

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC.; SAMSUNG ELECTRONICS CO., LTD.; AND
SAMSUNG ELECTRONICS AMERICA, INC.,
Petitioner

v.

NARISTE NETWORKS PTY. LTD.
Patent Owner.

Case No. IPR2023-01374
U.S. Patent No. RE48,206

**DECLARATION OF SCOTT ANDREWS IN SUPPORT
OF PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE**

TABLE OF CONTENTS

	Page
I. INTRODUCTION	1
II. BACKGROUND AND QUALIFICATIONS	1
III. INFORMATION CONSIDERED	1
IV. RELEVANT LEGAL STANDARDS	2
V. SUMMARY OF OPINIONS	2
VI. THE PROPOSED CLAIM CONSTRUCTIONS ARE INCORRECT	3
A. Claims 37, 40, and 43: “at least one of a current radio position and a position error of said mobile device”	3
B. Claims 37, 40, and 43: “a position error of said mobile device determined from the wireless communications network”	3
C. Means term of Claim 40	6
VII. THE ARGUMENTS AGAINST GROUND 1 FAIL	6
A. Claims 37, 40, and 43 Are Obvious Over Watters	6
1. Watters teaches determining when to power on the GPS module dependent on a current radio position of the mobile device	7
2. Watters teaches determining when to power on the GPS module dependent on a position error of the mobile device	11
B. Claims 39, 42, and 45 Are Obvious Over Watters	16
1. Watters teaches “determining when said embedded GPS module should be powered” is 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”	16
VIII. THE ARGUMENTS AGAINST GROUND 2 FAILS	18
A. Claims 37, 40, and 43 Are Obvious Over Nohara	18
IX. THE ARGUMENTS AGAINST GROUND 4 FAILS	24
A. Claims 37-45 Are Obvious Over Watters in View of Nohara	24
X. THE ARGUMENTS AGAINST GROUNDS 3 AND 5 FAIL	29

TABLE OF CONTENTS
(continued)

	Page
A. Claims 38, 41, and 44 Are Obvious Over Watters in View of Lau	29
B. Claims 38, 41, and 44 Are Obvious Over Watters and Nohara in Further View of Lau	29
XI. CONCLUSION.....	30

LIST OF EXHIBITS¹

Ex-1001	U.S. Patent No. RE48,206
Ex-1002	Declaration of Dr. Scott Andrews
Ex-1003	Curriculum Vitae of Dr. Scott Andrews
Ex-1004	Prosecution History of U.S. Patent No. RE48,206
Ex-1005	U.S. Patent No. 5,982,324 to Watters (“Watters”)
Ex-1006	U.S. Patent Publication No. 20020151314 to Nohara (“Nohara”)
Ex-1007	U.S. Patent No. 6,975,941 to Lau (“Lau”)
Ex-1008	INTENTIONALLY LEFT BLANK
Ex-1009	INTENTIONALLY LEFT BLANK
Ex-1010	INTENTIONALLY LEFT BLANK
Ex-1011	INTENTIONALLY LEFT BLANK
Ex-1012	INTENTIONALLY LEFT BLANK
Ex-1013	INTENTIONALLY LEFT BLANK
Ex-1014	INTENTIONALLY LEFT BLANK
Ex-1015	INTENTIONALLY LEFT BLANK
Ex-1016	INTENTIONALLY LEFT BLANK
Ex-1017	INTENTIONALLY LEFT BLANK
Ex-1018	INTENTIONALLY LEFT BLANK
Ex-1019	INTENTIONALLY LEFT BLANK
Ex-1020	Claim Mapping Table
Ex-1021	Nariste Networks Pty. Ltd.’s Sur-Reply in Opposition to Defendants’ Rule 12(b)(6) Motion to Dismiss Under 35 U.S.C. § 251 and the Rule Against Recapture
Ex-1022	Yilin Zhao, Vehicle Location and Navigation Systems 43–81 (Illustrated ed. 1997)
Ex-1023	U.S. Patent No. 5,592,173 to Lau et al (“Lau”)
Ex-1024	U.S. Patent No. 6,748,224 to Chen et al (“Chen”)
Ex-1025	U.S. Patent No. 6,889,053 to Chang et al (“Chang”)
Ex-1026	U.S. Patent No. 5,663,734 to Krasner et al (“Krasner”)
Ex-1027	U.S. Patent No. 5,594,453 to Rodal et al (“Rodal”)
Ex-1028	U.S. Patent No. 7,409,188 to Syrjarinne et al (“Syrjarinne”)
Ex-1029	U.S. Patent Publication No. 20050083230 to Harvey et al (“Harvey”)

¹ Four-digit pin citations that begin with 0 are to the page stamps added by Google and Samsung in the bottom right corner of the exhibits. All other pin citations are to original page, column, paragraph, and/or line numbers.

Ex-1030	Xinrong Li, Kaveh Pahlavan, and Jacques Beneat, Performance of TOA estimation Techniques in Indoor Multipath Channels 911–915 (2002).
Ex-1031	Flowchart, https://en.wikipedia.org/w/index.php?title=Flowchart&oldid=1169392868 (last visited Aug. 30, 2023).
Ex-1032	Central processing unit, https://en.wikipedia.org/w/index.php?title=Central_processing_unit&oldid=1172444772 (last visited Aug. 30, 2023).
Ex-1033	Samir S. Soliman and Charles E. Wheatley, Geolocation technologies and applications for third generation wireless 229–251 (2002).
Ex-1034	Samir Soliman, Parag Agashe, Ivan Fernandez, Alkinoos Vayanos, Peter Gaal, and Milan Oljaca, gpsOne™: A hybrid position location system 330–335 (2000).
Ex-1035	A. M. Turing, On Computable Numbers, With an Application to the Entscheidungsproblem 230–265 (1936).
Ex-1036	Defendants’ Motion to Transfer Venue to the Northern District of California Under 28 U.S.C. § 1404(a)
Ex-1037	Defendants’ Rule 12(b)(6) Motion to Dismiss Under 35 U.S.C. § 251 and the Rule Against Recapture
Ex-1038	Nariste Networks Pty. Ltd.’s Response in Opposition to Defendants’ Rule 12(b)(6) Motion to Dismiss Under 35 U.S.C. § 251 and the Rule Against Recapture
Ex-1039	Defendants’ Reply in Support of Rule 12(b)(6) Motion to Dismiss Under 35 U.S.C. § 251 and the Rule Against Recapture (Dkt. 23)
Ex-1040	Plaintiff’s Disclosure of Asserted Claims and Infringement Contentions and Identification of Document Production Accompanying Disclosure
Ex-1041	Order Granting Motion to Stay Pending IPR
Ex-1042	Reply Declaration of Scott Andrews
Ex-1043	Dr. Samuel Pullen Deposition Transcript (Sept. 27, 2024)

1. I, Scott Andrews, declare as follows:

I. INTRODUCTION

2. I have prepared a previous declaration in connection with Google LLC; Samsung Electronics Co., Ltd., and Samsung Electronics America, Inc. (collectively, “Petitioner”) Petition for Inter Partes Review of U.S. Patent No. RE48,206 (“the ’206 Patent”) (Ex-1001), which I understand was filed concurrently therewith. I expressly affirm the entirety of my initial declaration.

