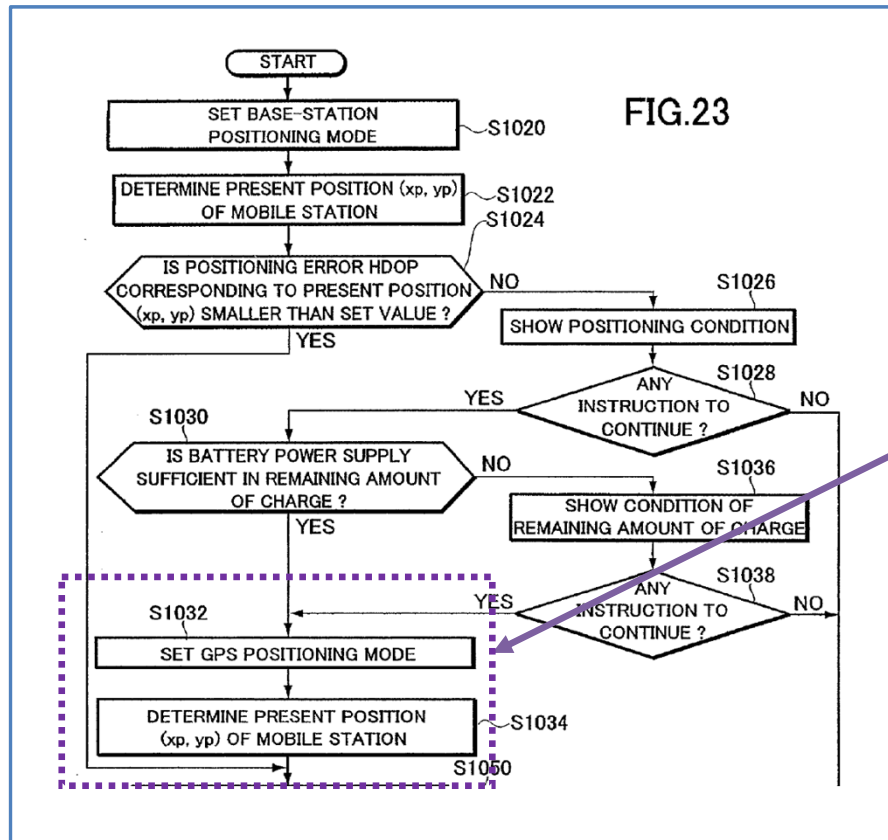
PO's expert admits that Nohara displays Cerr, an error distance range

[0215] As shown in FIG. 15(b), when the positioning error HDOP is greater than a predetermined value, the display unit 16 makes on-screen display such as the circle Cerr equivalent to the magnitude of the positioning error HDOP, along with the display "P" which indicates the present position (xp,yp). Therefore, it is possible to notify users or others of how precise the result of the positioning is or of the quality of the positioning environment and the like, achieving improved convenience and the like.



Ex-1006 at Fig. 15(a), ¶1215; Ex-1043 at 70:2-7, 70:25-71:3

Nohara's use of position error to turn on GPS: Step 4 – Turn on GPS after position error threshold exceeded



[0312] Next, at step S1030, the battery power supply 37 undergoes battery check for the remaining amount of charge, to determine if the remaining amount of charge is sufficient as compared to a predetermined set value. If the remaining amount of charge is sufficient (if “YES”), enter step S1032 to set a positioning mode of using the GPS for positioning (hereinafter, referred to as “GPS positioning mode”). At step S1034, the present position (xp,yp) of the positioning apparatus 10 is determined in the GPS positioning mode.

Patent Owner dispute regarding Nohara's position error HDOP is premised on its erroneously narrow construction

Patent Owner Surreply:

Nohara's disclosure of HDOP is not a "position error" as a POSITA would understand "position error" is used in the claims of the '206 Patent. A POSITA would understand that HDOP is fundamentally a metric related to the geometry of a system, and indicates a statistical distribution of what position errors could potentially be, when used in conjunction with additional measurement inputs, as a result of the geometry of a system. Ex. 2001 ¶¶44-46. Nohara may choose to call HDOP a "position error" for its purposes, but a POSITA would understand that the information conveyed by HDOP is not what is meant by the use of "position error" in the claims of the '206 Patent. Ex. 2001 at ¶50. Even when

