

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner

v.

GEOSCOPE TECHNOLOGIES PTE. LTD.
Patent Owner

Case No. IPR2023-01213
Patent 9,097,784

**DECLARATION OF DAVID H. WILLIAMS IN SUPPORT OF
PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 9,097,784**

Declaration of David H. Williams In Support of
Petition for *Inter Partes* Review of U.S. Patent No. 9,097,784

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Exhibit No.	Description
1001	U.S. Patent No. 9,097,784, issued on July 14, 2009 (“the ’784 Patent”)
1002	File History of U.S. Patent Application No. 14/518,868, filed on October 20, 2014 (“the ’868 Application”)
1003	U.S. Provisional Application No. 60/899,379, filed on February 5, 2007
1004	U.S. Patent No. 6,381,533, issued on April 30, 2002 to A. Crane <i>et al.</i> (“Crane”)
1005	U.S. Patent Publication No. 2003/0064735, published on April 3, 2003 to D. Spain <i>et al.</i> (“Spain”)
1006	Amendment filed in U.S. Patent Application No. 12/026,372 on July 28, 2014
1007	Amendment filed in U.S. Patent Application No. 12/026,372 on October 3, 2014
1009	<i>Curriculum Vitae</i> of David Hilliard Williams
1010	Geoscope’s Preliminary Infringement Contentions dated April 7, 2023 (without appendices), <i>Geoscope Technologies Pte. Ltd. v. Google LLC f/k/a Google Inc.</i> , Civ. Action No. 1:22-cv-01331 (EDVA)
1011	Appendix E to Geoscope’s Preliminary Infringement Contentions dated April 7, 2023, <i>Geoscope Technologies Pte. Ltd. v. Google LLC f/k/a Google Inc.</i> , Civ. Action No. 1:22-cv-01331 (EDVA)
1012	Complaint dated November 22, 2022, <i>Geoscope Technologies Pte. Ltd. v. Google LLC f/k/a Google Inc.</i> , Civ. Action No. 1:22-cv-01331 (EDVA) filed on November 22, 2022 (“the Related Litigation”)

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Exhibit No.	Description
1016	Difference comparison between the text of the Specifications of the Dressler and Spain
1017	U.S. Patent No. 7,433,695, issued on October 7, 2008 to S. Gordon <i>et al.</i> (“Gordon”)
1018	U.S. Patent No. 7,561,104, issued on July 14, 2009 to M. Alles <i>et al.</i> (“the ’104 patent”)
1019	File History of Reexamination Control No. 90/012,694 (“the ’694 Reexamination”)
1020	Difference comparison between the text of the Specifications of the Gordon and Spain
1021	U.S. Patent No. 7,460,505, issued on December 2, 2008 to D. Spain (“the ’505 Patent”)
1022	Difference comparison between the text of the Specifications of the ’505 Patent and Spain
1023	Supplemental Stipulation Regarding Agreed Upon Claim Constructions dated May 25, 2023, <i>Geoscope Technologies Pte. Ltd. v. Google LLC f/k/a Google Inc.</i> , Civ. Action No. 1:22-cv-01331 (EDVA) filed on November 22, 2022
1027	Second Supplemental Stipulation Regarding Agreed Upon Claim Constructions dated July 10, 2023, <i>Geoscope Technologies Pte. Ltd. v. Google LLC f/k/a Google Inc.</i> , Civ. Action No. 1:22-cv-01331 (EDVA) filed on November 22, 2022
1028	Claim Construction Memorandum Opinion & Order dated July 19, 2023, <i>Geoscope Technologies Pte. Ltd. v. Google LLC f/k/a Google Inc.</i> , Civ. Action No. 1:22-cv-01331 (EDVA) filed on November 22, 2022

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I, David H. Williams, hereby state as follows:

I. INTRODUCTION

1. I have been retained by Google LLC (“Petitioner”) as an independent expert consultant in this *inter partes* review (“IPR”) proceeding before the United States Patent and Trademark Office (“PTO”).

2. I have been asked by Counsel for Petitioners (“Counsel”) to consider whether certain references teach or suggest the features recited in Claims 1, 2, 10-13, 21, and 22 (“the Challenged Claims”) of U.S. Patent No. 9,097,784 (“the ’784 Patent”) (EX1001). My opinions and the bases for my opinions are set forth below.

3. I am being compensated at my ordinary and customary consulting rate for my work, which is \$485 per hour. My compensation is in no way contingent on the nature of my findings, the presentation of my findings in testimony, or the outcome of this or any other proceeding. I have no other financial interest in this proceeding.

II. BACKGROUND AND QUALIFICATIONS

4. All of my opinions stated in this declaration are based on my own personal knowledge and professional judgment. In forming my opinions, I have relied on my knowledge and experience in designing, developing, researching, and teaching the technology referenced in this declaration.

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5. I am over 18 years of age and, if I am called upon to do so, I would be competent to testify as to the matters set forth herein. I understand that a copy of my current curriculum vitae, which details my education and professional and academic experience, is being submitted as EX1009. The following provides a brief overview of some of my experience that is relevant to the matters set forth in this declaration.

6. I have over 30 years of experience in wireless location services, including experience implementing Wireless 911 (E911) systems and designing, implementing, and managing numerous location-based service (LBS) applications such as family tracking and fleet and asset management. I am currently the President of the company E911-LBS Consulting, and I have been with the company since 2002. As the President of E911-LBS Consulting, I provide services across the entire wireless value chain, particularly with respect to technology and business strategic planning and product design and development associated with LBS, Global Positioning Satellite (GPS) systems, E911, Real-Time Location Systems (RTLS), Radio Frequency Identification (RFID), beacon, and other location determination and sensing technologies and services.

7. I have extensive expertise in all aspects of LBS delivery across the wireless location ecosystem including enabling network, map data, geospatial platform, chipset, data management, device, and location determination

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infrastructure and integration providers. I am an expert in all related aspects of LBS, including data privacy and security management.

8. For example, I managed the development and launch of several consumer-oriented LBS applications including mobile social networking, family tracking and local search for a major wireless carrier (AT&T). This work included the development of corporate-wide location data privacy policies and their systemic implementation for all LBS customers. My work in both data privacy and mobile social networking resulted in my co-inventing a patent in this field. I also have several other patents related to mobile location and associated applications and architectures.

9. I also have significant experience related to E911 systems. For example, in 2003-2004, I consulted with AT&T Wireless on their implementation of E911 systems. Specifically, I led the development of implementation and monitoring of systems in AT&T Wireless Western Region as part of their deployment of TDOA (Time Difference of Arrival) non-GPS E911 network location infrastructure to meet the wireless E911 location requirements mandated by the FCC. In 2004-2005, I worked with NAVTEQ, a key provider of LBS and E911 location map data, in developing their application developer ecosystem and website, providing developers with access to all of NAVTEQ's product and technical

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resources for developing location-related applications, including data products involving 911 GIS (Geographical Information Systems).

10. I have authored multiple books on wireless location, including:

- The Definitive Guide to GPS, RFID, Wi-Fi, and Other Wireless Location-Based Services (2005 and 2009 versions);
- The Definitive Guide to Wireless E911; and
- The Definitive Guide to Mobile Positioning and Location Management (coauthor).

11. I received a B.S. degree, in Electrical Engineering, from Purdue University in 1983. I received a MBA degree, in Information Systems Management, from The University of Texas at Austin in 1987.

III. INFORMATION CONSIDERED

12. In preparing this declaration, I have considered the materials discussed herein, including, for example, the '784 Patent, the references cited by the '784 Patent, the prosecution histories of the '784 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. In addition, my opinions are further based on my education, training, experience, and knowledge in the relevant field.

IV. RELEVANT LEGAL STANDARDS

13. 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, as summarized below.

A. Claim Interpretation

14. I have been informed that during an *inter partes* review proceeding, claims are to be construed in light of the specification as would be read by a person of ordinary skill in the relevant art at the time the application was filed. I have been informed that claim terms are given their ordinary and customary meaning as would be understood by a person of ordinary skill in the relevant art in the context of the entire disclosure. A claim term, however, will not receive its ordinary meaning if the patentee acted as his own lexicographer and clearly set forth a definition of the claim term in the specification. In that case, the claim term will receive the definition set forth in the patent.

15. I have been informed that certain patent claim terms may be interpreted as “means-plus-function” claim terms. I have been informed that terminology is part of the U.S. Patent Law in 35 USC §112, paragraph 6 (pre-AIA) / 35 USC § 112(f) (post-AIA), which states the following: “An element in a claim for a combination may be expressed as a means or step for performing a specified function without the

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recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.”

B. Perspective of One of Ordinary Skill in the Art

16. I have been informed that a patent is to be understood from the perspective of a hypothetical “person of ordinary skill in the art” (“POSITA”). Such an individual is considered to possess normal skills and knowledge in a particular technical field (as opposed to being a genius). I have been informed that in considering what the claims of a patent require, what was known prior to that patent, what a prior art reference discloses, and whether an invention is obvious or not, one must use the perspective of such a POSITA.

C. Anticipation

17. I have been informed that a claim is not patentable if it is anticipated. I have been informed that anticipation of a claim requires that every element of a claim is disclosed expressly or inherently in a prior art reference, arranged as in the claim, when considered from the perspective of a person of ordinary skill in the relevant art. I have been informed that when the structure recited in a reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. I have been informed that extrinsic evidence may be used

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to explain but not expand the meaning of terms and phrases used in the reference relied upon as anticipatory of the claimed subject matter.

D. Obviousness

18. I have been informed that a patent claim is obvious under 35 U.S.C. § 103, and therefore invalid, if the claimed subject matter, as a whole, would have been obvious to a POSITA as of the priority date of the patent based on one or more prior art references and/or the knowledge of a POSITA.

19. I have been informed that an obviousness analysis must consider (1) the scope and content of the prior art, (2) the differences between the claims and the prior art, (3) the level of ordinary skill in the pertinent art, and (4) secondary considerations, if any, of non-obviousness (such as unexpected results, commercial success, long- felt but unmet need, failure of others, copying by others, and skepticism of experts).

20. I have been informed that a prior art reference may be combined with other references to disclose each element of the invention under 35 U.S.C. § 103. I have been informed that a reference may also be combined with the knowledge of a POSITA, and that this knowledge may be used to combine multiple references. I have been informed that a POSITA is presumed to know the relevant prior art. I have

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been informed that the obviousness analysis may take into account the inferences and creative steps that a POSITA would employ.

21. In determining whether a prior art reference would have been combined with other prior art or other information known to a POSITA, I have been informed that the following principles may be considered:

- whether the references to be combined involve non-analogous art;
- whether the references to be combined are in different fields of endeavor than the alleged invention in the Patent;
- whether the references to be combined are reasonably pertinent to the problems to which the inventions of the Patent are directed;
- whether the combination is of familiar elements according to known methods that yields predictable results;
- whether a combination involves the substitution of one known element for another that yields predictable results;
- whether the combination involves the use of a known technique to improve similar items or methods in the same way that yields predictable results;
- whether the combination involves the application of a known technique to a prior art reference that is ready for improvement, to yield predictable results;
- whether the combination is “obvious to try”;
- whether the combination involves the known work in one field of endeavor prompting variations of it for use in either the same field or a different one based on design incentives or other

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market forces, where the variations are predictable to a POSITA;

- whether there is some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill in the art to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention;
- whether the combination requires modifications that render the prior art unsatisfactory for its intended use;
- whether the combination requires modifications that change the principle of operation of the reference;
- whether the combination is reasonably expected to be a success; and
- whether the combination possesses the requisite degree of predictability at the time the invention was made.

22. I have been informed that in determining whether a combination of prior art references renders a claim obvious, it is helpful to consider whether there is some teaching, suggestion, or motivation to combine the references and a reasonable expectation of success in doing so. I have been informed, however, that a teaching, suggestion, or motivation to combine is not required.