3. I have prepared this declaration in connection with Petitioner’s Reply in support of its Inter Partes Review of the ’206 Patent, which I understand is to be filed concurrently with this declaration.

4. I have been asked by Counsel to consider whether certain references teach or suggest the features recited in Claims 37-45 of the ’206 Patent. My opinions and the bases for my opinions are set forth below.

II. BACKGROUND AND QUALIFICATIONS

5. My qualifications are set forth in my initial declaration, provided on October 3, 2023, which I incorporate herein by reference.

III. INFORMATION CONSIDERED

6. In preparation for this declaration, I have considered the materials discussed in this declaration, including, for example, the ’206 Patent, the references cited by the ’206 Patent, the prosecution history of the ’206 Patent and

applications from which it derives (including the references cited therein), various background articles and materials referenced in this declaration, and the prior art references identified in this declaration. I have also reviewed the expert declaration of Dr. Samuel Pullen and all of the cited exhibits contained therein, submitted on behalf of the Patent Owner. I have also reviewed the transcript of the deposition of Dr. Pullen, and all of the exhibits used therein. I have also considered the Board's decision instituting this proceeding. In addition, my opinions are further based on my education, training, experience, and knowledge in the relevant field.

7. I reserve the right to supplement or amend this declaration if additional facts and information that affect my opinions become available.

IV. RELEVANT LEGAL STANDARDS

8. I am not an attorney and offer no legal opinions. For the purposes of this declaration, I have been informed about certain aspects of the law that are relevant to my analysis. My understanding of the law is summarized in my initial declaration.

V. SUMMARY OF OPINIONS

9. For the reasons set forth here and in my initial declaration, it is my opinion that under any interpretation of the claims, Claims 37-45 of the '206 Patent are obvious under the grounds set forth in my initial declaration. Ex-1002, Section XIII.

VI. THE PROPOSED CLAIM CONSTRUCTIONS ARE INCORRECT

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

10. Patent Owner states that the “disjunctive” view of these terms should apply. Additionally, PO’s expert provided no opinion regarding the “disjunctive” or “conjunctive” constructions and testified that he does not “have an opinion as to which is correct, or which is more appropriate.” Ex-1043, 92:9-22. Regardless, Patent Owner’s expert applies the broader “disjunctive” view of these terms. Under this view, the prior art need teach only one of using a “current radio position” or a “position error” to meet the claims. POR, 15; Ex-1043, 91:13-92:8. Watters discloses using “a current radio position” and Nohara discloses using a “position error” as explained in further detail in my prior declaration and in this reply declaration. Both Watters and Nohara teach using one of these two approaches, and thus each individually satisfy the “disjunctive” view of the claims.

B. Claims 37, 40, and 43: “a position error of said mobile device determined from the wireless communications network”

11. PO’s expert Dr. Pullen alleges that the conventional definition of “position error” is “having units of distance.” Ex-2001 ¶23. I disagree.

12. In Dr. Pullen’s declaration, he argues that the ’206 Patent describes “position error” as “the difference between a predicted position and the actual position...” Ex-2001 ¶21. I generally agree 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.” But Dr. Pullen’s actual proposed construction is much narrower, reading in specific requirements for “distance” and “units.” There is no basis for doing so.

13. PO’s expert tries to rewrite the term “position error” to include “units of distance.” Yet the phrase “units of distance” appears nowhere in the intrinsic record. Indeed, the word “distance” is not found in the specification at all, and the word “unit” is used only to describe hardware, such as a “processing unit” or a “storage unit.”

14. Nevertheless, the claims in the ’206 Patent make clear that the term “position error” is broader than specifically requiring “distance” and specific measurement “units.” For example, the language of Claim 36 states “the position error is the Cramer-Rao Bound on the radio position of the mobile device.” Ex-1001, 16:1-3. A POSITA would have understood that the “Cramer-Rao Bound” is an abstract mathematical parameter that represents the lower bound for the variance unbiased estimator, not a measurement or estimate of actual error distances. Ex-1043 18:6-23 (“it doesn’t give you an estimate of the actual error. It just says -- it just gives information on the random -- the variation of the error, given that you know the sample mean.”). So it would be incorrect to limit the term “position error” to “units of distance” as PO’s expert suggests, because it would

contradict other claims in the patent.

15. The '206 Patent states “[t]he 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 [Global Positioning System].” Ex-1001, 6:34-37. For example, “[t]he difference between [the] predicted position and the actual position measured at time t can be used to formulate the position error.” *Id.*, 6:43-46. Furthermore, the '206 Patent explains that when “the predicted position of the GPS-enabled mobile device is compared with the actual position of the mobile device, [] the position error e_p is determined.” *Id.*, 7:8-11. The '206 Patent does not discuss any units associated with position error. The term “position error” would thus have been understood by a POSITA as broad enough to cover all of these examples.

16. Dr. Pullen’s position is drawn almost entirely from extrinsic evidence and his alleged general understandings of the term position error. Dr. Pullen’s example from the intrinsic record only further proves the point. It is true that a position error *could be*, e.g., “100 meters.” But there is no support in the file history or the inventor’s arguments that state that a position error *must always be* a distance like “100 meters.”

17. Further, PO’s expert testified that he is actually applying an even narrower understanding of the term “position error” that is even further afield from

the intrinsic record. Specifically, Dr. Pullen testified that the term “position error” requires an “estimate” calculated using units of distance, Ex-1043, 94:9-16, 95:14-96:2, 106:5-20, and specifically “goes beyond” what he calls a “characterization” of position error. *Id.*, 99:1-5 (“is it your opinion that Claim 37 of the ’206 patent requires an estimate of position error? A. In short, yes. An estimate that goes beyond the characterizations we’ve been discussing.”). When asked, Dr. Pullen could not point to any support in the claims or the specification for this construction that requires an “estimate of” and excludes a “characterization of” position error to satisfy the claims. *Id.*, 100:8-20. Instead of basing his construction on the claims or intrinsic record, he relied on his own unsupported accord of what a POSITA would allegedly understand. *Id.*

18. Accordingly, Dr. Pullen’s interpretation of “position error” is unsupported and inconsistent with the record. Even so, both Watters and Nohara teach this limitation even under this narrow construction.

C. Means term of Claim 40

19. PO’s expert does not present any dispute regarding the construction of the means term, or its application to the prior art. Ex-2001 ¶¶19-25.