Patent Owner has no response under the plain meaning of position error

Nohara alone teaches the claims with its use of position error to turn on GPS

<u>Claim Term</u>	<u>"disjunctive"</u>		<u>"conjunctive"</u>
	<u>Watters</u>	<u>Nohara</u>	<u>Watters+Nohara</u>
"position" used to power on GPS	✓		✓
"position error" used to power on GPS	✓	✓	
specific "position error" calculation used to power on GPS, under PO's proposed construction		✓	

**Nohara alone satisfies the claims based on its use of "position error HDOP"
without needing to reach any of the other arguments or grounds**

Patent Owner against Nohara's specific teaching

Patent Owner Response:

Nohara definition of HDOP appears consistent with the conventional, unitless definition of HDOP. *Id.* ¶¶47-48. However, Nohara also discloses as single equation (Ex-1006 ¶141, equation (9)) that is inconsistent with the conventional unitless definition of HDOP. *Id.* at ¶49-50. However, whether Nohara's HDOP is dimensionless or is "weighted" to be presented in unites of distance, it is fundamentally only a statistical distribution of possible position errors from which position error cannot be "determined" as required by the Claims. *Id.* ¶51

FALSE

Nohara alone teaches the claims under Patent Owner's narrow "position error" claim construction

[0142] As shown in the following equation (9), a covariance matrix $(A^T \cdot A)^{-1}$ is derived from the foregoing equation (8). The covariance matrix $(A^T \cdot A)^{-1}$ can be expressed as the following equation (10):

$$COV(\delta X) = A^{-1} \cdot COV(\delta R) \cdot (A^{-1})^T \quad (9)$$

$$\cong (A^T \cdot A)^{-1}$$

$$(A^T \cdot A)^{-1} = \begin{bmatrix} \sigma_{xx}^2 & \sigma_{xy}^2 & \sigma_{yx}^2 \\ \sigma_{yx}^2 & \sigma_{yy}^2 & \sigma_{xx}^2 \\ \sigma_{xx}^2 & \sigma_{xy}^2 & \sigma_{yx}^2 \end{bmatrix} \quad (10)$$

[0143] With the covariance matrix $(A^T \cdot A)^{-1}$ derived thus, the terms σ_{xx}^2 , σ_{xy}^2 , σ_{yx}^2 , and σ_{yy}^2 which constitute the matrix of the foregoing equation (10) show variances having the properties of weighting factors which affect the positioning precision depending on the communication environment between the base stations A, B, and C, and the positioning apparatus 10. Therefore, the smaller the terms σ_{xx}^2 , σ_{xy}^2 , σ_{yx}^2 , and σ_{yy}^2 are, the smaller positioning errors and the higher positioning precisions the approximate positions POSI determined have.

Patent Owner's Expert, Dr. Pullen:

¶50. A POSITA would understand that the covariance matrices $COV(\delta R)$ and $COV(\delta X)$ express the statistical variation of each element of the unknown vectors δR (range errors from each transmitter) and δX (position error and time axes) and have units of distance squared. Ex. 2007, pp. 207-211, equation (6.16); Ex. 2009, pp. 322-333. Although inconsistent with the conventional, dimensionless definition of HDOP, the elements of the pseudoinverse matrix $(A^T \cdot A)^{-1}$ defined in Nohara could be interpreted as weighting factors having units of distance squared. Ex. 1006, ¶142.

Nohara specifically calculates positioning errors in units of distance

Nohara alone teaches the claims under Patent Owner's narrow "position error" claim construction

Patent Owner's Expert, Dr. Pullen:

[0144] Then, as shown in the following equation (11), a root-sum-square value HDOP (Horizontal Dilution of Precision) of the terms σ_{xx}^2 and σ_{yy}^2 is determined. The value HDOP shall be regarded as the positioning error quantified on the plane in the horizon system of coordinates.

$$HDOP = \sqrt{\sigma_{xx}^2 + \sigma_{yy}^2} \quad (11)$$

¶51. Nohara refers to the elements of $(A^T A)^{-1}$ as "... variances having the properties of weighting factors which affect the positioning precision depending on the communication environment between the base stations A, B, and C, and the positioning apparatus 10." Ex. 1006, ¶143. Interpreting the covariance entries σ_{xx}^2 and σ_{yy}^2 as having units of distance squared, Nohara's equation (11) would result in a "weighted" version of HDOP in units of distance. The key distinction between the

Nohara specifically calculates positioning errors in units of distance

Nohara alone teaches the claims under Patent Owner's narrow "position error" claim construction

Petitioner's Expert, Mr. Andrews:

[0144] Then, as shown in the following equation (11), a root-sum-square value HDOP (Horizontal Dilution of Precision) of the terms σ_{xx}^2 and σ_{yy}^2 is determined. The value HDOP shall be regarded as the positioning error quantified on the plane in the horizon system of coordinates.

$$HDOP = \sqrt{\sigma_{xx}^2 + \sigma_{yy}^2} \quad (11)$$

45. PO's expert argues that Nohara's position error is dimensionless and unitless, and thus cannot meet his narrow construction. Ex-2001 ¶¶47-49, 51, 52. PO also states that "Nohara definition of HDOP appears consistent with the conventional, unitless definition of HDOP." POR, 25. But PO's expert then acknowledges *that this is not actually what Nohara discloses*. Ex-2001 ¶49. PO's expert points to no disclosure in Nohara that provides an unitless or dimensionless definition of HDOP. *Id.* Instead, PO's expert acknowledges that Nohara's equation 9 and disclosures in paragraph 141 describe position error in distance terms (e.g., Δx and Δy), which would have associated units. *Id.* ¶49. PO's expert also states

Nohara specifically calculates positioning errors in units of distance

Nohara alone teaches the claims with its use of position error to turn on GPS

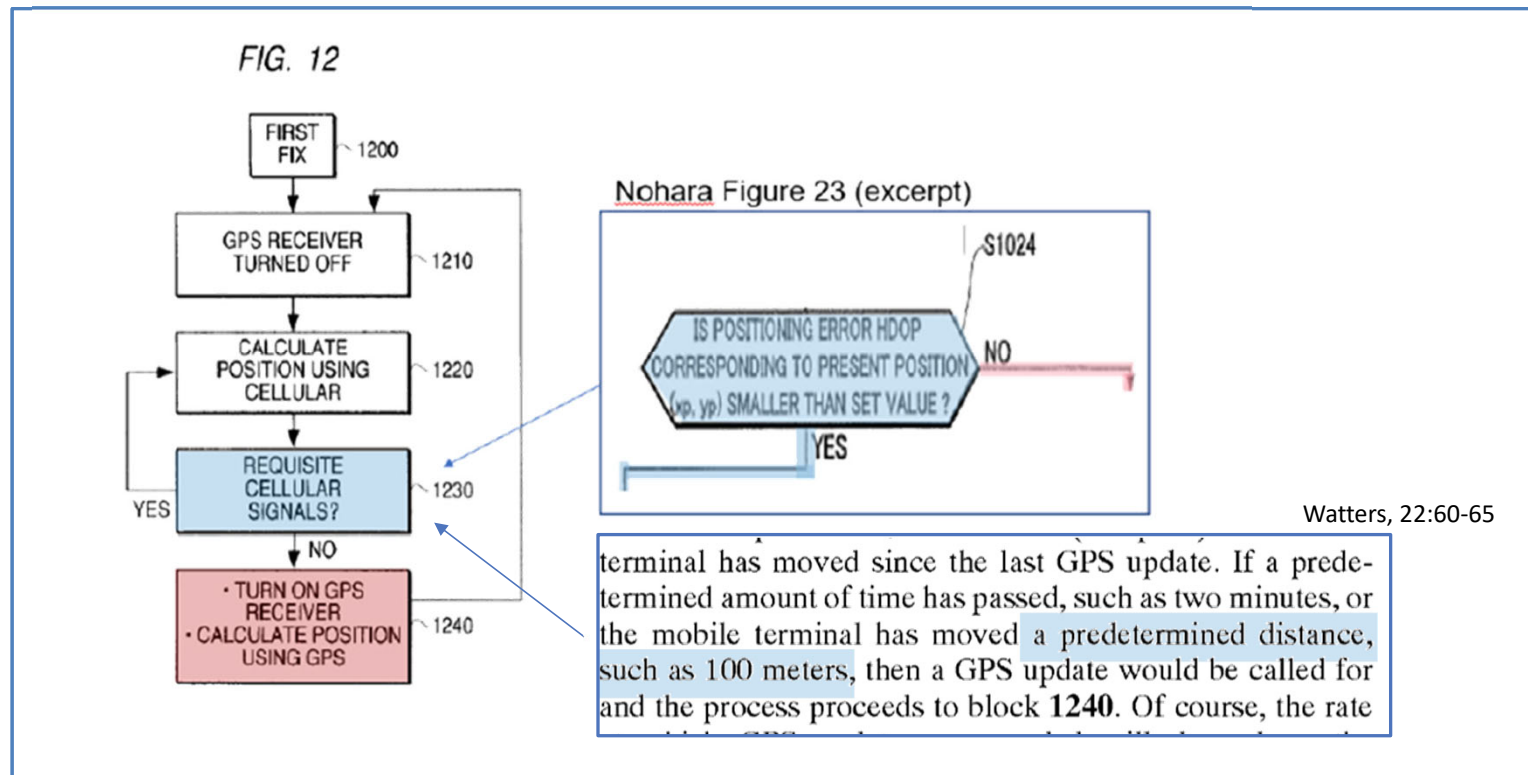
	“disjunctive”		“conjunctive”
<u>Claim Term</u>	<u>Watters</u>	<u>Nohara</u>	<u>Watters+Nohara</u>
“position” used to power on GPS	✓		✓
“position error” used to power on GPS	✓	✓	
specific “position error” calculation used to power on GPS, under PO’s proposed construction		✓	