V. SUMMARY OF OPINIONS

23. It is my opinion that Claims 1, 2, 10-13, 21, and 22 of the '784 Patent are unpatentable under 35 U.S.C. §103 on the following ground:

Ground	Reference(s)	Basis	Claims
1	U.S. Patent No. 6,381,533 (“Crane”) (EX1004); U.S. Patent Publication No. 2003/0064735 (“Spain”) (EX1005)	§ 103	1, 2, 10-13, 21, and 22

VI. TECHNOLOGY BACKGROUND

24. The '784 Patent discloses a “system and method to collect and modify calibration data.” EX1001, title. According to the '784 Patent, “[c]alibration data measured via a calibration data collection device may contain errors due to the physical limitations of the collection device and/or the collection process. Any data collection device may produce some degree of signal degradation or drop-out.” EX1001, Abs. ll. 2-5.

25. The '784 Patent acknowledges that “[d]ead reckoning provides a remedy for signal drop-out, however, it often produces data results that may be unsatisfactory to perform an accurate location estimate.” EX1001, Abs. ll. 6-9. Thus, the '784 Patent seeks to improve “integrity of the collected calibration data.” EX1001, Abs. ll. 9-10.

26. The '784 Patent purports to provide improved methods for collecting and modifying calibration data by, inter alia, “[e]nhancing the collected calibration data” or “generating a calibration database using enhanced collection procedures” to “reduce the chances of error occurring during a subsequent location process.” EX1001, 2:4-7.

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27. The '784 Patent notes that collection of calibration data in “a geographical area that contains multiple streets, highways, etc. having corresponding intersections” may result in “collecting erroneous location point data regardless of the type of data collection device. A street database may be used as a supplemental data source to compare and/or check the integrity of collected location data.” EX1001, 3:39-44.

28. Thus, the '784 Patent proposes “using the locations of streets in an area (and ancillary information about those streets) as supplemental information to check the integrity of the calibration data.” EX1012, ¶ 66.

29. Patent Owner (“Owner”) alleges that the '784 Patent “expressly recites this inventive feature of using supplemental street information to generate a more accurate database of calibration data.” EX1012, ¶ 69.

30. “The street database data may be stored in the same database [] used to store the collected ground truth data or may be stored in a separate database.” EX1001, 3:48-50.

31. Accordingly, the '784 Patent teaches that “[g]round truth data observed from a data collection device (*i.e.*, a GPS receiver) may be collected and stored in a calibration database and compared to a street database to modify and enhance the

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calibration data for increased accuracy. Increasing the accuracy of the ground truth data may in turn provide more accurate location results.” EX1001, 3:23-28.

32. The ’784 Patent explains exemplary ways in which a “street database” can provide enhanced data. *See* EX1001, 4:7-67.

33. The ’784 Patent discloses comparing a progression of measurements to a likely path derived from a street database showing, *e.g.*, “the direction of one-way streets, off-street territories, etc.” EX1001, 3:47-48; *see* 3:39-50, 4:19-28.

34. The ’784 Patent describes associating, or matching, supplemental information—*e.g.*, “latitude, longitude and other forms of geographical location data” and “ancillary information such as the direction of one-way streets, off-street territories, etc.”—“to the collected location data.” EX1001, 3:45-62.

VII. THE CHALLENGED ’784 Patent

35. The ’784 Patent contains 22 claims. I have been asked to opine on the validity of Claims 1, 2, 10-13, 21, and 22.

VIII. THE ’784 Patent PROSECUTION HISTORY

36. I have reviewed the file history of the ’784 Patent. The Examiner did not mail any Official Actions rejecting the claims of the ’784 Patent during Examination. A Notice of Allowance was mailed on June, 19, 2015 allowing all

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pending claims. Claims 1 and 12 of the '784 Patent included an Examiner's Amendment.

37. The Examiner and Owner conducted a telephonic Examiner-Initiated Interview on June 4, 2015. EX1002, p.30. During the interview, the Examiner and Owner discussed a proposed Examiner Amendment to independent Claims 1 and 12 of the '784 Patent to put the application in condition for allowance. The Examiner cited and discussed U.S. Pub. No. 2008/0070572 to Shkedi ("Shkedi"). *Id.* The Examiner Amendment proposed during the interview and eventually recited in the Notice of Allowance amended independent Claim 1 to recite "determining from said status a most likely one of said plural streets upon which said wireless device is ~~sited~~ for a first one of said plural geographic locations located; determining said most likely street as a first one of said plural geographic locations; . . ." EX1002, pp.25-26. Independent Claim 12 contained a similar amendment.

38. The Examiner mailed a Notice of Allowance on June 19, 2015. The Notice of Allowance outlines the Examiner's Amendment and the Examiner's Reasons for Allowance. According to the Examiner, "prior art was found teaching the inventive concept of collecting location fingerprints (*~claimed location data*) and GPS coordinates both corresponding to the same location and associating them in a database for calibration purposes (*see US 2008/0070572 [Shkedi], paragraph*

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54).” EX1002, p.27. The Examiner found that “Shkedi fails to teach” the four “determining” steps of the independent claims as well as the step reciting “entering . . . **with the first point.**” EX1002, pp.27-28.

39. Thus, the Examiner found all claims of the ’784 Patent allowable with the Examiner’s Amendment. EX1002, p.28.

IX. LEVEL OF ORDINARY SKILL IN THE ART

40. A POSITA would have been someone knowledgeable in wireless networks, cellular radio systems, mobile communication devices and radio navigation systems. That person would have at least a bachelor’s degree in electrical engineering, with a background in radio frequency communications and/or navigation system technology as well as approximately two years of industry experience working on radio communication and/or navigation systems.

X. PRIORITY DATE

41. I have been informed that the “priority date” or “earliest effective filing date” of a patent is the date on which it is filed, or the date on which an earlier-filed U.S. or international patent application was filed if the patentee claims the benefit of priority to that earlier-filed U.S. or international patent application. The ’784 Patent issued from U.S. Patent Application No. 14/518,868, filed on October 20, 2014, which is a continuation of U.S. Patent Application No. 12/026,372 filed on February

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5, 2008, and claims priority to U.S. Provisional Application No. 60/899,379 (EX1003) filed on February 5, 2007. For purposes of this declaration, I have assumed that the '784 Patent is entitled to a priority date of February 5, 2007, and I have not evaluated or formed an opinion on whether the claims of the '784 Patent are actually entitled to that date.

XI. CLAIM CONSTRUCTION

42. For purposes of my analysis in this IPR proceeding, I have been informed that terms that appear in the claims of the '784 Patent should be interpreted according to their plain and ordinary meaning under the *Phillips* standard. In determining the ordinary and customary meaning, I have been informed that the words of a claim are first given their plain meaning that those words would have had to a POSITA at the time of the alleged invention. I also have been informed that the claims, specification, and file history may be used to better construe a claim insofar as the plain meaning of the claims cannot be understood. I have been informed that even treatises and dictionaries may be used under limited circumstances to determine the meaning attributed by a POSITA to a claim term at the time of filing.

43. I also understand that, for terms that evoke a means plus function construction, “the construction of the claim must identify the specific portions of the specification that describe the structure, material, or acts corresponding to each

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claimed function.” 37 C.F.R. §42.104(b)(3). I understand from counsel that construing a means-plus-function claim term is a two-step process that includes (1) identifying the claimed function and (2) then determining what structure, if any, disclosed in the specification corresponds to the claimed function.

44. I have reviewed the '784 Patent and its prosecution history as well as additional documents to construe the claims for performing my validity analysis. It is my understanding that some terms of the '784 Patent are in dispute and a Markman Order (EX1028) issued in Related Litigation addressing those disputes construing claim terms. Below is a summary of claim constructions I have made for purposes of evaluating the Challenged Claims of the '784 Patent.

A. “wireless device”

45. I have construed the term “wireless device” as a device capable of transmitting and receiving signals while unattached to any physical wires.

46. This construction is consistent with the Markman Order. *See* EX1028, p.32.

47. A wireless device “may include a wireless transmitter, radio frequency transmitter, mobile telephone, cellular telephone, text messaging device, portable computer, laptop computer, personal digital assistant, vehicle security device, vehicle tracking device and pager.” EX1001, 5:40-43.

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48. I believe Petitioner's construction is consistent with the specification, claims, and prosecution history of the '784 Patent. EX1001, 1:17-24. For example, the '784 specification discloses "wireless communication devices" collectively referred to as "mobile appliances" or "mobile stations". EX1001, 1:17-20. This construction is consistent with Owner's construction.

49. I am also aware that Owner's Preliminary Infringement Contentions (EX1010, EX1011) appear to construe "mobile station" and "wireless device" as encompassing a single device (*e.g.*, the same device) performing the same functions of the claims, *i.e.*, a smartphone. EX1011, p.2, 1[b].

B. "status of said wireless device"

50. I have construed the term "status of said wireless device" as information regarding the movement or orientation of the wireless device.

51. I am aware that in the Related Litigation, Petitioner and Owner stipulated that "status of said wireless device" should be construed as "information regarding the movement or orientation of the wireless device." EX1023, p.1.

52. The "status" may encompass an attribute used to determine a most likely one of said plural streets upon which the wireless device is located.

53. I believe this is consistent with the claims and specification of the '784 Patent. For example, "[t]he status of a wireless device may be determined (905), and

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based upon the status, a most likely street upon which the wireless device is sited may be determined as the geographic location (907).” EX1001, 8:63-66. Claim 11 recites “wherein said status includes attributes selected from the group consisting of: direction of travel; speed of travel, and change in direction of travel.” EX1001, 10:7-9.

C. “determining said most likely street as a first one of said plural geographic locations”¹

54. It is my understanding that, in Related Litigation, the District Court determined this term is indefinite. *See* EX1028, pp.28-30. It is also my understanding that Petitioner does not directly construe this term for this Petition. Petitioner recognizes that this term encompasses the prior art of record, although the bounds of the term are not reasonably certain.

55. It is my understanding that for purposes of this Petition, Petitioner recognizes that this term encompasses “determining a street upon which a wireless device is most likely located as a first geographic location of a geographic region,”

¹ I am aware that in the Related Litigation, Petitioner asserts that this term is indefinite. I do not directly construe this term. I recognize this term to encompass the prior art of record, although the bounds of the term are not reasonably certain to a POSITA.

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although the bounds of the term are unclear. Accordingly, the Grounds show where this phrase may be found in the prior art.

D. “determining a first point of said plural points that is in proximity to said first geographic location”²

56. It is my understanding that, in Related Litigation, the District Court determined the term “in proximity” is indefinite. *See* EX1028, pp.24-28. It is also my understanding that Petitioner does not directly construe this term for this Petition. Petitioner recognizes that this term encompasses the prior art of record, although the bounds of the term are not reasonably certain.

57. It is my understanding that for purposes of this Petition, Petitioner recognizes that this term encompasses “determining a point of the location information database that is in proximity to the first geographic location” and “in proximity” encompasses where the “first point” and “said first geographic location” match (*e.g.*, are the exact same location), although the bounds of this term and “in

² In Related Litigation, Petitioner asserts that the term “in proximity” is indefinite, as the bound are unclear. Petitioner recognizes that “in proximity” encompasses where the “first point” and “said first geographic location” match (*e.g.*, are the exact same location).

proximity” are unclear. Accordingly, the Grounds show where this term may be found in the prior art.

E. Order of “obtaining” and “determining” steps.

58. I am aware that in the Related Litigation Petitioner and Owner stipulated that the order of “obtaining” and “determining” steps of Claims 1 and 12 of the ’784 Patent should be construed as “‘obtaining . . .’ and ‘determining from said status . . .’ must occur before ‘determining said most likely street,’ which must occur before ‘determining a first point of said plural points. . .’” EX1027, p.1.

XII. OVERVIEW OF THE PRIOR ART REFERENCES

A. Crane (EX1004)

59. Crane discloses a data collection system and method for collecting geographic data, determining positions of wireless devices (*e.g.*, cellular phones), and matching the positions of the wireless devices to associated positions of roads in a geographic area. EX1004, 1:13-20.

60. Specifically, Crane discloses a method and system that “matches the position of one or more cellular phones” with “data indicating the locations of roads” in order to “derive data about phones located in vehicles traveling along the roads.” EX1004, 2:26-30.