VII. THE ARGUMENTS AGAINST GROUND 1 FAIL

A. Claims 37, 40, and 43 Are Obvious Over Watters

20. As previously discussed in my initial declaration, Watters teaches

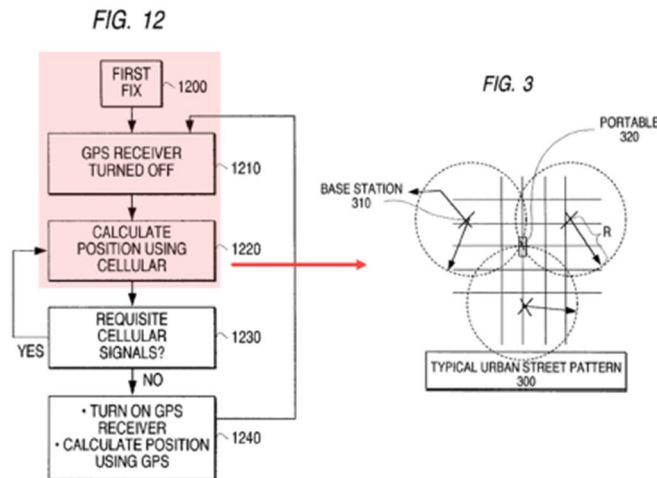
using a “current radio position” and/or a “position error” to determine when to switch from cellular based positioning and power on GPS based positioning. Ex-1002 ¶¶75-78, 103-114. Under PO’s “disjunctive” view of the claims, either Watters’s use of “position” alone, or “position error” alone, is sufficient to teach the claims.

1. Watters teaches determining when to power on the GPS module dependent on a current radio position of the mobile device

21. Dr. Pullen’s argument against the term “current radio position” ignores my prior declaration and misstates Watters’s teachings. For example, the declaration explained how Watters teaches to: 1) measure a “first fix” position with GPS; next, 2) turn off GPS; next, 3) *measure a current “position using cellular” infrastructure*; and last, 4) turn on GPS if the difference between the first fix position and current position are greater than a “predetermined distance, such as 100 meters.” Ex-1002 ¶¶105-108. PO’s expert does not provide a credible argument that these teachings do not teach a “current radio position.” Thus, Dr. Pullen’s arguments are disconnected from both my initial declaration and from Watters itself.

22. PO’s expert argues that “the determination of when to power on Watters’ GPS receiver is not dependent on the position at all, but instead whether there are not enough signals to calculate a position.” Ex-2001 ¶31. I disagree. My

prior declaration explained how Watters depends on a “current radio position ... determined from the wireless communications network” to enable its GPS. For example, as shown in Figure 12, Watters teaches obtaining a “first fix” from GPS, then its “GPS receiver [is] turned off.” Watters teaches next for step 1220 “calculat[ing] position using cellular.” Ex-1005, 22:47-50; Fig. 12 (below, red). PO’s expert does not dispute any of this. Ex-1043, 46:6-14. Watters explains that algorithms based on “time of arrival” or “TOA” of cellular base station signals (shown in Figure 3, below right) can be used to obtain an “accurate location fix.” *Id.*, 5:14-25; *see also id.*, 5:26-34 (explaining the time difference of arrival (TDOA) method).



23. While not shown in Figure 12, the specification teaches to determine whether the device has traveled a “predetermined distance” and use that information to decide whether GPS should be turned back on. Specifically, Watters

teaches determining “how far (in space) the mobile terminal has moved since the last GPS update.” Ex-1005, 22:59-60. Watters explains that GPS is used if “the mobile terminal has moved a predetermined distance, such as 100 meters.” *Id.*, 22:61-63. A POSITA would have understood that an obvious way to determine this distance in space would have been to use the starting position determined by the GPS “first fix” (step 1200), and the difference from the current position determined by the cellular network at step 1220.

24. Indeed, PO’s expert admitted, as he must, that a POSITA could calculate the distance between two positions using a position calculated at step 1220 using cellular and a first fix calculated at step 1200 using GPS. Ex-1043, 55:14-18 (“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 thus teaches to compare the current radio position determined from cellular sources using TOA or other radio-based (non-GPS) technique to the previous GPS fix and, if that distance exceeds a threshold (e.g., 100 meters), the GPS is turned back on to obtain a new fix. Ex-1005, 22:63-64 (referring to Figure 12 (1240)). Accordingly, a POSITA would have determined “how far” the device has traveled based, at least in part, on the current radio position of the device determined by the cellular network.

25. In response, PO's expert focuses his argument on setting out *other* ways that distance can be determined, rather than addressing what Watters actually teaches. For example, PO's expert argues that "determination of how far something has traveled *can be* calculated simply by multiplying a mobile device's velocity by the amount of time it has been traveling at that velocity." Ex-2001 ¶33. Dr. Pullen also argues that the "Doppler shift of a radio signal" was a well-known method for determining velocity. *Id.* ¶35. Furthermore, PO's expert argues that "data from accelerometers present in a mobile device could be integrated (via calculus) over a selected time interval to determine how far the mobile device has moved." *Id.* ¶36. None of these arguments are connected to Watters's actual teachings. Watters does not teach anything about using "velocity" or "speed" of an object to calculate a distance traveled. Watters only mentions velocity and speed to explain that radio signals have a certain "speed" (e.g., the speed of light) when propagating through the air (Ex-1005, 5:19-22, 5:42-44, 20:19-23, 24:50-53) and that GPS systems are capable of reporting "velocity" (Ex-1005, 1:19-22). And Watters does not mention "accelerometers" or "doppler shifts" at all. Dr. Pullen's attempt to point to things other than what the prior art actually teaches misses the mark.

26. PO's expert centers his arguments on his view of what "Watters *likely* suggests," rather than what my initial declaration identified as its actual teachings. As previously explained, Watters uses a difference in "position" between the last

GPS position and the position determined by the cellular network (at step 1220) to turn on the GPS to obtain a new GPS position. PO's expert cannot avoid Watters's teachings on this point, so he attempts a disconnected misdirection to something else that is not even mentioned in Watters. Nevertheless, Watters teaches this limitation.

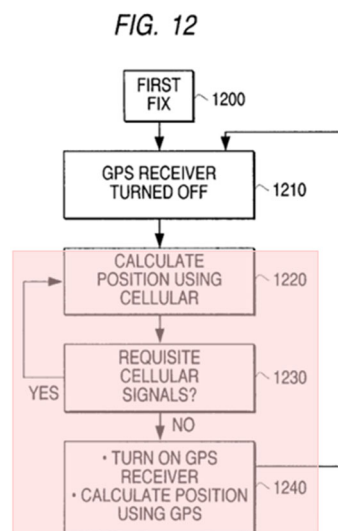
2. Watters teaches determining when to power on the GPS module dependent on a position error of the mobile device

27. Regarding Watters's teaching of "position error," PO's argument rests entirely on its narrow proposed construction as discussed above in Section VI.B. PO's expert offers no opinion, but PO alleges that powering on Watters's GPS module when requisite cellular signals are not available is "not [a] determination of a position error at least because position error is measured in unites [sic] of distance." POR, 18 (citing Ex-2001 ¶25). I disagree. PO does not, and cannot, distinguish Watters under the correct meaning of this term. Regardless, even under PO's narrow construction, Watters teaches powering on a GPS module dependent on a position error of the mobile device.