**Nohara alone satisfies the claims under Patent Owner’s construction
that requires position errors to be calculated in units of distance**

Overview

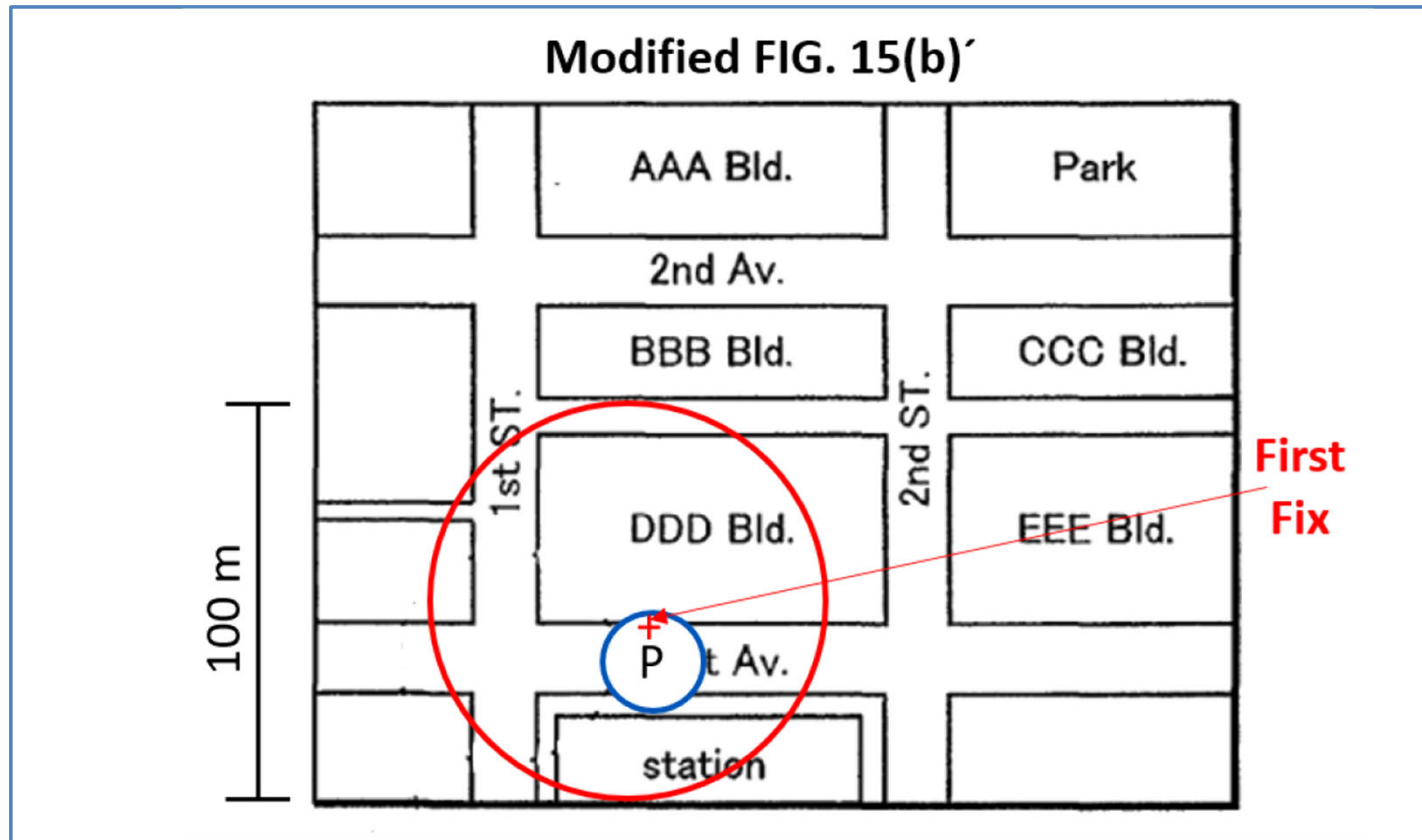
- Alleged Invention
- Overview of the Prior Art
- Claim construction issues
- Ground 1 – Obviousness over Watters
- Ground 2 – Obviousness over Nohara
- **Ground 4 – Obviousness over Watters + Nohara**
- Other issues and grounds