61. “The data about phones . . . are used for updating or refining a geographic database.” EX1004, 2:30-32.

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62. Crane recognizes that “an existing geographic database for roads may be enhanced” such that “there exists a need to continue to collect information for a geographic database.” EX1004, 1:49-53.

63. Fig. 2 of Crane illustrates a phone location determining system 104 which outputs “data 140” which includes attributes such as “ID”, “TIME” and phone position (*e.g.*, latitude/longitude, or “LAT/LONG”) to a data collection system 200 of Fig. 4, wherein phone positions are matched to positions of roads 152 (Fig. 6) represented by Fig. 4 data 170 (*e.g.*, “LAT/LONG”) in the geographic database 172. EX1004, 3:57-63.

64. The “LAT/LONG” information provided by the phone determining system is determined using the illustrated Fig. 1 inputs from the towers 108 into the phone location determining system 104, in conjunction with “available technologies” such as cellular phone “911” phone location technology. EX1004, 3:7-13.

65. Crane states: “[a] geographic database can also be updated using the position data for a plurality of cellular telephones.” EX1004, 6:27-28.

66. Crane modifies data collected and stored in a database (*i.e.*, a calibration database) for increased accuracy in “cellular phone location matching.” EX1004, 6:46-58.

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67. Crane uses “data about phones” and “positions of cellular phones . . . to update the data that indicate the positions of roads that are already represented in the geographic database. Using the positions of cellular phones that travel along roads can help increase the accuracy of the data that represent the positions used to represent roads in the database.” EX1004, 6:46-52; *see* 2:30-33.

68. Crane produces a “database with new, more accurate data”. EX1004, 6:56-57.

69. Crane increases data accuracy by associating data representing locations of cellular phones with road data so that “the database with new, more accurate data can be used for subsequent cellular phone location matching.” EX1004, 6:56-58.

B. Spain (EX1005)

70. Spain discloses details of a method for determining the location of a mobile device (*i.e.*, a “mobile unit”) which works in areas where GPS coverage is not typically available to augment location determination performance. EX1005, ¶[0034].

71. Spain discloses determining the mobile device location by using a reference database containing multiple RF data entries. *See* EX1005, Abs. ll. 1-9, ¶¶[0047], [0052], [0062].

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72. Spain recognizes that determining the location of a mobile unit can be performed using “GPS receivers” and that, “[w]hen combined with differential corrections, the GPS accuracy can be improved.” EX1005, ¶[0003]:13-17.

73. Spain recognizes that GPS location is “not always reliable since the mobile unit may be in an environment where there is no penetration of GPS satellite signals.” EX1005, ¶[0004]:9-11.

74. For example, “it is well known that GPS receivers do not work very well in urban canyons and indoor locations where signal strength is very low.” EX1005, ¶[0033]:2-4.

75. Thus, Spain presents “a new method for determining the location of mobile unit 10 which (a) works in areas where GPS coverage is not typically available, and (b) does not require any infrastructure modifications.” EX1005, ¶[0034]:2-4.

76. To determine mobile device location, Spain uses an attribute of “observed signal strength” to generate a spectral fingerprint for the current location of the mobile unit. EX1005, ¶[0035]; *see* ¶[0041]:1-3.

77. The generated signal strength fingerprint is “transmitted” to a “database [] stored at [a] location server” over a “wireless link.” EX1005, ¶[0048]:1-4.

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78. Fingerprint matching to determine a location of a mobile phone may leverage “mobile unit motion constraints to generate multiple hypotheses for mobile unit locations over time.” EX1005, ¶[0061]:9-10.

79. Spain discloses that “fingerprint information along with the coordinates of the location are entered into the database.” EX1005, ¶[0100]:3-4.

80. Spain’s solutions for locating a mobile phone involve “many methods for building, managing and searching databases” that include “latitude and longitude of the location to which the fingerprint corresponds.” EX1005, ¶[0099]:6-9.

XIII. DETAILED EXPLANATION OF THE UNPATENTABILITY GROUNDS

81. In my opinion, the Challenged Claims are unpatentable over the prior art.

82. The following sections provide reference to where the elements of Claims 1, 2, 10-13, 21, and 22 are found in the prior art.

A. Preamble of Claim 1 is Disclosed in Crane

83. The Preamble of Claim 1 recites “[a] method for generating a calibration database, comprising.” Crane discloses the Preamble of Claim 1.³

³ It is my understanding that Petitioner does not concede that the Preamble is limiting.

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84. It is my understanding that the term “calibration” encompasses “associating location data for a most likely street upon which a wireless device is located with latitude and longitude information from a location information database.” *See* EX1001, Abs. ll. 1-2, 1:25-33, 9:15-42.

85. Crane discloses a geographic database which associates location data for a most likely street upon which a wireless device is located with a first point at which a wireless device is located and that is determined to be proximate to the location data. “In FIG. 4, a data collection system 200 uses the data 140 collected by the cellular phone location determining system 104 in conjunction with the data 170 from the geographic database 172 to generate new data 210. The data collection system 200 matches the acquired cellular phone position data 140 to the locations of roads 152 represented by the data 170 in the geographic database 172.” EX1004, 3:49-55.

86. Thus, the “database with new, more accurate data can be used for subsequent cellular phone location matching” [EX1004, 6:56-58], and constitutes the “calibration database” of the ’784 Patent’s Claim 1 Preamble.

87. The updated geographic database 172 which constitutes a “calibration database” of the ’784 Patent Preamble can also be used to “make derived database products.” EX1004, 6:62-63.

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88. The derived database products of Crane are also “calibration databases” as recited in the Preamble.

89. Crane states that “[t]he derived database products may include only portions of all the data in the master version of the database” and serve to “improve accuracy” of the geographic database—just as the “calibration database” in Claim 1 serves to enhance the accuracy of the collected data. *Id.*, 6:62-65; EX1001, 1:66-2:4.

90. Thus, Crane discloses the Preamble of claim 1.

1. Element [1.1] is Disclosed in Crane and Spain

91. Element [1.1] recites “receiving at a wireless device an attribute of a signal transmitted by a wireless transmitter to a mobile station in a region.” Crane and Spain disclose Element [1.1].

92. It is my understanding that “mobile station” refers to a wireless communication device that receives a signal transmitted by a wireless transmitter. It is my understanding that “wireless device” refers to a device capable of transmitting and receiving signals while unattached to any physical wires.

93. Crane discloses the use of cellular phones, which fall under the definitions of “mobile station” and “wireless device.” EX1004, 1:13-20.

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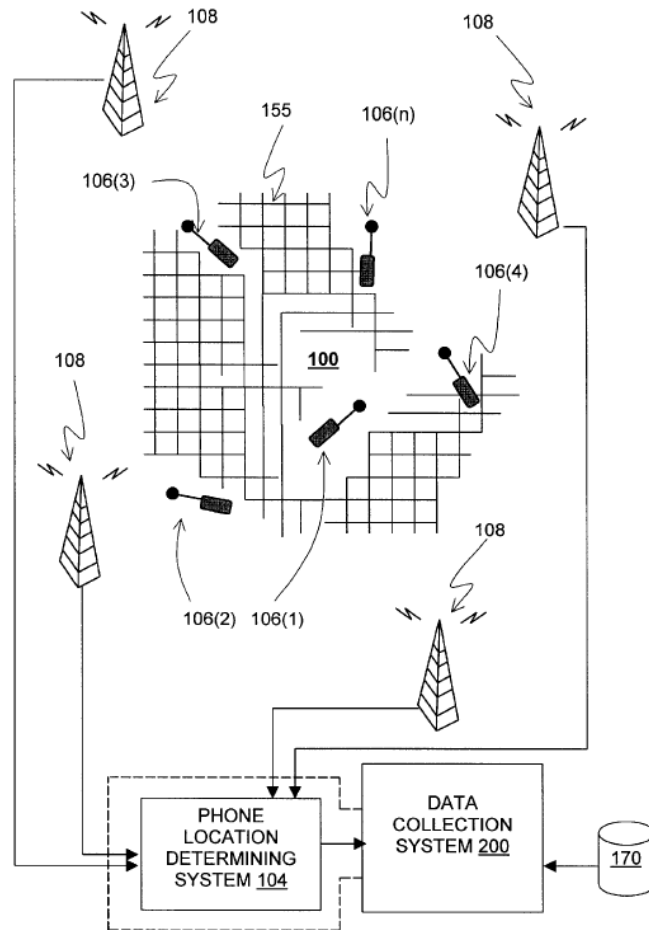
94. For example, Crane discloses using cellular phones “or other types of wireless phones” to collect geographic data and match the positions of phones to positions of roads in a geographic area. EX1004, 1:13-20.

95. Crane recognizes that the cellular phones include wireless components (*e.g.*, while unattached to any physical wires) to both receive and transmit wireless signals. *Id.*; *see also id.* at 7:33-50 (disclosing wireless phones having hardware and software that determine the geographic location of the phone and sending that information to the data collection system).

96. Thus, Crane discloses mobile stations and wireless devices that receive and transmit wireless signals.

97. Crane also discloses a region as geographic area 100, including “mobile stations”/“wireless devices” and including base stations/towers. EX1004, Fig. 1 (illustrating geographic area 100 with cellular phones depicted as 106(1), 106(2), 106(3), 106(4), and 106(n)), and towers depicted as 108), 2:36-39, 2:66-3:7.

FIG. 1

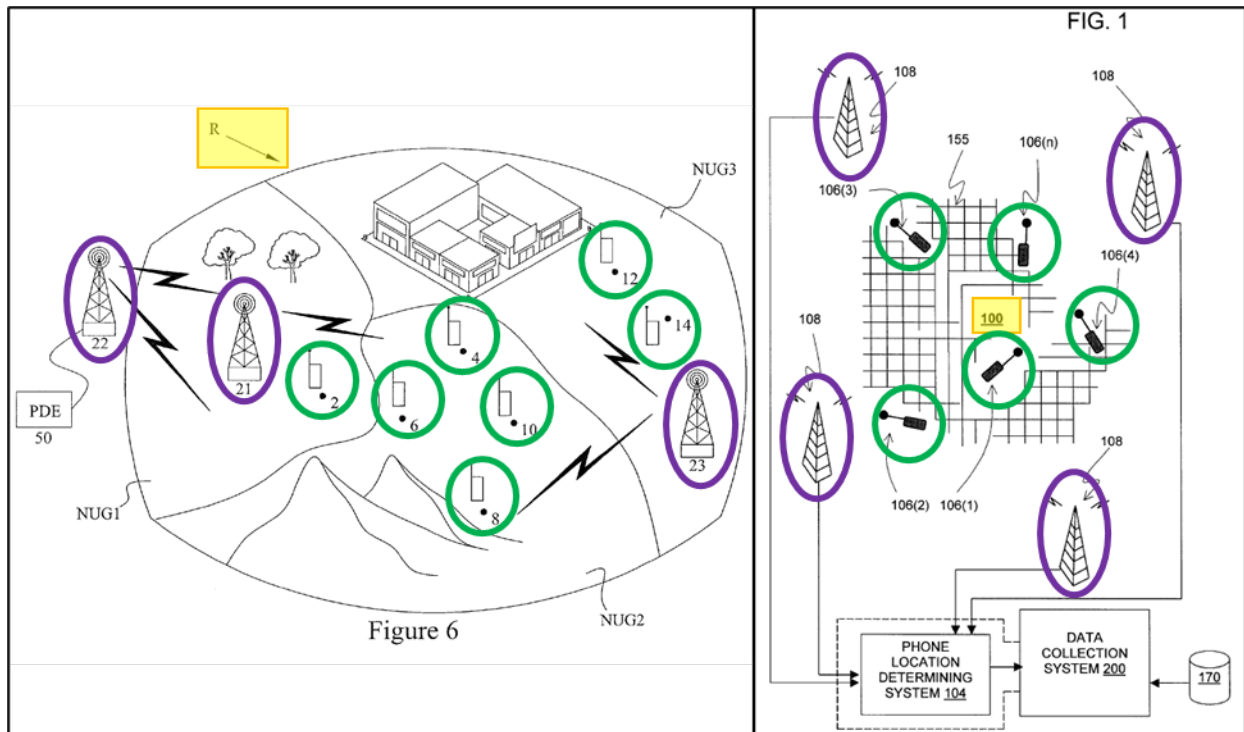


98. The “towers 180 or other equipment located throughout the geographic area 100” making up the cellular phone location determining system 104 is a system component having a “wireless transmitter.” EX1004, Fig. 1 and 3:1-7.