28. *First*, as explained in my prior declaration, Watters teaches powering on GPS based on "position error" under the meaning of this term when properly understood as being broad enough to include, e.g., "the error between the predicted position of the mobile device and that of the actual position." For example, my prior declaration explained that there are errors inherent in cellular based

approaches, such as TOA (time of arrival) and TDOA (time difference of arrival).

Ex-1002 ¶110 (citing Ex-1005, 5:54-6:12, 23:41-44.). These errors affect the accuracy of cellular based positioning approaches, and they can be characterized, or estimated, by the receiver. Because of this potential imprecision, the “rate at which GPS updates are needed [in block 1240] will depend on the conditions under which the mobile is operating.” Ex-1005, 22:64-66. After determining cellular position at step 1220, step 1230 determines whether to continue using cellular-based positioning. Ex-1002 ¶107.



29. As shown in Figure 12, the GPS module is powered on (step 1240) when the cellular network infrastructure does not provide the “requisite” signals to determine position (step 1230). Ex-1005, 22:50-54, Fig. 12. Watters teaches “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 ... cellular network

infrastructure signals are known to be of good accuracy.” *Id.*, 22:66-23:2. By contrast, more frequent updates would be needed if the signal accuracy is low, such as when multi-path propagation is present. *Id.*, 23:41-44 (GPS updates reduce errors from multi-path problems). A POSITA would have understood that a signal with “good accuracy” leads to low positioning errors, while a signal of “poor accuracy” leads to relatively larger positioning errors. Ex-1043, 61:20-22 (“Everything else being equal, if you knew the multipath errors were higher, then, yes, the position errors would be higher”); Ex-1002 ¶111 (citing Ex-1030 and explaining that a weak signal may indicate a multipath propagation, which would result in higher positioning errors in a TOA calculation).

30. Additionally, Watters teaches that multipath propagation errors may cause an “error between the predicted position of the mobile device and that of the actual position.” For example, Watters explains:

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.

Ex-1005, 6:1-12. The multipath positioning error will thus cause the system to predict a position (e.g., resulting from a user moving in a straight line) that is

different than actual position (e.g., resulting from a user having turned a corner around a building). Thus, Watters's teaches to account for multipath position errors by requiring more or less frequent updates depending on whether the signals have "good accuracy."

31. *Second*, PO's expert argues that "the inventor characterized position error as follows '[i]magine the mobile application requires only a 100-meter location accuracy . . . If the reported error was less than 100 meters, the GPS power would not be turned on.'" Ex-2001 ¶22 (citing Ex-2002, 303-04). Dr. Pullen explains that this "real-world example" characterizes position error as having units of distance. Ex-2001 ¶¶22-23. As explained above, even if Dr. Pullen's description of these inventor statements were accurate, the "example" does not narrow the meaning of the term "position error." Regardless, Watters teaches even this narrow view of "position error."

32. For example, Watters specifically teaches positioning errors, caused by, e.g., multipath propagation, being measured in specific units of distance such as meters. Watters explains "***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***. To compensate for this error, GPS can be used." Ex-1005, 25:3-8.

33. Accordingly, even if Dr. Pullen's and PO's narrow interpretation of the term "position error" were accepted, Watters expressly teaches it.

34. PO's expert also argues that my discussion of GPS and Cellular Positioning Errors in my prior declaration is incorrect and that errors are not deterministic but instead "known." Ex-2001 ¶29. I disagree with this argument. As discussed in my prior declaration, some errors are deterministic and because "the actual position is estimated from a set of possible positions identified by these intersections." Ex-1002 ¶63. For example, if there is a situation where none of the possible positions can be accurate (i.e., all of the lines do not cross at a single point), then I can estimate the error based on how far apart the apparent solutions are. There are various way to do this mathematically. For example using three lines of triangulation where the lines cross one another in slightly different places, then there would be three possible candidate positions. A POSITA would be able to determine how far apart these intersection points are, and from this determine what the overall error in the position is. As I previously discussed in my initial declaration, "[t]he error between these intersection points and the estimated position can then be used to estimate the error in the position estimate." *Id.*

B. Claims 39, 42, and 45 Are Obvious Over Watters

- 1. Watters teaches “determining when said embedded GPS module should be powered” is 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”**

35. PO’s and Dr. Pullen’s arguments against these dependent claims again ignores Watters’s teachings and are wrong.

36. First, PO argues that “distance moved is ‘relative’ and *can be* determined without using any position measurements at all, either from the GPS or from the non-GPS” means. POR, 22. PO’s expert does not offer an opinion but as noted above, even if this were true, it makes no difference because Watters specifically teaches to use a “first fix” position from GPS, then use a “current radio position” from cellular to turn on GPS, as discussed above. This positioning approach is thus dependent on (among other things) at least “a last position determined by the GPS.”

37. Second, PO’s expert again offers no opinion, but PO argues that “Watters’ provides no teaching or motivation to use the alternative inquiries for step 1230 in addition to the primary inquiry illustrated in Fig. 12 of Watters.” POR, 23. I disagree. PO’s position seems to be that some of Watters’s approaches are mutually exclusive. But there is no such teaching in Watters. Watters teaches that “it can be preferable to make use of the GPS for determining position, and *to make use of a combination of the GPS and the cellular infrastructure* when the GPS is

unavailable, or partly unavailable.” Ex-1005, 22:28-32. Moreover, Watters specifically notes, e.g., in Column 26:5-52, that all aspects of its teachings can be combined together. *See, e.g.*, Ex-1005, 26:34-39 (“Finally, all four aspects may be combined into a single position system as well. Therefore, the present invention is not limited to using only one aspect of the invention in a single position location system. Rather, two or more aspects of the invention can be used in the same position location system.”) A POSITA implementing Watters would apply all of its teachings together because it is “preferable to make use of as many signals from both systems as are available to develop a more accurate result than could be obtained by working with either system exclusively.” *Id.*, 22:32-35.