If the claims are interpreted to require using both position and position errors to turn on GPS, Watters+Nohara teaches it



PO does not dispute motivations to combine Watters and Nohara

If the claims are interpreted to require using both position and position errors to turn on GPS, Watters+Nohara teaches it

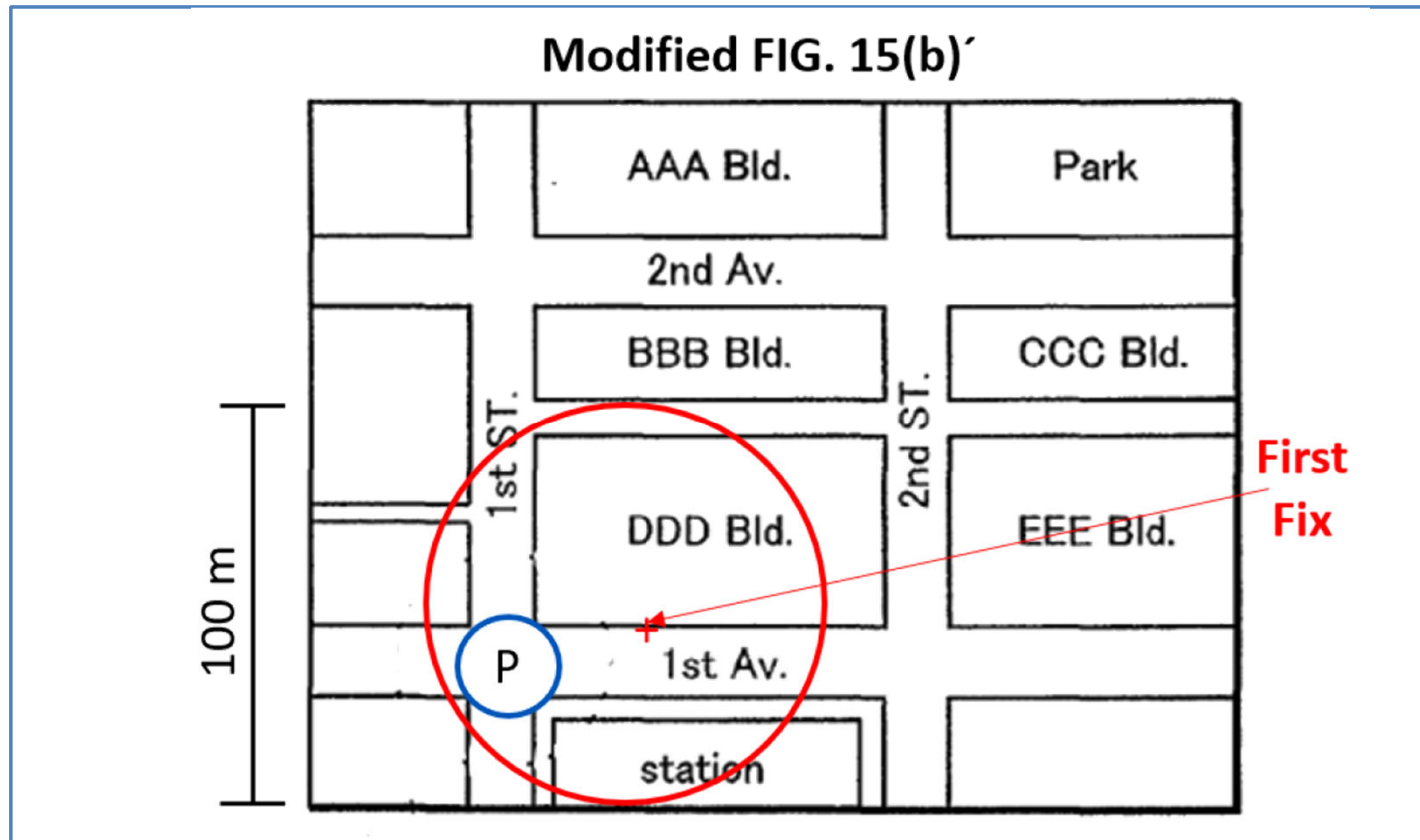


Demonstrative Exhibit Not Evidence

Ex-1006 at Fig. 15(b) (modified), discusses at Reply (Paper 14) at 25