99. The towers are shown in Fig. 1 to wirelessly provide inputs (*i.e.*, signals with signal strengths) to the cellular phone’s phone location determining system 104. The claimed elements and Crane’s corresponding disclosures are visualized in a

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side-by-side of the '784 Patent's Fig. 6 and Crane's Fig. 1 (reproduced and annotated below):



100. “Mobile stations” and/or “wireless devices” that receive and transmit signals are circled in green. “Wireless transmitters” that send to and receive signals from the “mobile stations” are circled in purple. These “mobile stations” and “wireless transmitters” are located within a region (highlighted “R” in Fig. 6 of the '784 Patent and “100” in Fig. 1 of Crane).

101. Crane does not expressly disclose the specific manner by which a cellular phone's location is determined by “phone location determining system 104”. Although Fig. 1 of Crane clearly depicts the towers 108 providing signals to the

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phone location determining system 104, Crane does not expressly state that its cellular phones receive “an attribute of a signal” from a wireless transmitter.

102. It is my understanding that “an attribute of a signal” refers to information of a signal transmitted by a wireless transmitter. Crane therefore does not expressly disclose that its cellular phones receive information of a signal transmitted by a wireless transmitter.

103. Because Crane’s cellular phones and systems are described as using “911” cellular phone location technologies and as using “any such technology that is presently available or that becomes available in the future ... suitable for the phone location determining system 104 in FIG. 1”, Crane contemplates a POSITA referencing other documents for such technologies. EX1004, 3:7-13.

104. Spain expressly discloses such technologies and therefore satisfies the missing limitation of locating a wireless device, such as a cellular phone, using attributes of a signal transmitted by a wireless transmitter to the device.

105. Spain, like Crane, discloses a “mobile station” and a “wireless device”: “Mobile Unit (mobile unit) in a wireless communication network.” EX1005, ¶[0030]:2-3; *see also id.* at ¶[0032]:3-4 (“the mobile unit could be equipped with a GPS receiver” allowing the mobile unit to determine its own location).

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106. As with Crane, Spain discloses that its “mobile station”/“wireless device” wirelessly communicates with a “transmitter”: “communication link between the mobile unit and location server is through the base stations and base station controllers of the cellular network.” EX1005, ¶[0037]:7-10; *see also id.* at ¶[0031]:2-4, Fig. 1.

107. Here, the “base station” of Spain is the claimed “transmitter.”

108. Spain expressly states that in its mobile device location determination system, a “mobile station”/“wireless device” receives an “attribute of a signal” from the “transmitter”: “The mobile unit is equipped with the appropriate circuitry and software to capture the required signals and their parameters.” EX1005, ¶[0043]:1-4; *see also id.* at ¶[0037]:10-11 (“data is communicated in both directions”).

109. Here, the “signals and their parameters” of Spain are the claimed “attribute of a signal,” *i.e.*, information of a signal transmitted by a wireless transmitter as construed per Paragraph 84.

110. Spain discloses that one of those “signals and their parameters” may be a signal strength, broadcast control channel number, or a base station identity code: “In one embodiment, signal strength is used.... In yet another embodiment, the identity of the signal source (*e.g.*, channel number or station code) is used.” EX1005,

¶[0041]; *see also id.* at ¶[0043]:11-13 (“the location of the transmitter is broadcast in the signal and is extracted in the mobile unit”).

111. The use of Spain’s attribute of a signal transmitted by a wireless transmitter to a wireless device for determining the location of the wireless device by the phone location determining system 104 of Crane would have been implemented in a routine manner with a high probability of success to yield a predictable result and would have been obvious to a POSITA.

112. Thus, Spain discloses an exemplary phone location determination system contemplated by Crane, such that Crane and Spain in combination disclose each and every limitation of Element [1.1].

2. Element [1.2] is Disclosed in Crane and Spain

113. Element [1.2] recites “wirelessly transmitting from said wireless device said attribute to a controller unit.” Crane and Spain in combination disclose Element [1.2].

114. It is my understanding that a “controller unit” refers to a component capable of monitoring data and entering data into a database. Crane discloses a controller unit that is capable of monitoring data and entering data into a database. I have also been informed and it is my understanding that a “controller unit” may encompass a device capable of controlling another device and/or process. The “data

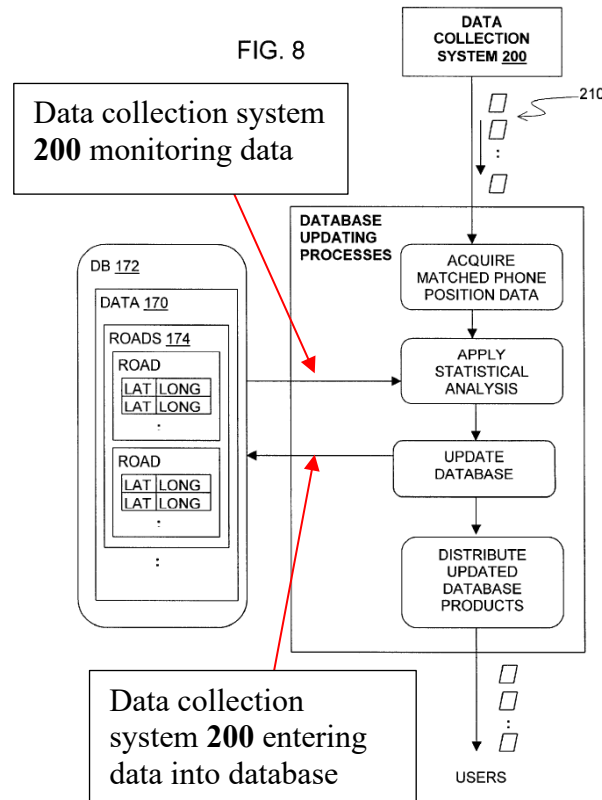
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collection system 200” of Crane is the claimed “controller unit.” Crane’s data collection system 200 monitors data. EX1004, 3:49-51 (“data collection system 200 uses the data 140 collected by the cellular phone location determining system 104”), 3:57-59 (“data collection system 200 includes a process 250 that acquires the data 140 indicating the positions of cellular phones in a geographic area”). Crane’s data collection system 200 also enters data into a database, *e.g.*, updating database products. EX1004, 3:52-56, 6:46-61, Figs. 4/7/8.

115. For example, “data collection system 200 uses the data 140 collected by the cellular phone location determining system 104 in conjunction with the data 170 from the geographic database 172 to generate new data 210. The data collection system 200 matches the acquired cellular phone position data 140 to the locations of roads 152 represented by the data 170 in the geographic database 172.” EX1004, 3:49-55.

116. Additionally, “positions of cellular phones traveling through the geographic area can also be used to update the data that indicate the positions of roads that are already represented in the geographic database.” EX1004, 6:46-49. *See also* Fig. 8.

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117. Crane discloses that its “wireless devices” wirelessly communicate with the “controller” through the cellular phone location determining system 104. EX1004, 3:4-7.

118. Crane does not expressly disclose that its cellular phones transmit an “attribute of a signal” to data collection system 200. Spain expressly discloses this missing limitation as discussed in Section XIII.A.1.

119. Like Crane, Spain discloses that its mobile unit wirelessly communicates with a controller: “communication link between the mobile unit and

location server is through the base stations and base station controllers of the cellular network.” EX1005, ¶[0037]:7-10; *see also id.* at ¶[0031]:2-4, ¶[0037]:1-5, Fig. 1.

120. Spain discloses that its mobile unit transmits the “attribute of a signal” to the controller. EX1005, ¶[0043]:1-3 (“The mobile unit ... capture[s] the required signals and their parameters.”), ¶[0037]:10-11 (“data is communicated in both directions”, *i.e.*, from the base station to the mobile unit and from the mobile unit to the base station and base station controllers).

121. The use of Spain’s attribute of a signal transmitted by a wireless transmitter to a wireless device for determining the location of the wireless device by the phone location determining system of Crane would have been implemented in a routine manner with a high probability of success to yield a predictable result.

122. Thus, Crane and Spain in combination disclose each and every limitation of Element [1.2].

3. Element [1.3] is Disclosed in Crane

123. Element [1.3] recites “obtaining location data of a plurality of geographic locations situated within said region, wherein said location data is determined using said wireless device, and wherein said region contains plural streets and intersections of said plural streets.” Crane discloses Element [1.3].

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124. Crane discloses obtaining location data using Crane's "phone location determining system 104" for generating the updated geographic database with "new, more accurate data" (*i.e.*, a calibration database) in the same manner as is described with respect to Fig. 9 of the '784 Patent [EX1001, 8:55-60]. *See* EX1004, 3:49-52; 6:56-58.

125. For example, "the cellular phone location determining system 104 outputs data 140 identifying the phone, the position (*e.g.*, geographic coordinates, relative coordinates, etc.), and a time stamp (*e.g.*, the absolute or relative time at which the identified cellular phone was at the identified position)." EX1004, 3:27-31.

126. Thus, Crane obtains the location data (*e.g.*, the position of a cellular phone) using the wireless devices, or cellular phones, of Crane.

127. Crane also discloses using such wireless device location data for providing a wireless device "status" (*e.g.*, information regarding the movement or orientation of the wireless device). *See* EX1004, 4:27-34.

128. It is my understanding that a "location data of a plurality of geographic locations" refers to a set of location data for geographic locations in a geographic region obtained by a wireless device. *See* EX1001, 8:28-41, 8:43-54.

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129. For example, the '784 Patent discusses “obtaining location data for a plurality of geographic locations situated within a region from the wireless device and providing a location information database including latitude and longitude information for each of a plurality of points within the region.” EX1001, 2:25-29. The '784 Patent discloses that “location data may be obtained for a geographical region (operation 701). The first set of location data may be stored in a database (operation 702).” EX1001, 8:29-31.