38. Third, PO’s expert argues that “Watters does not contain any disclosure of using a ‘last satellite position’ to determine when to power on its GPS module.” Ex-2001 ¶38. PO’s expert also argues that “[t]he position of the GPS receiver (i.e., a mobile device) is not dependent on the positions of any GPS satellites.” *Id.* PO’s expert argues that this is because “a GPS receiver would report the same GPS position (because it has not moved) at any time during the day, even though the GPS satellites have moved.” *Id.* ¶40. This completely ignores the portions of Watters that teaches the opposite. There can be no reasonable dispute that Watters teaches to determine position with GPS that is also dependent on GPS satellites. The background discussion for the patent, e.g., in columns 1 and 2,

describes how GPS coordinates are calculated based on the positions of, and ranging information from, at least 4 satellites. *See generally*, Ex-1005, 1:13-2:67. For example, Watters explains that GPS satellites include navigation messages, in which “[t]he navigation data messages enable the receiver to ***calculate the position of each satellite*** at the time the signals were transmitted.” *Id.*, 2:25-28. PO is wrong when it argues that Watters does not include these teachings and PO’s expert is also wrong when he argues that the GPS receiver is not dependent on the position of GPS satellites. Anyone with an understanding of GPS technology would understand that GPS receivers are entirely dependent on the signals from GPS satellites, and the position of these satellites in their orbits, to determine position. A POSITA would have understood that the last position determined by the GPS receiver is dependent on the positions of at least four GPS satellites and is thus based on “a last satellite position.” As explained in my prior declaration, four satellite signals allow “the determination of position in three dimensions, and the current GPS time.” Ex-1002 ¶43. Furthermore, the last “orbital positions of the satellites” are necessary to use the pseudoranges of the satellites in order to calculate the position of the receiver in three dimensions. *Id.* ¶47.

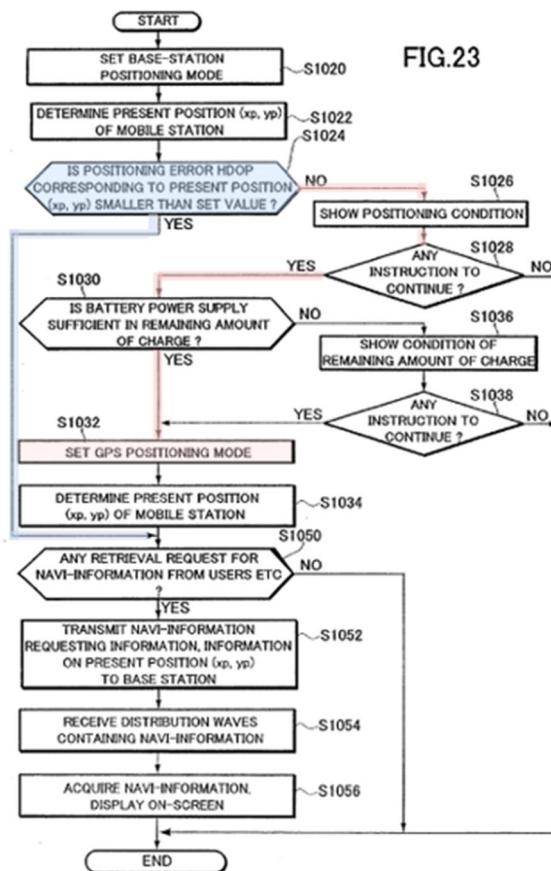
VIII. THE ARGUMENTS AGAINST GROUND 2 FAILS

A. Claims 37, 40, and 43 Are Obvious Over Nohara

39. My prior declaration applied both Watters’s and Nohara’s teachings

together in Ground 4 because the combination teaches to use both a “current radio position” and a “position error” to turn back on GPS-based positioning. But, in Ground 2, which applies the “disjunctive” view adopted by PO, Nohara’s teaching to use “position error” alone teaches these claims.

40. There is no dispute that Nohara teaches to calculate position errors and turn on GPS in view of such errors. For example, as shown in Figure 23 and discussed in my prior declaration, Nohara teaches powering on the GPS module when the positioning error HDOP threshold is exceeded. Ex-1006, Fig. 23.

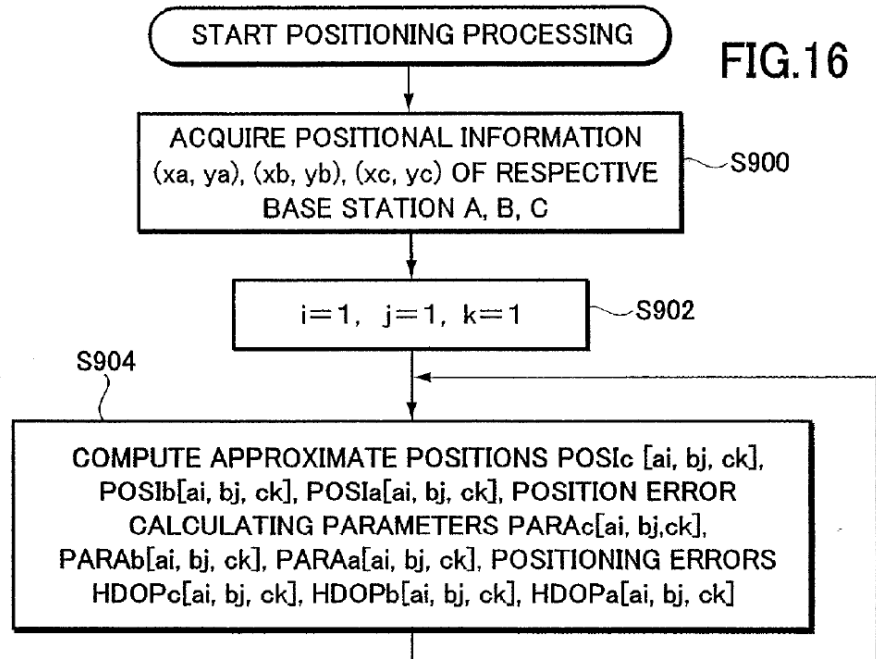


Nohara teaches that “[a]t step S1024 above, if the positioning error HDOP

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, . . . favorable positioning precision has not been obtained . . .” *Id.*

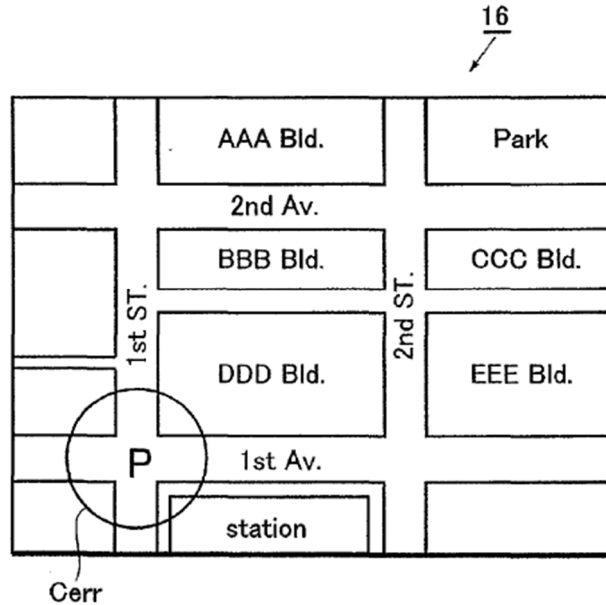
¶310. In this step, Nohara further teaches that “an instruction to continue the positioning operations is given, . . . go to step S1030” at step 1028 (*id.* ¶311), and then a battery check for the remaining amount of charge is determined at step 1030 (*id.* ¶312). Once these steps are completed, “[i]f the remaining amount of charge is sufficient (if ‘YES’), [it] enter[s] step S1032 [GPS positioning mode,] to set a positioning mode of using the GPS for positioning.” *Id.* While in the GPS positioning mode, “control unit 18 supplies the battery power supply . . . to the GPS receiving unit 36.” *Id.* ¶315. Thus, Nohara teaches that if the current position error is too high, then the GPS module is powered on (at step 1032).