56

If the claims are interpreted to require using both position and position errors to turn on GPS, Watters+Nohara teaches it

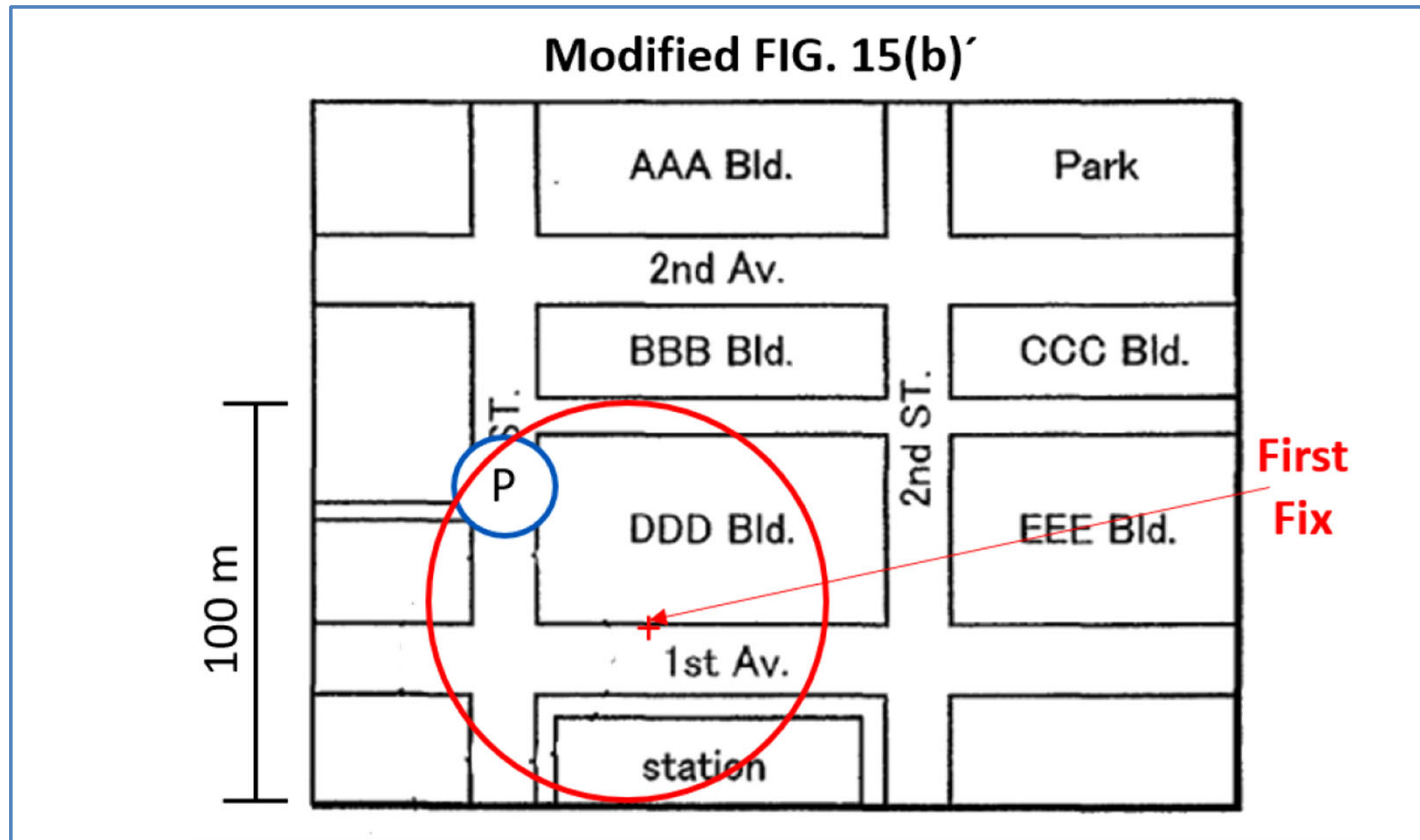


Demonstrative Exhibit Not Evidence

Ex-1006 at Fig. 15(b) (modified), discussed at Reply (Paper 14) at 26

57

If the claims are interpreted to require using both position and position errors to turn on GPS, Watters+Nohara teaches it