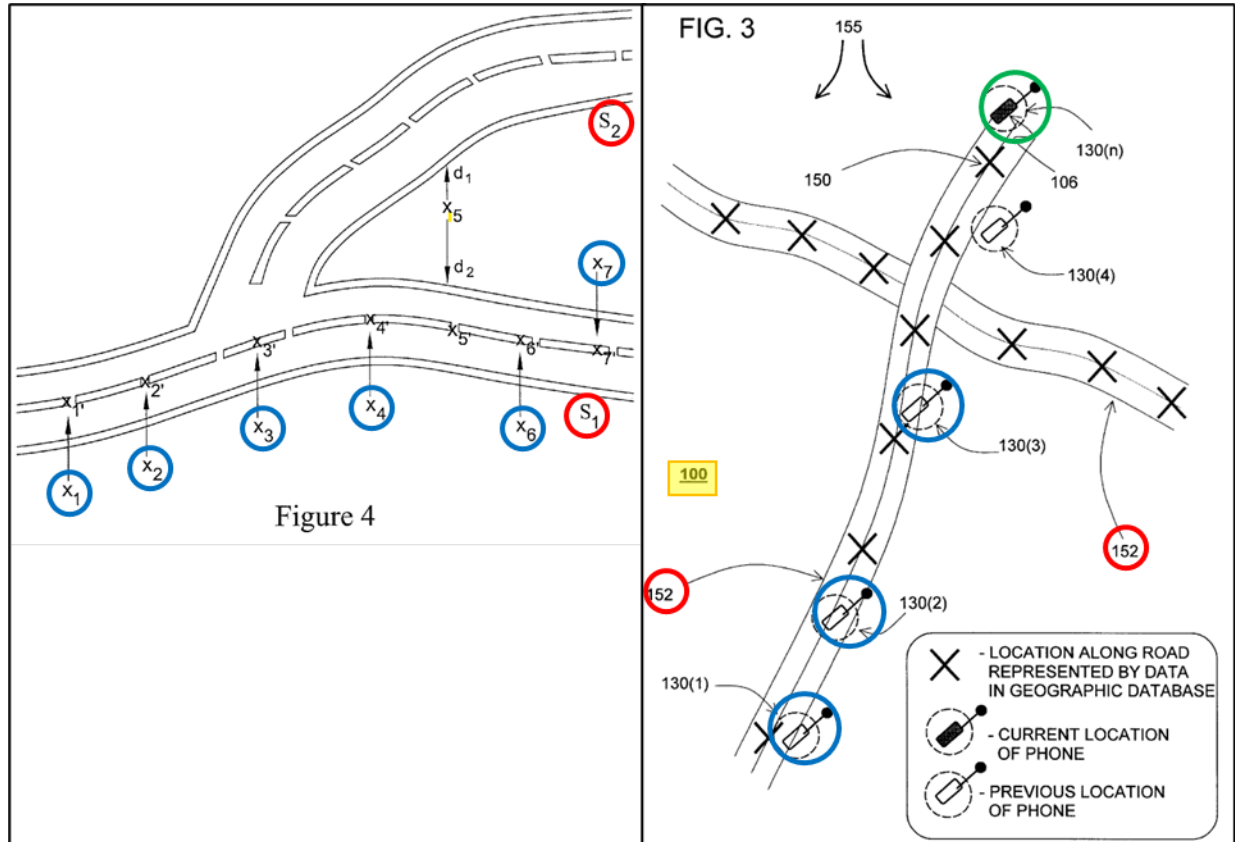
130. Crane discloses obtaining a set of location data (*e.g.*, 140) for geographic locations (*e.g.*, 130(1), 130(2), ... 130(n)) situated within a region (*e.g.*, geographic region 100). EX1004, 3:16-32, Fig. 2.

131. Crane discloses that the location data is determined using the cellular phone “wireless device.” EX1004, 1:13-20, 3:4-13.

132. Crane also discloses that the “region contains plural streets and intersections of said plural streets.” EX1004, Fig. 3 (depicting at least two streets of road network 155 that intersect in region 100), 3:33-48.

133. The claimed elements and Crane’s corresponding disclosures are visualized in a side-by-side of the '784 Patent’s Fig. 4 and Crane’s Fig. 3 (reproduced and annotated below):

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134. “Mobile stations”/“wireless devices” that receive and transmit signals are circled in green (“106” in Fig. 3 of Crane). The “plurality of geographic locations” are circled in blue. These “mobile stations”/“wireless devices” and the “plurality of geographic locations” are located within a region (highlighted as “100” in Fig. 3 of Crane). Both figures illustrate a “region contain[ing] plural streets and intersections of said plural streets” (each street label is circled in red, “S1” and “S2” in Fig. 4 of the ’784 Patent and “152” in Fig. 3 of Crane).

135. Thus, Crane discloses each and every limitation of Element [1.3].

4. Element [1.4] is Disclosed in Crane

136. Element [1.4] recites “providing a location information database wherein said location database includes latitude and longitude information for each of a plurality of points within said region.” Crane discloses Element [1.4].

137. It is my understanding that a “location information database” means a database of latitude and longitude information for plural points in a geographic region. *See* EX1001, 2:14-16.

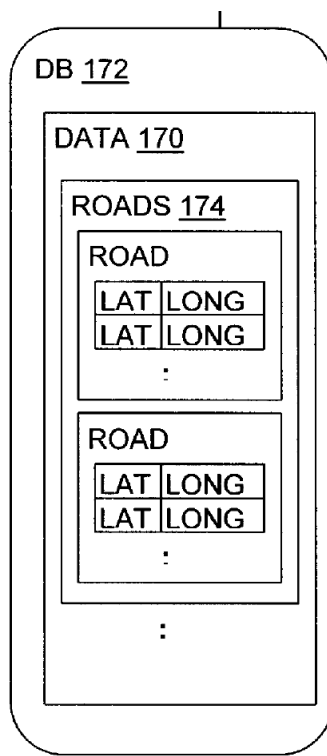
138. For example, “[a] location information database having accurate latitude and longitude information for plural points in the same geographic region may be provided, such as a street database.” EX1001, 8:60-63. During Examination of a ’784 parent application, it is my understanding that Owner stated “[t]he location information database includes geographic points associated with, for example, roads or other geographic features. These points are distinct from the geographic locations described above and obtained by the wireless device.” EX1007, p.11.

139. Crane discloses providing a location information database (*e.g.*, geographic database 172) containing latitude and longitude information for plural points (*e.g.*, “data 174 representing the coordinates of the points along the roads 152 that form the road network 155 represented by the geographic database 172”) in a

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geographic region (*e.g.*, 100). EX1004, Figs. 3/4 (depicting database 172 comprising road data 174 with the specific latitude and longitude information), 3:45-48.

140. The data 174 of Crane representing the coordinates of points along roads 152 is specifically shown as latitude and longitude information in, for example, Fig. 4 of Crane. *See* EX1004, Fig. 4.



141. Thus, Crane discloses each and every limitation of Element [1.4].

5. Element [1.5] is Disclosed in Crane

142. Element [1.5] recites “determining a status of said wireless device.” Crane discloses Element [1.5].

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143. It is my understanding that a “status of said wireless device” refers to information regarding the movement or orientation of the wireless device. Examples of such a status include the direction of travel, speed of travel, and a change in direction of travel, according to the ’784 Patent. EX1001, Claim 11.

144. Crane discloses the status of its cellular phones:

As mentioned above, the cellular phone location determining system 104 can acquire a plurality of locations of a single phone over a period of time. Each position of the cellular phone relative to the previous (in time) position, a ***rate of travel*** of the cellular phone across a geographic area can be determined. ***A direction of travel*** can also be determined.

EX1004, 4:27-34 (emphasis added).

145. It is my understanding that Petitioner and Owner, in Related Litigation, stipulate that “status of said wireless device” should be construed as “information regarding the movement or orientation of the wireless device.” EX1023, p.1. Crane discloses “information regarding the movement or orientation of the wireless device” because Crane discloses determining positions of cellular phones relative to previous positions in time, a rate of travel of the cellular phone, and a direction of travel of a cellular phone. EX1004, 4:27-34.

146. Thus, Crane discloses each and every limitation of Element [1.5].

6. Element [1.6] is Disclosed in Crane

147. Element [1.6] recites “determining from said status a most likely one of said plural streets upon which said wireless device is located.” Crane discloses Element [1.6].

148. It is my understanding that “a most likely one of said plural streets upon which said wireless device is located” refers to a street on which a wireless device is most likely located.

149. For example, “based upon the status, a most likely street upon which the wireless device is sited may be determined as the geographic location (907).” EX1001, 8:64-66. It is my understanding that Owner’s Preliminary Infringement Contentions characterize this term as “whether a device is located on a street and what street the device is likely located on.” EX1011, p.8, 1[g]. Owner states that a device’s “direction and speed of travel, including in conjunction with other information and data” may be used “to determine whether the device is located on a street and what street the device is likely located on.” *Id.*

150. Crane determines from the status (*e.g.*, direction of travel, rate of travel), the most likely street upon which the cellular phone is located:

[T]he data collection system 200 includes a process 256
that matches the acquired cellular phone positions 140 to

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positions of roads 152 which are represented by the data 170 in the geographic database 172....

The matching process 256 optionally includes other processes 260 that perform analysis and filtration of the data 140. The analysis and filtration processes 260 may make use of several assumptions and/or observations.... For example, if the acquired cellular position data 140 ***indicate that the cellular phone is on or within a certain threshold distance of the position of a road 152 or is moving, the cellular phone can be assumed to be inside of a vehicle traveling along the road [152]....*** The analysis process 260 computes a distance 270 between each of the locations 130 of the phone and the straight dashed lines 266 which represent the roads. ***If the distances 270 are sufficiently small, the cellular phone can be assumed to be in a vehicle traveling along the actual [i.e., most likely] road.***

Another operation that can be performed in the analysis and filtration step 260 is to ***determine a rate of travel of the cellular phone.*** The rate of travel can be used as a factor when determining whether the cellular phone is located in a vehicle travelling along the road.

EX1004, 3:57-47 (emphasis added).

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151. Here, Crane uses the status of the cellular phone (*i.e.*, direction of travel in relation to its distance from known roads, whether it is moving, and/or the rate of travel), to determine the most likely street (*e.g.*, 152) that the vehicle carrying the cellular phone is travelling along.

152. Thus, Crane discloses each and every limitation of Element [1.6].

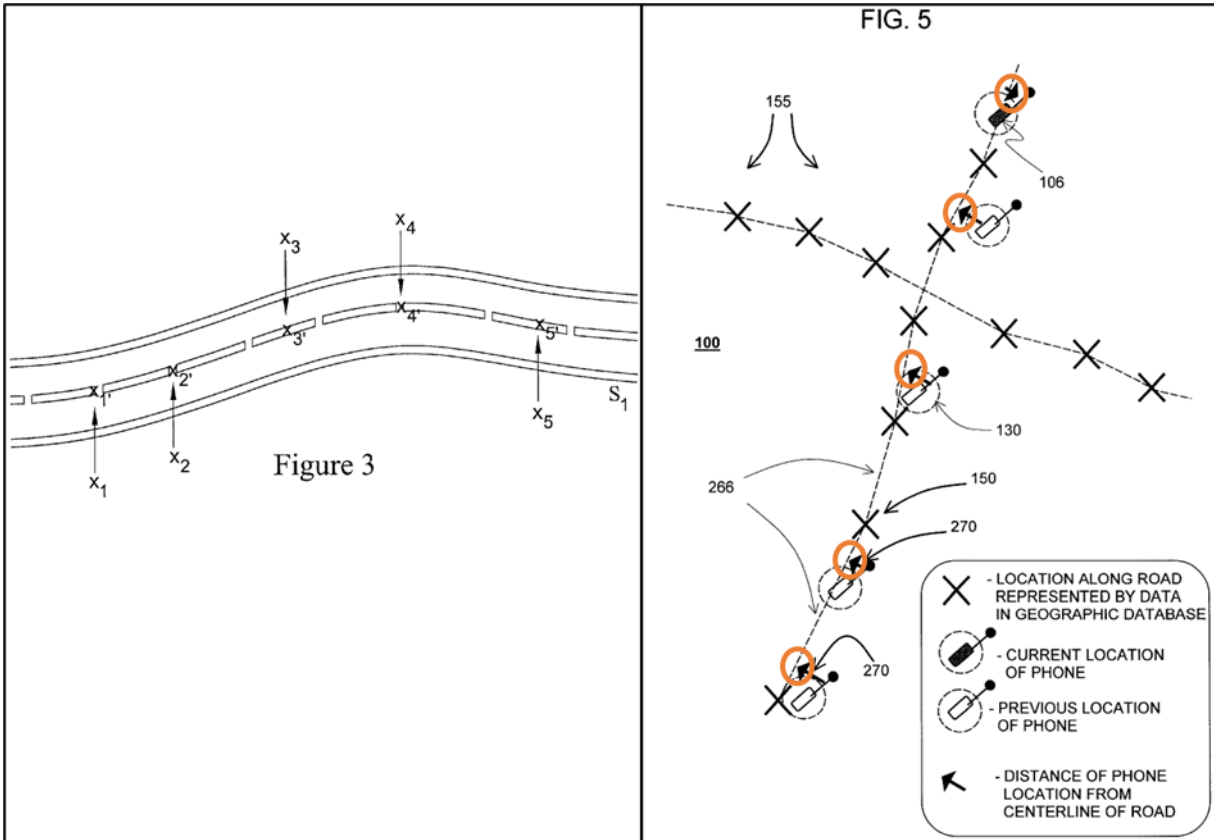
7. Element [1.7] is Disclosed in Crane

153. Element [1.7] recites “determining said most likely street as a first one of said plural geographic locations.” Crane discloses Element [1.7].

