

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UBER TECHNOLOGIES, INC.
Petitioner

v.

ENOVSYS LLC
Patent Owner.

**DECLARATION OF SCOTT ANDREWS IN SUPPORT OF
PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 6,756,918**

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LIST OF EXHIBITS¹

Ex-1001	U.S. Patent No. 6,756,918
Ex-1002	Declaration of Mr. Scott Andrews
Ex-1003	Curriculum Vitae of Mr. Scott Andrews
Ex-1004	File History of U.S. Patent No. 6,441,752
Ex-1005	File History of U.S. Patent No. 6,756,918
Ex-1006	File History of U.S. Patent No. 7,199,726
Ex-1007	U.S. Patent No. 5,731,757 (“Layson’757”)
Ex-1008	U.S. Patent No. 6,405,213 (“Layson’213”)
Ex-1009	U.S. Patent No. 5,365,451 (“Wang”)
Ex-1010	720 Ill. Comp. Stat. Ann. 5/12-7.3, as amended by 1995 Ill. Legis. Serv. P.A. 89-377 (H.B. 1792), eff. Aug. 18, 1995 (“IllinoisLaw”)
Ex-1011	U.S. Patent No. 6,160,481 (“Taylor”)
Ex-1012	U.S. Patent No. 5,497,149 (“Fast”)
Ex-1013	U.S. Patent No. 6,212,393 (“Suarez”)
Ex-1014	U.S. Patent No. 5,532,702 (“Mintz”)
Ex-1015	U.S. Patent No. 5,493,694 (“Vlcek”)
Ex-1016	U.S. Patent No. 3,663,762 (“Joel”)
Ex-1017	Australian Patent App. No. 200037767 (“Mezhvinsky”)
Ex-1018	Certified Translation of German Patent Application Publication DE 19751741A1 (“Heedfeld”)

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

Ex-1019	German Patent Application Publication DE 19751741A1
Ex-1020	Claim Mapping Table
Ex-1021	U.S. Patent No. 4,242,538 (“Ito”)
Ex-1022	U.S. Patent No. 5,736,962 (“Tendler”)
Ex-1023	U.S. Patent No. 6,133,853 (“Obradovich”)
Ex-1024	U.S. Patent Application Publication No. 2002/0034292 (“Tuoriniemi”)
Ex-1025	U.S. Patent No. 6,968,179 (“De Vries”)
Ex-1026	U.S. Patent No. 5,904,727 (“Prabhakaran”)
Ex-1027	Enovsys Infringement Contentions
Ex-1028	INTENTIONALLY LEFT BLANK
Ex-1029	Yilin Zhao, <i>Vehicle Location and Navigation Systems</i> , Artech House Publishers (1st ed. 1997)
Ex-1030	U.S. Patent No. 6,901,260 (“Xin”)
Ex-1031	U.S. Patent No. 5,592,173 (“Lau”).
Ex-1032	U.S. Patent No. 6,748,224 (“Chen”)
Ex-1033	U.S. Patent No. 5,208,756 (“Song”)
Ex-1034	Joseph Hoshen, et al., <i>Wide Area Continuous Offender Monitoring</i> , Lucent Technologies, New Mexico Corrections Dept., Sandia National Laboratories (1996)
Ex-1035	U.S. Patent No. 5,461,390 (“Hoshen”)
Ex-1036	Soumia Ichoua, et al., <i>Diversion Issues in Real-Time Vehicle Dispatching</i> , <i>Transportation Science</i> , INFORMS (2000)
Ex-1037	Rebecca K. Lee, <i>Romantic and Electronic Stalking in a College Context</i> , 4 Wm. & Mary J. Women & L. 373-466 (1998) (“Lee”)
Ex-1038	U.S. Patent No. 5,982,281 (“Layson’281”)