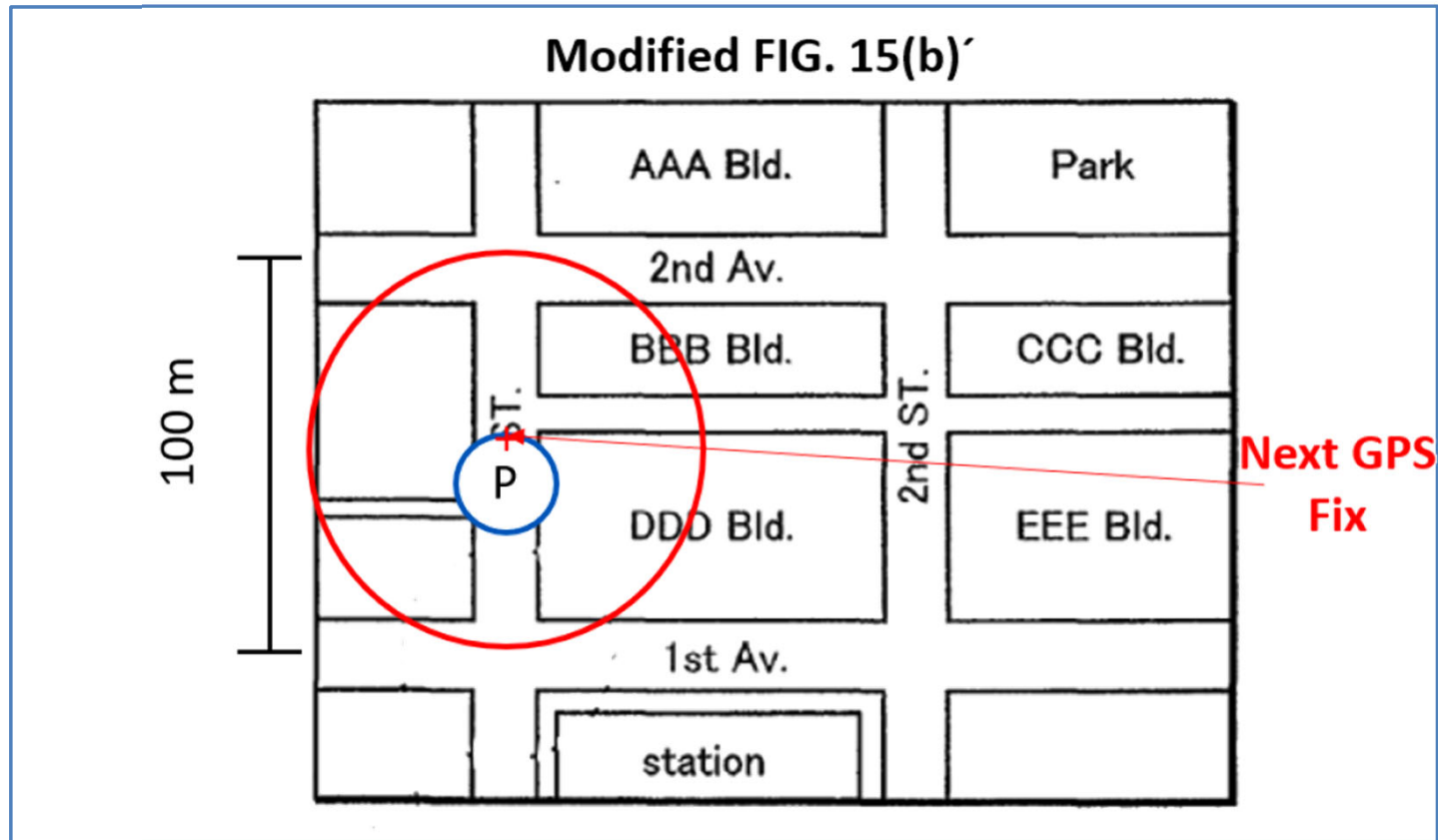


Demonstrative Exhibit Not Evidence

Ex-1006 at Fig. 15(b) (modified), discussed at Reply (Paper 14) at 27

58

If the claims are interpreted to require using both position and position errors to turn on GPS, Watters+Nohara teaches it