154. It is my understanding that “determining said most likely street as a first one of said plural geographic locations” at least encompasses determining a street on which a wireless device is most likely located as a first geographic location of a geographic region. This is consistent with the claim language of the ’784 Patent, however, the bounds of the terms of Element [1.7] are unclear.

155. Crane discloses at least determining a street on which a wireless device is most likely located as a first geographic location of a geographic region. Again, the claimed elements and Crane’s corresponding disclosures are visualized in a side-by-side of the ’784 Patent’s Fig. 3 and Crane’s Fig. 5 (reproduced and annotated below):

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156. In the '784 Patent, location data points X_1, X_2, X_3, X_4 , and X_5 are measured by a mobile station/wireless device. EX1001, 4:19-20, Fig. 3.

157. Once the location data points are obtained, a location information database uses the measured location data points (X_1 - X_5) to determine points located on the most likely street $X_1', X_2', X_3', X_4',$ and X_5' . EX1001, 4:21-25, Fig. 3.

158. Here, the most likely street is S_1 .

159. Based on the specification and claim language, I understand that the location data points (*e.g.*, X_1 - X_5) measured by a mobile station/wireless device may be used to determine street S_1 as a street on which a wireless device is most likely

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located. Thus, per Paragraph 126, “determining said most likely street as a first one of said plural geographic locations” may at least encompass determining a street on which a wireless device is most likely located as a first geographic location of a geographic region. However, the bounds of the term are unclear.

160. Crane at least discloses determining a street on which a wireless device is most likely located as a first geographic location of a geographic region by disclosing an example matching Fig. 3 of the '784 Patent. EX1004, Example II.

161. Crane discloses location data points 140 (*see e.g.*, Figs. 2/4 of Crane) measured by a mobile station 106 (*see e.g.*, 130(1), 130(2), 130(4), and 130(n) in Fig. 3 of Crane). Once the location data points are obtained, a location information database (*e.g.*, geographic database 172) is used to determine the points located on a street on which a wireless device is most likely located as plural geographic locations (*e.g.*, orange circles in annotated Crane Fig. 5). EX1004, 3:15-56, Fig. 5.

162. By following this process, Crane determines a first mostly likely street location of the geographic locations, a second most likely street location of the geographic locations and so forth.

163. Thus, Crane discloses each and every limitation of Element [1.7].

8. Element [1.8] is Disclosed in Crane

164. Element [1.8] recites “determining a first point of said plural points that is in proximity to said first geographic location.” Crane discloses Element [1.8].

165. It is my understanding that “determining a first point of said plural points that is in proximity to said first geographic location” refers to determining a point from the location information database that is in proximity to the first geographic location. It is my understanding that “in proximity” is indefinite as the bounds of the term are unclear. However, I recognize that “in proximity” at least encompasses where the “first point” and “said first geographic location” match (*e.g.*, the first point and said geographic location are the exact same location). Crane discloses determining a first point of the plural points that is “in proximity” to the first geographic location.

166. Crane describes a matching process where the “data collection system 200 matches the acquired cellular phone positions 140 to positions of roads 152 which are represented by the data 170 in the geographic database 172. Various techniques for map matching can be used. For example, map matching techniques are used in navigation systems to match geographic coordinates obtained by GPS systems to geographic data contained in geographic databases that define road positions.” EX1004, 3:59-67.

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167. Crane discloses an example of a matching process 256 where, “the acquired cellular position data 140 indicate that the cellular phone is ***on or within a certain threshold distance of the position of a road 152.***” EX1004, 4:5-7 (emphasis added).

168. Crane then discloses providing “straight dashed lines 266 that connect the points 150 that are located along the actual roads (152 shown in FIG. 3) and for which data (174 in FIG. 4) are included in the geographic database to represent the positions of the roads.” EX1004, 4:10-12.

169. “The straight dashed lines 266 in FIG. 5 approximate the actual paths of the roads represented by the points 150.” EX1004, 4:13-14.

170. Per Section XIII.A.7., Crane makes use of the matching process 256 and the dashed lines 266 to determine at least a first point of said plural points that exactly matches or is on a first geographic location.

171. In addition to using a location information database (*e.g.*, geographic database 172) to determine the points located on the most likely street as plural geographic locations, Crane determines corresponding plural points that are “in proximity” to the respective plural geographic locations by a plural point and a geographic location having a matching location determined by the matching process 256. *See* EX1004, 4:1-20.

175. “Each of the points 150 is associated with geographic coordinates that define the location of the point in the geographic area 100.” EX1004, 3:40-42, Fig. 3.

176. That is, each X circled in red in the right-hand panel is one of a “plurality of points within said region.” The plural geographic locations (orange circles) are illustrated as being “on or within a certain threshold distance of the position of a road 152” and thus are “on or within a certain threshold distance” of a plural geographic location. EX1004, 4:7-8. Crane determines a plural point (red circles) that at least matches a geographic location.

177. Thus, Crane discloses determining the plural points that are “in proximity” to the geographic locations because it is recognized that “in proximity” at least encompasses where the “first point” and “said first geographic location” match (*e.g.*, the first point and said geographic location are the exact same location). EX1004, 4:1-3, 4:61-63, Fig. 4. However, the outer bounds of the term “in proximity” are unclear.

178. Thus, Crane discloses each and every limitation of Element [1.8].

9. Element [1.9] is Disclosed in Crane

179. Element [1.9] recites “entering said first point in said calibration database and associating the location data for the first one of said plural geographic

locations determined by said wireless device with the first point.” Crane discloses Element [1.9].

180. It is my understanding that “calibration” encompasses “associating location data for a most likely street upon which a wireless device is located with latitude and longitude information from a location information database.”

181. Crane discloses entering the first point (*e.g.*, corresponding to a wireless device location) into the geographic database to create a new, more accurate database (*i.e.*, a calibration database), from which additional database products can be derived.

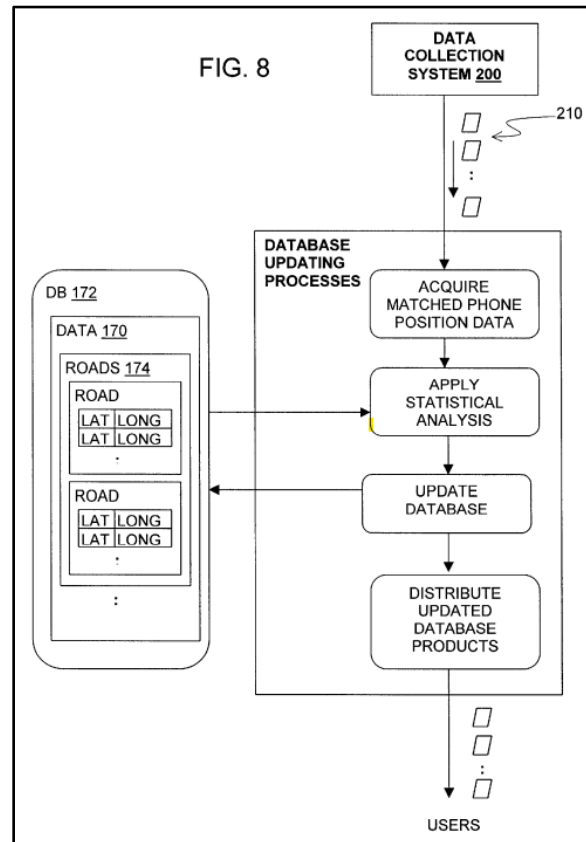
182. For example, Fig. 4 of Crane illustrates entering the first point from the geographic database 172 into the data collection system 200 to generate new data. EX1004, Fig. 4, 3:49 (“In FIG. 4, a data collection system 200 uses the data 140 collected by the cellular phone location determining system 104 in conjunction with the data 170 from the geographic database 172 to generate new data 201.”).

183. In Fig. 8, the output of the data collection system 200 is supplied to database updating processes which update the geographic database 172 with new, more accurate data (*i.e.*, thereby creating a calibration database). The calibration database that is generated and curated by data collection system 200 makes use of new data 201 and can be used to make “derived database products [that] may include

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only portions of all the data in the master version of the [geographic] database.”

EX1004, 4:66-5:3, 5:52-53, 6:62-65.



184. It is my understanding that “associating the location data for the first one of said plural geographic locations determined by said wireless device with the first point” refers to associating, in the calibration database, the location data for a geographic location with a first point (*e.g.*, a wireless device location) that is determined to be proximate to the location data.

185. For example, Fig. 8 illustrates generating a calibration database wherein “[f]rom the plural points in the location information database a first and

second point may be determined that are proximate to a location in the location data (805). Using interpolation between the first and second points a third point may be determined (807). The third point may be entered into a calibration database as the location associated with the location data for the geographic location (809).” EX1001, 8:48-54. Thus, an interpolated point is entered as a new point into the calibration database.

186. Fig. 9 illustrates generating a calibration database using a wireless device, wherein location data is obtained using a wireless device. “The status of the wireless device may be determined (905), and based upon the status, a most likely street upon which the wireless device is sited may be determined as the geographic location (907). A first point from the location information database may be determined that is in proximity to the first geographic location (909) and the first point may then be entered in the calibration database (911).” EX1001, 8:63-9:2. Thus, a first point representing a location of a wireless device is entered as a new point into the calibration database.

187. “Associating” also encompasses “matching,” “comparing,” and/or “modifying” in a database. For example, “[a] street database may be used as a supplemental data source to compare and/or check the integrity of collected location data.” EX1001, 3:42-44. “Checking the integrity of each retrieved ground truth

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location point may include matching each point to the closest street in the street database.” EX1001, 4:7-9. Additionally, “the location data points originally retrieved from a calibration data collection device may be replaced and/or modified with the data derived from the street database.” EX1001, 4:52-55.

188. Crane discloses associating the location data for the first one of the plural geographic locations determined by the wireless device (*e.g.*, location data of a most likely street upon which the wireless device is located) with the first point (*e.g.*, the wireless device location):

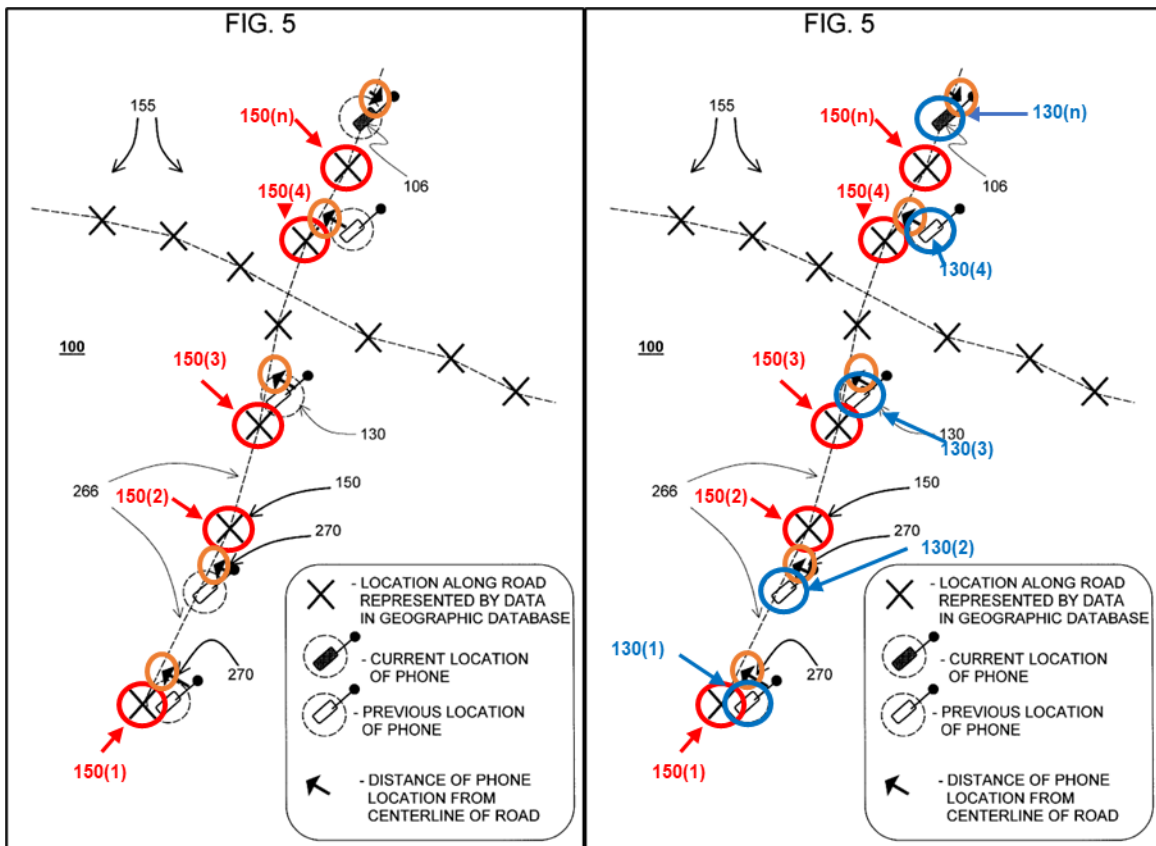
Referring to FIG. 4, the data collection system 200 includes a process 250 that acquires the data 140 indicating the positions of cellular phones in a geographic area [“location data”]. Then the data collection system 200 includes a process 256 that *matches* the acquired cellular phone positions 140 to positions of roads 152 [“plural points”] which are represented by the data 170 in the geographic database 172.