Ex-1039	J. Hoshen and G. Drake, <i>Offender Wide Area Continuous Electronic Monitoring Systems: Project Summary</i> , National Institute of Justice, report NCJ 187102 (2000)
Ex-1040	<i>Project To Develop a Model Anti-Stalking Code for States</i> , National Criminal Justice Association, National Institute of Justice, report NCJ 144477 (Oct. 1993)
Ex-1041	U.S. Patent No. 5,266,944 (“Carroll”)
Ex-1042	International Patent Pub. No. WO 96/20464 (“Green”)
Ex-1043	U.S. Patent No. 6,072,396 (“Gaukel”)
Ex-1044	J. Travis, <i>Stalking: Lessons from Recent Research</i> , National Center for Women and Policing Conference (Apr. 14, 1999)
Ex-1045	<i>Domestic Violence, Stalking, and Antistalking Legislation – An Annual Report to Congress under the Violence Against Women Act</i> , National Institute of Justice Research Report (Apr. 1996)
Ex-1046	Emily Spence-Diehl, <i>Stalking – A Handbook for Victims</i> , Learning Publications, Inc. (1999)
Ex-1047	<i>The Crime of Stalking: How Big Is the Problem?</i> , National Institute of Justice Research Preview (Nov. 1997)
Ex-1048	Brian E. McGuire & Anita E. Wraith, <i>Legal and Psychological Aspects of Stalking: A Review</i> , The Journal of Forensic Psychiatry, Vol. 11, No. 2 (Sept. 2000)
Ex-1049	David D. Clark, Kenneth T. Pograd, and David P. Reed, <i>An Introduction to Local Area Networks</i> , Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978)
Ex-1050	Ivan Pepelnjak and Jim Guichard, <i>MPLS and VPN Architectures – A practical guide to understanding, designing and deploying MPLS and MPLS-enabled VPNs</i> , Cisco Press (2001)
Ex-1051	Excerpts from C. J. Date, <i>An Introduction to Database Systems</i> , The Systems Programming Series, Addison-Wesley Publishing Co., (6th ed. 1995)

Ex-1052	Excerpts from Elmasri Navathe, <i>Fundamentals of Database Systems</i> , Addison-Wesley (3rd ed. 2000)
Ex-1053	John J. Moslow, <i>False Alarms: Cause for Alarm</i> , 63 FBI Law Enforcement Bulletin 63, No. 11 (Nov. 1994)
Ex-1054	J. Reid Meloy, <i>Stalking (Obsessional Following): A Review of Some Preliminary Studies</i> , Aggression and Violent Behavior, Vol. 1, No. 2, pp. 147-162 (1996)
Ex-1055	Paul E. Mullen et al., <i>Study of Stalkers</i> , Am. J. Psychiatry 156:8 (Aug. 1999)

I. INTRODUCTION

1. I have been retained by Uber Technologies, Inc. (“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 Uber’s Counsel (“Counsel”) to consider whether certain references disclose, teach, and/or suggest the features recited in Claims 1-2, 15, and 22 of U.S. Patent No. 6,756,918 (“the ’918 Patent”) (Ex-1001), currently assigned to Enovsys LLC (“PO”). 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 \$500 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 judgement. In forming my opinions, I have relied on my knowledge and experience in designing, developing, researching, and teaching the technology referenced in this Declaration.

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 Ex-1003. 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 professional experience in the field of mobile devices and technologies and systems, including handheld communications and navigation devices, vehicle information systems and vehicle safety and control systems, and the sensor systems that are used in these devices. Further, I have authored numerous published technical papers and am a named inventor on 13 U.S. and foreign patents.

7. I received a Bachelor of Science degree in Electrical Engineering from the University of California, Irvine in 1977 and a Master of Science degree in Electronic Engineering from Stanford University in 1982.

8. From 1977 to 1979, I worked at Ford Aerospace where I designed, tested, and delivered microwave radar receiver systems.

9. From 1979 to 1983, I worked at Teledyne Microwave, where I developed high reliability microwave components and developed CAD tools.