Demonstrative Exhibit Not Evidence

Ex-1006 at Fig. 15(b) (modified), discussed at Reply (Paper 14) at 28

59

Patent Owner's argument is contradicted by Nohara

Patent Owner Surreply:

24. As explained above, neither Cerr nor HDOP are a "position error" as would be understood from the '206 Patent. Accordingly, and as Patent Owner argued in its Response, the combination of Watters and Nohara does not render Claims 37-45 obvious under the broader "disjunctive" interpretation and therefore also cannot render the same claims obvious under the narrow "conjunctive" interpretation of the claims that Petitioners advance.

FALSE

Nohara ¶160

[0160] If the positioning error HDOP corresponding to the present position (xp,yp), obtained upon the determination of the present position (xp,yp), has a value greater than a predetermined value, the positioning error HDOP is converted into a range. Then, as illustrated in FIG. 15(b), a circle Cerr is displayed around the present position (xp,yp) with the range converted from the positioning error HDOP as the radius. This provides measures such as making the users or others check for the degree of precision the present position (xp,yp) has.

Demonstrative Exhibit Not Evidence

Ex-1001 at Cl. 37; Surreply (Paper 15) at 9; Ex-1006 ¶160

60

Patent Owner's argument is contradicted by its own expert testimony

Patent Owner Surreply:

24. As explained above, neither Cerr nor HDOP are a "position error" as would be understood from the '206 Patent. Accordingly, and as Patent Owner argued in its Response, the combination of Watters and Nohara does not render Claims 37-45 obvious under the broader "disjunctive" interpretation and therefore also cannot render the same claims obvious under the narrow "conjunctive" interpretation of the claims that Petitioners advance.

FALSE

Q. Okay. But what's shown in Figure 15-B, Cerr, that is an error range around position P, right?

A. It's a -- it's a circle derived for the display that attempts to characterize what the error might be.

Q. That range is going to be some distance; right?

A. The radius is the distance from the center of the circle.

Watters+Nohara teach the claims using both position and position errors to turn on GPS

<u>Claim Term</u>	<u>“disjunctive”</u>		<u>“conjunctive”</u>
	<u>Watters</u>	<u>Nohara</u>	<u>Watters+Nohara</u>
“position” used to power on GPS	✓		
“position error” used to power on GPS	✓	✓	
specific “position error” calculation used to power on GPS, under PO’s proposed construction		✓	

**Watters+Nohara teach the claims under the narrower “conjunctive” view
using both position and position errors to turn on GPS**

Overview

- Alleged Invention
- Overview of the Prior Art
- Claim construction issues
- Ground 1 – Obviousness over Watters
- Ground 2 – Obviousness over Nohara
- Ground 4 – Obviousness over Watters + Nohara
- Other issues and grounds

Ground 1: Claims 39/42/45 in view of Watters: 100-meters traveled since last GPS position

39. The method according to claim 37, wherein said determining when said embedded GPS module should be powered on is also dependent on at least one of; a last satellite position; a last position determined by the GPS; and a last time determined by the GPS.

starting at block 1210. Alternative inquiries at block 1230 include determining how long (in time) it has been since the last GPS update and/or how far (in space) the mobile terminal has moved since the last GPS update. If a prede-

**PO argues against “a last satellite position”,
but “a last position determined by GPS” is all that is required**

Grounds 3 and 5: adding Lau's low power mode to Watters and Nohara

38. The method according to claim 37, wherein said powered on comprises said module powering up from a low-power mode such as a TricklePower power-down mode.

powered-up **308**. A current location for the mobile device is then determined **310** using the GPS receiver. Typically, the GPS receiver will obtain GPS information and a controller (or processor) will process the GPS information to produce a current location (or position). After the current location has been determined **310**, the GPS receiver can be powered-down **312**. Here, the GPS receiver is returned to a low-power state so as to conserve power. As an example, the low-power state (or powered-down state) can be a sleep mode or it can be a disabled mode. The current location is then saved **314**.

PO has no independent argument against Lau in Grounds 3 and 5

**Google LLC, Samsung Electronics Co., and Samsung
Electronics America**

v.

Nariste Networks Pty, Ltd.

Petitioner's Presentation For IPR2023-01374

U.S. Patent No. RE48,206

January 14, 2025