41. Indeed, multiple figures in Nohara, and supporting descriptions in the specification, provide express teachings of how to calculate position errors. *See, e.g.,* Ex-1006, Figs. 8, 10, 12, 15(b), 16, 23. As just one example, an excerpt from Figure 16 below shows the process of using “actual position information” and “approximate positions” based on “positioning errors”:



42. As an additional example, Nohara teaches converting positioning error HDOP into a “range” to be displayed on a map so that a user can “check for the degree of precision” in an estimated position. Specifically, Nohara teaches that “[i]f 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.” Ex-1006 ¶160. This is illustrated below in Figure 15(b). *Id.*, 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.” *Id.* ¶160.

FIG.15 (b)



43. All of these teachings of Nohara, which expressly refer to “positioning error” and which create error circles “Cerr” shown on a map, are plainly position error teachings. And this approach would have been well understood by a POSITA.

44. In responding to Nohara, Dr. Pullen argues that “‘HDOP’ of Nohara is not a ‘position error’ in the way a POSITA would understand the term.” Ex-2001 ¶41. PO’s expert states that this is because Dilution of Precision measurements “are not a measurement of the actual error in position of a mobile device.” *Id.* ¶43. PO’s expert’s understanding of position error is based on his incorrect construction of the term “position error” as explained in Section VI.B. Nohara could not be clearer on this point: “[t]he *value HDOP will be called ‘positioning error.’*” Ex-

1006 ¶147. Furthermore, as shown below and discussed in my initial declaration, a mathematical expression is used to quantify position errors associated with Nohara’s cellular positioning technique. *Id.* ¶144.

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

In the mathematical expression, the “root-sum-square value HDOP (Horizontal Dilution of Precision) of the terms σ^2_{xx} and σ^2_{yy} is determined” and Nohara explains that the “value HDOP shall be regarded as the positioning error quantified on the plane in the horizon system of coordinates.” *Id.* Thus, a POSITA would have understood that value HDOP is “position error” as explicitly stated in Nohara.

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 that Nohara’s equation 9 suggests “having units of distance squared.” *Id.* This

teaches the position error term even under Dr. Pullen's narrow view. PO's expert has no meaningful response, and instead argues that Nohara's express teaching are "inconsistent with the conventional, dimensionless definition of HDOP." *Id.* ¶50. PO's expert seems to be arguing that Nohara's express disclosures and teachings are wrong but points to nothing in Nohara suggest otherwise. Ex-1043, 89:5-13, 90:3-19.

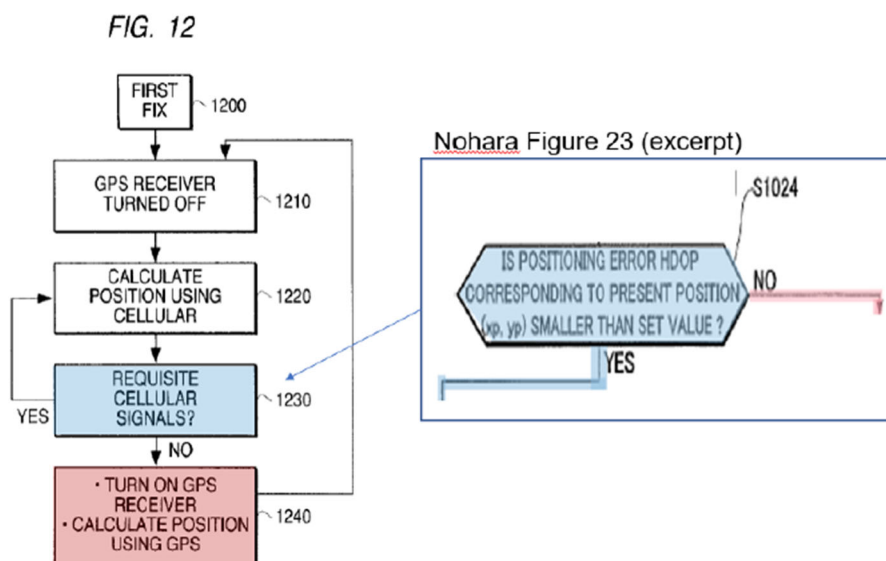
IX. THE ARGUMENTS AGAINST GROUND 4 FAILS

A. Claims 37-45 Are Obvious Over Watters in View of Nohara

46. PO states that because "the HDOP of Nohara is not a position error as a POSITA would understand the term, neither Watters nor Nohara, alone or in combination, anticipates or render obvious Claims 37-45." POR, 27-28. But neither PO nor its expert provided any analysis on the combination of Watters in view of Nohara under the "conjunctive" view presented in this ground. Ex-1043, 93:2-20.

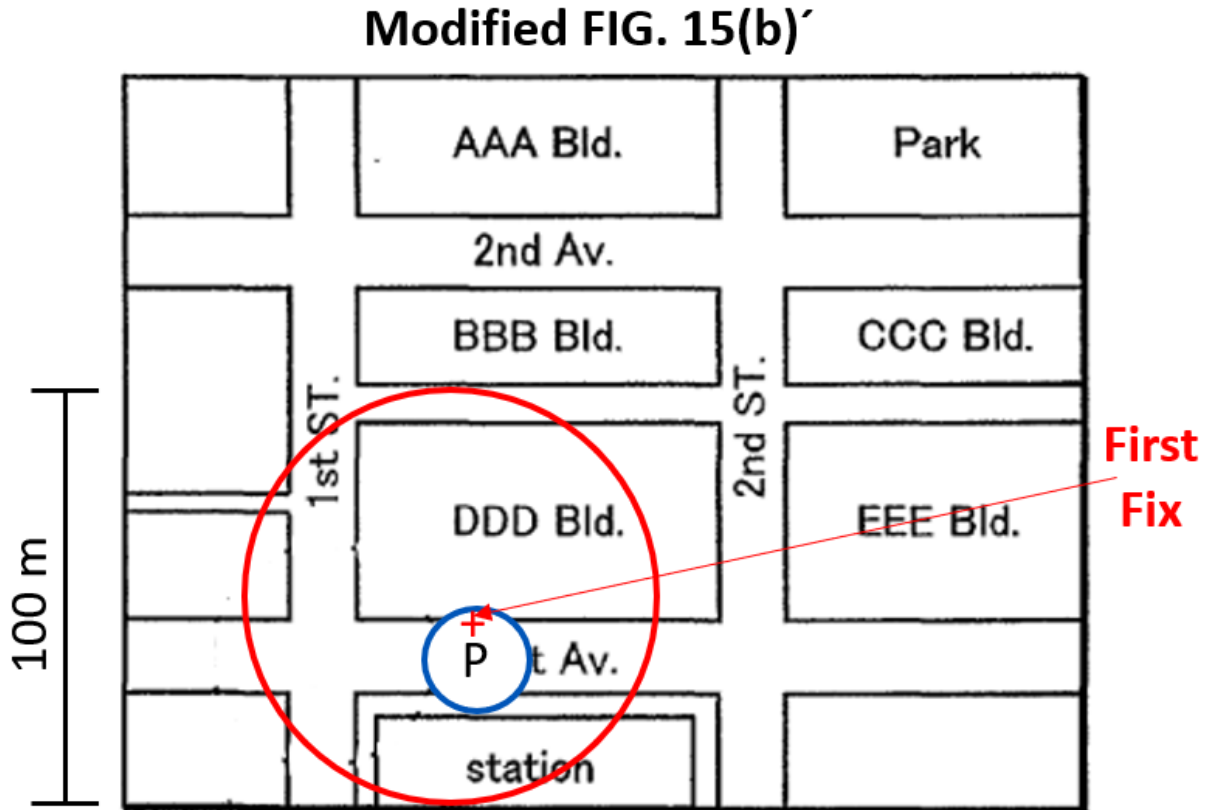
47. The Petition applied both Watters's and Nohara's teachings together because the combination teaches to use both a "current radio position" and a "position error" to turn GPS-based positioning back on, satisfying the conjunctive view of these claims. A POSITA would have been motivated to implement Nohara's technique of quantifying "position error HDOP" with Watters's use of position and accuracy in determining when to power on the GPS. Ex-1002 ¶¶172-