EX1004, 3:57-63 (emphasis added).

189. Each of Crane’s multiple measured location data points (*e.g.*, 130(1), 130(2), 130(n)) are associated/matched to points located on the most likely street (*e.g.*, 150) that are stored in the street database (*e.g.*, 172). EX1004, 3:15-56.

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190. To visualize Crane’s map matching process, annotated versions of Crane Fig. 5 are provided below, wherein cellular phone positions 130(1), 130(2), 130(4), and 130(n) (“location data”) are taken from Fig. 3 and superimposed onto Fig. 5 (see blue text, arrows and circles):



191. The left-hand panel shows the determination of (i) points located on the most likely street as plural geographic locations (orange circles) and (ii) plurality of points located along the road (red circles, text, and arrows) that were determined to be “in proximity” to the plural geographic locations. See Paragraph 137.

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192. The right-hand panel shows each of the cellular phone locations (130(1), 130(2), 130(3), 130(4), and 130(n)) (*i.e.*, location data for the plural geographic locations in blue circles) that is matched with respective positions in red circles (150(1), 150(2), 150(3), 150(4), and 150(n)) for which data are included in the geographic database to represent the positions of the roads (*i.e.*, plurality of points). EX1004, 4:9-14.

193. The combined data in the geographic database constitutes a new, more accurate database wherein mobile device location data is associated with road location data.

194. Further, a POSITA would have understood from the '784 Patent that the location data for the plural geographic locations and the respective positions of such location data in the geographic database as taught by Crane and Spain could all be stored in the same database. EX1001, 3:48-50 (“[t]he street database data may be stored in the same database [] used to store the collected ground truth data.”).

195. Thus, Crane discloses each and every limitation of Element [1.9].

B. Claim 2 is Disclosed in Crane and Spain

196. Claim 2 recites “[t]he method of claim 1 wherein said attribute is selected from the group consisting of: signal strength, Cell global identity, broadcast

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control channel, base station identity code.” Crane and Spain disclose the subject matter of Claim 2. *See* Claim 1, Section XIII.A.1.

197. Per Section XIII.A.1, Spain discloses that one of its “signals and their parameters” may be a signal strength, broadcast control channel number, or a base station identity code: “In one embodiment, signal strength is used.... In yet another embodiment, the identity of the signal source (*e.g.*, channel number or station code) is used.” EX1005, ¶[0041]:3-8.

198. Thus, Crane and Spain in combination disclose each and every limitation of Claim 2.

C. Claim 10 is Disclosed in Crane and Spain

199. Claim 10 recites “[t]he method of claim 1 wherein said location database is a street database.” Crane and Spain disclose the subject matter of Claim 10. *See* Claim 1, Section XIII.A.1.

200. Crane discloses providing a “road network 155 [] represented by data 170 in a geographic database 172 [*i.e.*, location database].” EX1004, 3:37-38.

201. “Included among the data 170 are data 174 representing the coordinates of the points along the roads 152 that form the road network 155 represented the geographic database 172.” EX1004, 45-47.

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202. Thus, Crane expressly discloses that the location database is a street database.

203. Accordingly, Crane and Spain in combination disclose each and every limitation of Claim 10.

D. Claim 11 is Disclosed in Crane and Spain

204. Claim 11 recites “[t]he method of claim 1 wherein said status includes attributes selected from the group consisting of: direction of travel; speed of travel, and change in direction of travel.” Crane and Spain disclose the subject matter of Claim 11. *See* Claim 1, Section XIII.A.1.

205. Per Section XIII.A.5, Crane discloses a status of the cellular phone (*e.g.*, rate of travel and direction of travel). EX1004, 4:27-34.

206. Accordingly, Crane and Spain in combination disclose each and every limitation of Claim 11.

E. Preamble of Claim 12 is Disclosed in Crane

207. The Preamble of Claim 12 recites “[a] system for generating a calibration database, comprising.”⁴

208. Crane discloses a system for generating the calibration database. EX1004, Abstract; *see also id.*, 2:39-33, 6:62-65. *See* Section XIII.A.

⁴ It is my understanding that Petitioner does not concede that the Preamble is limiting.

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209. For example, Crane discloses a “data collection system . . . for updating or refining a geographic database.” Abstract, ll. 1-6.

210. Thus, Crane discloses the Preamble of Claim 12.

1. Element [12.1] is Disclosed in Crane and Spain

211. Element [12.1] recites “a wireless device for determining location data at a plurality of geographic locations situated within a region, wherein said region contains plural streets and intersections of said plural streets, said wireless device receiving an attribute of a signal transmitted by a wireless transmitter to a mobile station in said region.” Crane and Spain disclose Element [12.1].

212. It is my understanding that “wireless device” refers to a device capable of transmitting and receiving signals while unattached to any physical wires. *See* Section XIII.A.1. Crane discloses the use of cellular phones, which fall under the definition of “wireless device.” EX1004, 1:13-20.

213. Crane recognizes that the cellular phones include wireless components (*e.g.*, while unattached to any physical wires) to both receive and transmit wireless signals for determining location data at a plurality of geographic locations situated within a region having plural streets. *See* Section XIII.A.1.

214. Thus, Crane and Spain disclose each and every limitation of Element [12.1].

2. Element [12.2] is disclosed in Crane and Spain

215. Element [12.2] recites “a wireless device transmitter for transmitting from said wireless device said attribute to a controller unit.” Crane and Spain in combination disclose Element [12.2].

216. It is my understanding that a “controller unit” is a component capable of monitoring data and entering data into a database. Crane discloses a component capable of monitoring data and entering data into a database. A “controller unit” may encompass a component that is configured to control one or more other devices. The “data collection system 200” of Crane is the claimed “controller unit.” Crane’s data collection system 200 monitors data. EX1004, 3:49-51 (“data collection system 200 uses the data 140 collected by the cellular phone location determining system 104”), 3:57-59 (“data collection system 200 includes a process 250 that acquires the data 140 indicating the positions of cellular phones in a geographic area”). Crane’s data collection system 200 also enters data into a database, *e.g.*, updating database products. EX1004, 3:52-56, 6:46-61, Figs. 4/7/8.

217. Per Sections XIII.A.1 and XIII.A.2, Crane and Spain disclose a wireless device transmitter.

218. Per Section XIII.A.1, Spain discloses that its mobile unit transmits the “attribute of a signal” to the controller.

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219. For example, Spain discloses that a “generated fingerprint (in the mobile unit) is transmitted to the location server over the wireless link.” EX1005, ¶[0048]. The mobile unit (*e.g.*, wireless device) of Spain is depicted having an antenna 102 which is used to transmit and receive signals over a “communication link between the mobile unit and location server [] through the base stations and base station controllers of the cellular network.” EX1005, ¶[0037].

220. Thus, Crane and Spain in combination disclose each and every limitation of [12.2].

3. Element [12.3] is Disclosed in Crane

221. Element [12.3] recites “a location information database wherein said location data base includes latitude and longitude information for each of a plurality of points within said region.” Crane discloses Element [12.3].

222. Per Section XIII.A.3, Crane discloses a location information database (*e.g.*, geographic database 172) to determine the points located on the most likely street as plural geographic locations. The “location information database” means a database of latitude and longitude information for plural points in a geographic region. Crane discloses a location information database (*e.g.*, geographic database 172) containing latitude and longitude information for plural points (*e.g.*, “data 174 representing the coordinates of the points along the roads 152 that form the road

network 155 represented by the geographic database 172”) in a geographic region (e.g., 100). EX1004, Figs. 3/4 (depicting database 172 comprising road data 174 with the specific latitude and longitude information), 3:45-48.

223. Thus, Crane discloses each and every limitation of [12.3].

4. Element [12.4] is Disclosed in Crane

224. Element [12.4] recites “circuitry for determining a status of said wireless device.” Crane discloses Element [12.4].

225. Crane discloses circuitry for determining a status of the wireless device. For example, Crane discloses that “[t]he cellular phone location determining system 104 may include appropriate *hardware* and software that are able to locate the positions of cellular phones 106 in the geographic area.” EX1004, 3:4-7 (emphasis added).

226. Likewise, Fig. 1 of Crane illustrates that the data collection system 200 contains physical components (e.g., circuitry) enabling it to determine a status of the wireless device. EX1004, 2:36-40; *see also* Section XIII.A.5.

227. Thus, Crane discloses each and every limitation of Element [12.4].

5. Element [12.5] is Disclosed in Crane

228. Element [12.5] recites “circuitry for determining from said status a most likely one of said plural streets upon which said wireless device is located.” Crane discloses Element [12.5].

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229. Per Sections XIII.A.6 and XIII.E.4, Crane discloses a circuitry for determining from said status a most likely one of said plural streets upon which said wireless device is located.

230. Thus, Crane discloses each and every limitation of Element [12.5].

6. Element [12.6] is Disclosed in Crane

231. Element [12.6] recites “circuitry for determining said most likely street as a first one of said plural geographic locations.” Crane discloses Element [12.6].

232. Per Sections XIII.A.7 and XIII.E.4, Crane discloses circuitry for determining said most likely street as a first one of said plural geographic locations.

233. Thus, Crane discloses each and every limitation of Element [12.6].

7. Element [12.7] is Disclosed in Crane

234. Element [12.7] recites “circuitry for determining a first point of said plural points that is in proximity to said first geographic location.” Crane discloses Element [12.7].

235. Per Sections XIII.A.8. and XIII.E.4., Crane discloses circuitry for determining a first point of said plural points that is in proximity to said first geographic locations.

236. Per Section XIII.A.8., it is my understanding that “in proximity” is indefinite as the bounds of the term are unclear. However, it is recognized that “in proximity” at least encompasses where the “first point” and “said first geographic

location” match (*e.g.*, the first point and said geographic location are the exact same location).

237. Thus, Crane discloses each and every limitation of Element of [12.7].

8. Element [12.8] is Disclosed in Crane

238. Element [12.8] recites “circuitry for entering said first point in said calibration database; and associating the location data for the first one of said plural geographic locations determined by said wireless device with the first point.” Crane discloses Element [12.8].

239. For example, in Fig. 4 Crane illustrates entering the first point from the geographic database 172 into the data collection system 200 to generate new data. EX1004, Fig. 4, 3:49 (“In FIG. 4, a data collection system 200 uses the data 140 collected by the cellular phone location determining system 104 in conjunction with the data 170 from the geographic database 172 to generate new data 201.”).

240. Per Sections XIII.A.9. and XIII.E.4., Crane discloses circuitry for entering said first point in said calibration database; and associating the location data for the first one of said plural geographic locations determined by said wireless device with the first point.

241. Thus, Crane discloses each and every limitation of Element [12.8].

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242. Accordingly, Crane and Spain in combination disclose each and every element of Claim 12.