173. Specifically, as shown below, a POSITA would have implemented Nohara's position error (HDOP) calculation in Watters's step 1230, which determines whether the "requisite" signal is sufficient for positioning purposes. *Id.* ¶172.



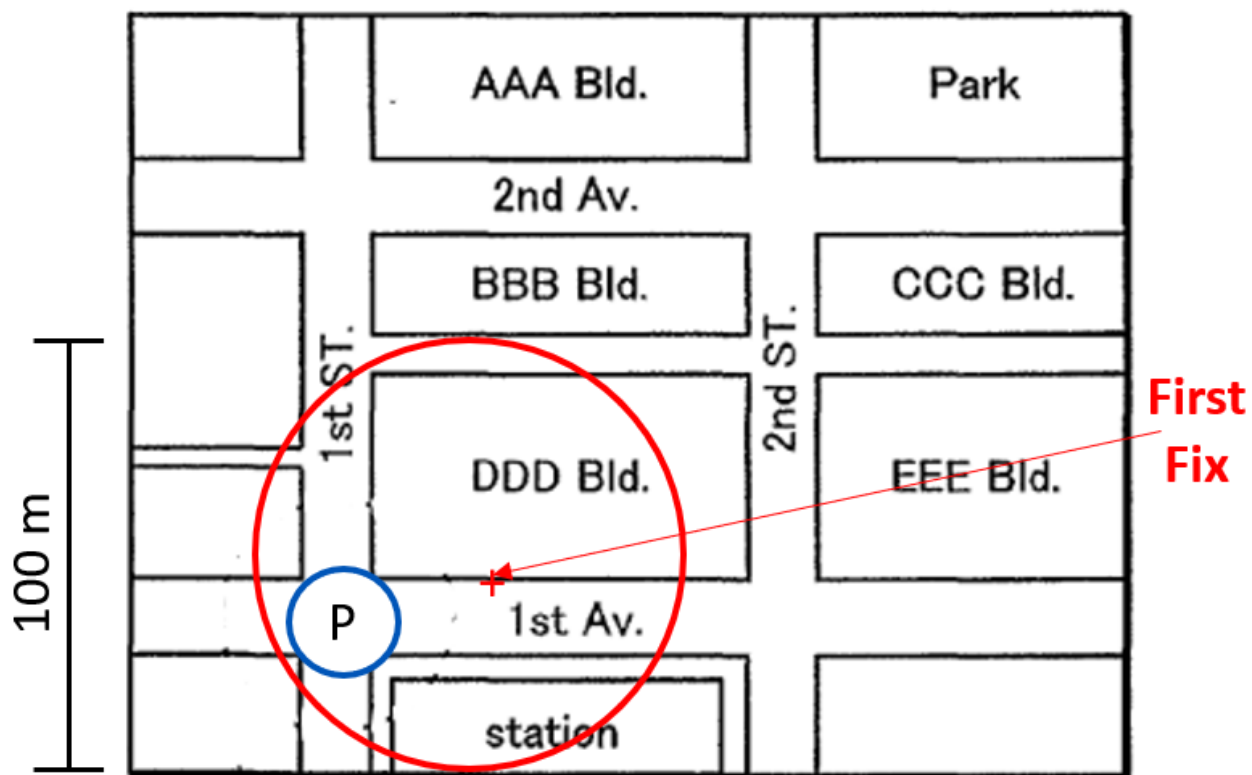
48. A POSITA would have also implemented Nohara's teaching of converting position error HDOP to the radius of an error circle "Cerr" around the present position. Ex-1006 ¶160. For example, in the combined Watters-Nohara implementation, the evaluation of whether the distance threshold has been reached would depend on the current radio position (Watters's current radio position used to evaluate whether the distance threshold is crossed) and position error (Nohara's HDOP) as discussed in Sections VII.A and VIII.A. Pet., 65-66. For example, Watters teaches that the starting position is the position determined by GPS at a prior time. Ex-1005, 22:47-48 (referring to Figure 12 (1200)). The starting position (P with a blue "Cerr" radius around it) is shown below in Nohara's modified

Figure 15(b)' as leaving the DDD building. A "first fix" GPS measurement is taken at that time (the red +). As Watters explains, GPS does not need to be turned back on until the traveler is about 100 meters from the GPS first Fix (red circle).



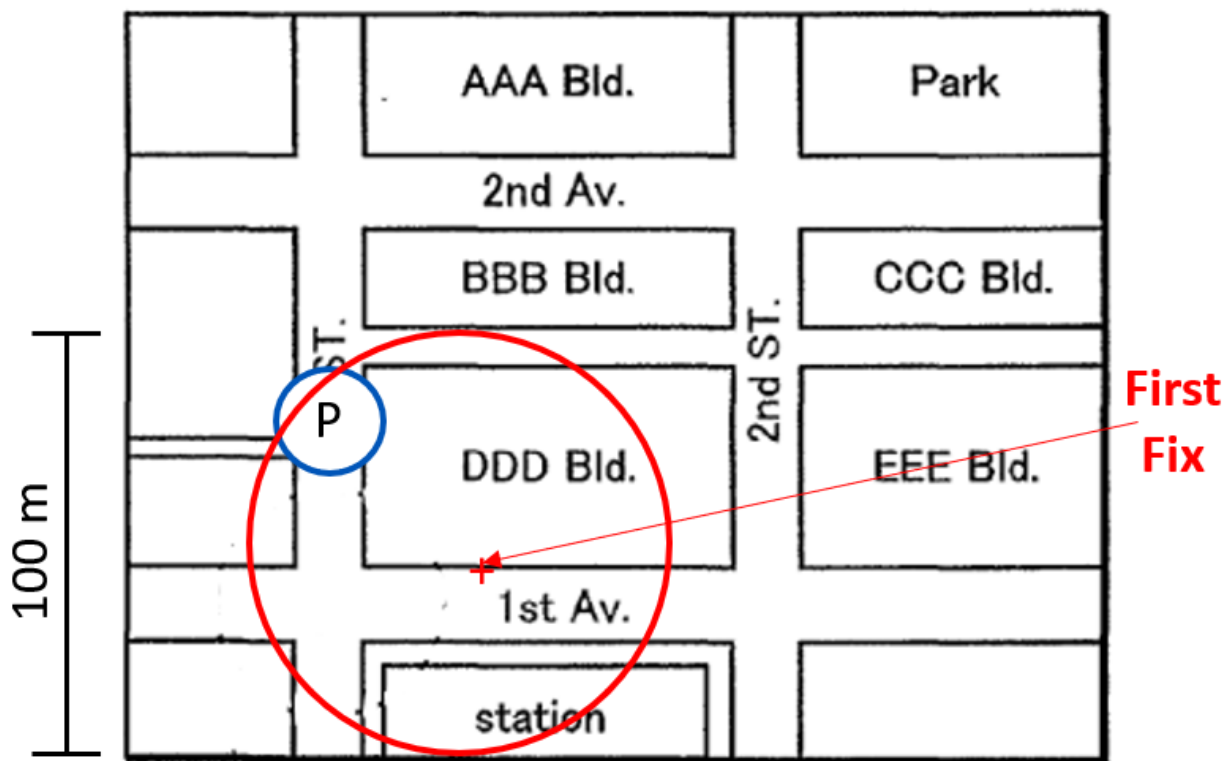
49. At a later time, the traveler has proceeded west to the intersection of 1st ST. and 1st Av. Both P and the blue error circle around P remain within 100m of the GPS first fix, so the GPS need not yet turn on.

Modified FIG. 15(b)'

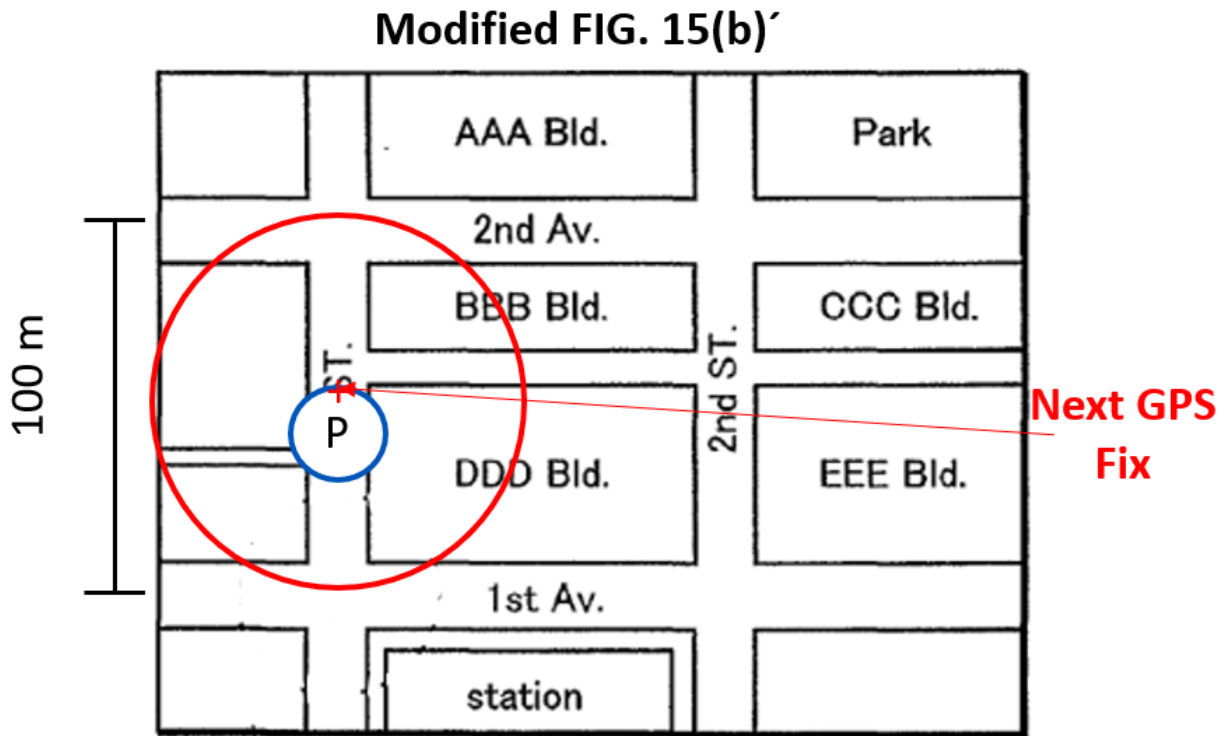


50. At a still later time, the traveler has turned north, the blue error circle around P has exceeded the 100m threshold from the GPS first fix. In the combined Watters-Nohara teaching, the GPS receiver would turn on to get a new position fix, because the position, with the position error estimate around it, may be outside the desired distance from the last GPS fix.

Modified FIG. 15(b)'



51. Watters explains that if “the mobile terminal has moved a predetermined distance, such as 100 meters” as shown below, the GPS is turned on and used to obtain the current position of the device. Ex-1005, 22:61-64 (referring to Figure 12 (1240)). Thus, using this combined Watters-Nohara technique, both a “current radio position” (from Watters) and a “position error” (from Nohara) would be determined and used to turn back on GPS and get a new fix.



52. Thus, Watters in view of Nohara teaches the requirements of the claims.

X. THE ARGUMENTS AGAINST GROUNDS 3 AND 5 FAIL

A. Claims 38, 41, and 44 Are Obvious Over Watters in View of Lau

53. PO's expert does not independently dispute the prior art grounds raised against Claims 38, 41, and 44. Those remaining claims and grounds thus stand undisputed.

B. Claims 38, 41, and 44 Are Obvious Over Watters and Nohara in Further View of Lau

54. PO's expert does not independently dispute the prior art grounds raised against Claims 38, 41, and 44. Those remaining claims and grounds thus

stand undisputed.

XI. CONCLUSION

55. I declare that all statements made herein of my knowledge are true, that all statements made on information and belief are believed to be true, and 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.

56. I declare under penalty of perjury that the foregoing is true and correct.

Respectfully submitted,

October 7, 2024



Scott Andrews