F. Claim 13 is Disclosed in Crane and Spain

243. Claim 13 recites “[t]he system of claim 12 wherein said attribute is selected from the group consisting of: signal strength, Cell Global identity, broadcast control channel, base station identity code.” *See* Claim 12. Crane and Spain disclose the subject matter of Claim 13.

244. Per Section XIII.A.1, Spain discloses that one of its “signals and their parameters” may be a signal strength, broadcast control channel number, or a base station identity code: “In one embodiment, signal strength is used.... In yet another embodiment, the identity of the signal source (*e.g.*, channel number or station code) is used.” EX1005, ¶[0041]:3-8.

245. Thus, Crane and Spain in combination disclose each and every element of Claim 13.

G. Claim 21 is Disclosed in Crane and Spain

246. Claim 21 recites “[t]he system of claim 12 wherein said location database is a street database.” Crane and Spain disclose the subject matter of Claim 21. *See* Claim 12, Section XIII.E.

247. Crane discloses providing a “road network 155 [] represented by data 170 in a geographic database 172 [*i.e.*, location database].” EX1004, 3:37-38.

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248. “Included among the data 170 are data 174 representing the coordinates of the points along the roads 152 that form the road network 155 represented the geographic database 172.” EX1004, 45-47.

249. Thus, Crane expressly discloses that the location database is a street database.

250. Accordingly, Crane and Spain in combination disclose each and every element of Claim 21.

H. Claim 22 is Disclosed in Crane and Spain

251. Claim 22 recites “[t]he system of claim 12, wherein said status includes attributes selected from the group consisting of: direction of travel; speed of travel, and change in direction of travel.” Crane and Spain disclose the subject matter of Claim 22. *See* Claim 12, Section XIII.E.

252. Per Section XIII.A.5., Crane discloses a status of the cellular phone (*e.g.*, rate of travel and direction of travel). EX1004, 4:27-34.

253. Accordingly, Crane and Spain in combination disclose each and every element of Claim 22.

I. A POSITA Would Have Been Motivated to Implement Spain’s Signal Attribute Conveyance in Crane’s Methods and Systems

254. A POSITA would have been motivated to modify the methods and systems of Crane to incorporate (i) receiving a signal attribute from a wireless

transmitter and (ii) sending a signal attribute to a controller unit, as taught by Spain. Crane and Spain both seek to improve on conventional methods for geolocation by incorporating supplemental information. EX1004, 2:5-8, 3:11-13 (“Any such technology that is presently available or that becomes available in the future may be suitable for the phone location determining system.”), 7:33-35; EX1005, ¶[0034]:5-7 (“the present invention complements existing location determining technologies and, when used in conjunction with them, augments their performance.”).

**J. A POSITA Would Have Had a Reasonable Expectation of
Successfully Implementing Spain’s Signal Attribute Conveyance
Method in Crane’s Methods and Systems**

255. A POSITA would have had a reasonable expectation of successfully modifying the methods and systems of Crane to incorporate (i) receiving a signal attribute from a wireless transmitter and (ii) sending a signal attribute to a controller unit, as taught by Spain. Neither prior art disclosure, either alone or in combination, requires additional infrastructure to affect a successful outcome. EX1004, 8:14-18 (“the present system and method provide for collecting geographical data using an existing infrastructure that covers all roads.”); EX1005, ¶[0034]:1-4 (“The present invention provides a new method for determining the location of mobile unit 10 which ... does not require any infrastructure modifications.”).

XIV. SECONDARY CONSIDERATIONS

256. As discussed herein, all elements of the Challenged Claims were known in the art, and any differences would have been obvious to a POSITA based on the disclosures of the applied references and the knowledge in the art.

257. I am not aware of any secondary considerations that would alter my opinion. For instance, there was no long felt need as multiple different databases and calibration data used for determining locations of wireless device were known and used before the effective filing date of the '784 Patent.

258. As another example, the '784 Patent and its techniques are not widely used in the art or incorporated into any commercially successful location determination systems. I am not aware of a location determination system that is commercially successful marked with the '784 Patent.

259. Any secondary considerations evidence Owner may offer in this proceeding would be insufficient to overcome the strong evidence that the Challenged Claims are obvious.

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XV. CONCLUSION

260. For the reasons set forth above, it is my opinion that all elements of Claims 1, 2, 10-13, 21, and 22 of the '784 Patent are disclosed or suggested by the prior art. In my opinion, Claims 1, 2, 10-13, 21, and 22 of the '784 Patent would have been obvious over the prior art.

261. In signing this Declaration, I understand that the Declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I acknowledge that I may be subject to cross-examination in the case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

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

Date: __August 7, 2023__



David H. Williams

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APPENDIX 1

I have previously testified and/or been consulted as an expert in the
following matters:

Clients	Filing Date	Court Case Information (if applicable)
BJs Wholesale	April 2023 (Institution Scheduling Order)	BJ'S WHOLESALE CLUB HOLDINGS, INC. v. WALMART APOLLO, LLC; PTAB; IPR2022-01496, Patent 10,368,187 B1; IPR2022-01509, Patent 10,368,188 B2; Deposition
OHD (Overhead Door)	August 2020	ITC, Overhead Door Corporation and GMI Holdings Inc. v. The Chamberlin Group (CGI), In the Matter of CERTAIN MOVABLE BARRIER OPERATOR SYSTEMS AND COMPONENTS THEREOF, Investigation No. 337-TA-1209 – Deposition on Enforcement Proceeding
UTTO	March 25,2022	UTTO INC., Plaintiff, v. METROTECH CORPORATION, Defendant. Court: United States District Court, Northern District of California 22-cv-01904-WHO (N.D. Cal. Dec. 19, 2022); Deposition
Pacific Controls Inc.	12/12/2019 (Decision defining final scope)	PACIFIC CONTROLS, INC. v. CUMMINS INC., UNITED STATES DISTRICT COURT FOR THE SOUTHERN DISTRICT OF NEW YORK; CASE NO. 19-cv-3428 (MKV) (BCM); Deposition

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State of New York	2021	State of NY vs. Kenneth Cramer; Case: 44-1-2022-0174; Mental Hygiene Legal Service, Appellate Division, Third Judicial Dept.; Testimony
HP, Aruba	May 25, 2021	BILLJCO, LLC,. Plaintiff, vs. Case No. 2:21-cv-0018e-JRG HEWLETT PACKARD ENTERPRISE COMPANY, ARUBA NETWORKS, LLC; Eastern District Court of Texas (EDTX); Depositions (2);
Lyft	November 30, 2020	Lyft, Inc. vs. Rideshare Displays; PTAB; IPR2021-01598, -01599, - 01600, -01601, -01602; Deposition
Google, VIVINT, Ecobee	4/28/2021	ECOFACTOR, INC. v. GOOGLE LLC (Nest), Civil Action No. 6:20- cv-00075 (ADA) ECOFACTOR, INC. v. ECOBEE, INC., Case No. 6:20-cv-00078-ADA ECOFACTOR, INC. v. VIVINT, INC., Case No. 6:20-cv-00080-ADA; Western District of Texas (WDTX); Deposition and Testimony – (Google case, being appealed); Ecobee and VIVINT trial pending
GMG (Green Mountain Grill)	11/24/2020	ITC, Traeger v. GMG, In matter of CERTAIN CLOUD-CONNECTED WOOD-PELLET GRILLS AND COMPONENTS THEREOF, Investigation No. 337-TA-1237 – Deposition, Testimony;
OHD (Overhead Door)	August 2020	ITC, Overhead Door Corporation and GMI Holdings Inc. v. The Chamberlin Group (CGI), In the Matter of CERTAIN MOVABLE BARRIER OPERATOR SYSTEMS

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		AND COMPONENTS THEREOF, Investigation No. 337-TA-1209 – Report, Deposition and Testimony on 2 patents;
Draft Kings	6/17/2020	DRAFTKINGS INC. v. INTERACTIVE GAMES LLC (PTAB), IPR2020-01107 - Depositions (2)
Target	5/15/2020	TARGET CORPORATION V. PROXICOM WIRELESS, LLC; Case 2020-00903 (PTAB); Depositions (7)
Heil	September 5, 2017	SONRAI SYSTEMS, LLC V. ROMANO ET.AL, NORTHERN DISTRICT OF ILLINOIS (EASTERN DIVISION) – DEPOSITION; IN PROGRESS
Zillow	July 2, 2019	Corus Realty Holdings, Inc. v. Zillow Group Inc., et al., Case No.21:18-cv- 00847-JLR (WD. Wash) – Deposition;
Lyft	July 23, 2018	RideApp, In. v. Lyft, Inc., Case No 3:18-cv-07152-JST (U.S. District Court for the Northern District of California) – Deposition;
FedEx	Case filed August 31, 2016	Intellectual Ventures II v. Fed Ex, Eastern District Court of Texas), Civil Action No. 2:16-cv-00980- JRG. Deposition and Testimony;
Google	Declarations filed May 15, 2018	AGIS v. Google, Cases Nos. IPR 2018-01079, -01080 (PTAB), Depositions (2)
Samsung	2018	IPR2018-01554 for SAMSUNG ELECTRONICS CO., LTD. v. IRON

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		OAK TECHNOLOGIES, LLC., Patent No. 5,966,658. (Declaration, no Deposition)
A&V Oil and Gas	Internal Audit Report – 2017 August 17	A&V Oil and Gas Limited v Petrotrin Arbitration, dispute triggered by Internal Audit report by Petroleum Company of Trinidad and Tobago, Limited. – Testimony;
Gounaris Abboud Co., LPA	Indictment April 14, 2017	State of Ohio, Montgomery County v. Brandon Howard. The Court of Common Pleas. Case 2017 CR 00769/1 Docket ID: 3077144, (Video) Testimony in Daubert Hearing regarding validity of Google Timeline as forensic/location data collection tool.
John Hamilton (compensation via State of Tennessee)	Incident, December 26, 2016	State of Tennessee v. Xavier Martin (associated with State. v. Marlando Shuntell Sturghill, Docket 17-237), Testimony at trial;
Google	Declarations submitted June 24, 2015	Google Inc. (Nest), et al. v. e.Digital Corp., Case Nos. IPR2015-01470, - 01471, -01472, -01473, -1474, - 01475 (PTAB), Depositions (2);
Macropoint	PTAB Decisions: March 16, 2018, and March 19, 2018, respectively	RUIZ FOOD PRODUCTS, INC. v. MACROPOINT LLC, Case IPR2017-02016, IPR2017-02018; (PTAB); Deposition
Liberty Law (Canada)	Incident date May 10, 2016	Edmonton Alberta Law Courts, RCMP v. Travis Vader (Report), Testimony/Attendance at Trial; Report/Testimony issue
Geotab	Infringement Contentions 11/13/2015	Perdiem co, LLC vs. Industrack, LLC, et al., Case No. 2:15-cv-727- JRG-RSP (E.D. Tex.), Deposition;

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Twilio	Filed Feb 6, 2018	Twilio Inc. v. TeleSign Corp., Case No. IPR2016-00360 (Northern District of California), Deposition
City of Houston Police Department	Indefinite Suspension Issued on February 19, 2016	Houston Police Department v. Officer Ernest W. Walker, Issue #48549-2015 and #48675-2015, Report, Testified at Arbitration;
VIVINT Inc.	Institution Decision March 30, 2016	Alarm.com v. Vivint Inc., Case No. IPR2015-01965 (PTAB), Deposition;
Samsung	2013	ITC, Black Hills Media v. Samsung, In the Matter of CERTAIN DIGITAL MEDIA DEVICES, INCLUDING TELEVISIONS, BLU-RAY DISC PLAYERS, HOME THEATER SYSTEMS, TABLETS AND MOBILE PHONES, COMPONENTS THEREOF AND ASSOCIATED SOFTWARE. Consultant (no report);
Peschke Map Technologies LLC, Plaintiff (On behalf of several defendants)	Petition filed on July 2, 2013	Peschke Map Technologies LLC v. J.J. Gumberg Co, Case No. 12-cv-1525-SLR (D. Del.), Deposition;