10. From 1983 to 1996, I worked at TRW, Inc., having held various positions. From 1983 to 1985, I was a Member of the technical staff and a Department Manager in the Space Electronics sector. Between 1985 and 1990, I was

a project manager working on various communications systems projects, including the U.S. Department of Defense Advanced Research Projects Administration (ARPA) MIMIC Program. Between 1990 and 1993, I was the Manager of MMIC (monolithic-microwave-integrated-circuit) Products Organization. In this role, I developed business strategy and managed customer and R&D programs. During this time, I also developed the first single chip 94 GHz Radar, used for automotive cruise control and anti-collision systems. In 1993, I transferred to the TRW Automotive Electronics Group, and managed about 30 engineers in the Systems Engineering and Advanced Product Development organization. In this role, I managed advanced development programs such as automotive radar, adaptive cruise control, occupant sensing, automatic crash notification systems, in-vehicle information systems, and other emerging transportation products.

11. During this time, I also worked with various types of location determining equipment. For example, one system I developed in 1992 used a pager-based system that triangulated the user's position, and then used that position to provide information about and direction to user-selected points of interest.

12. I was employed as a Project General Manager in the Electronics Division of Toyota Motor Corporation at Toyota headquarters in Toyota City, Japan from April 1996, to around April 2000. In this position, I was responsible for leading the development of vehicle telematics systems, infotainment systems, including on-

board and off-board navigation systems, mobile device integration systems, traffic information systems, vehicle communications systems, safety applications, and automated vehicle control systems. At this time, global positions system (GPS) equipment had become inexpensive enough that nearly all of the location-based systems we developed relied on GPS to determine the user/vehicle location. In particular, between 1997 and 2000, I was responsible for the development of several vehicle tracking systems in the United States and Europe. These systems used a GPS receiver coupled with a cellular telephone transceiver and a processor to provide the vehicle position and other status information to a monitoring center. In this capacity, I met with and reviewed the in-vehicle and back-office systems offered by numerous service providers. All of the systems I reviewed would monitor the status of various vehicle systems and alert service provider operators if, for example, the vehicle had experienced a crash (indicated by an airbag activation) or had been stolen. The operator would then open a voice channel to the vehicle occupants, determine the extent of any assistance required, and dispatch appropriate help (tow truck, paramedics, etc.). These systems also responded to vehicle theft and allowed the operator to perform various vehicle functions such as locking and unlocking doors and performing various vehicle diagnostics. One provider, ATX, had a system that was marketed to high net worth individuals that included a feature wherein a parent could define a geographic boundary on a map using a web browser. This boundary

would be used to issue an alert to the parent if their teen driver ventured outside this so-called “geofence.”

13. Since late 2001, I have been a consultant for Cogenia Partners, LLC, focusing on systems engineering, business development, and technical strategy supporting automotive and information technology. I have been in this position since 2001. Between 2006 and 2010, I served as the chief system architect for the U.S. Department of Transportation sponsored Vehicle Infrastructure Integration (VII) program (later known as “Intellidrive,” and currently referred to as “connected vehicles”). This was a location-based system using GPS to determine the position of the vehicle, and a short-range radio data system to provide information to the vehicle from the roadside, to collect information from the vehicle (for example, for traffic measurement), and to exchange information between vehicles to support various safety applications. As part of this project, I provided extensive background support for the U.S. DOT ITS Joint Program Office about positioning systems and their capabilities and limitations.

14. Between 2010 and 2019, I served on various other U.S. DOT projects associated with connected vehicles. For example, recently I was the technical lead on a project funded by the National Highway Traffic Safety Administration (NHTSA) to develop requirements for connected vehicle safety systems in preparation for NHTSA regulations governing such systems. I also served as a

technical consultant on multiple projects sponsored by the Federal Highway Administration (FHWA) related to connected vehicle technology research. In one FHWA project I developed a precision location and timing system that was able to record and report the user vehicle location to an accuracy of about 1 cm and time with an accuracy of about 100 nanoseconds. This system allowed us to track the precise trajectory of a vehicle as it moved through a test facility and supported the accurate characterization of other systems being tested.

15. In the various positions mentioned above, I was responsible for research and development projects relating to numerous mobile information systems, navigation systems, user interface systems, sensory systems, control systems, and safety systems, and also had the opportunity to collaborate with numerous researchers and suppliers to the auto industry. I therefore believe that I have a detailed understanding of the state of the art during the relevant period, as well as a sound basis for opining on how persons of skill in the art at the time would have understood the technical issues in this case.

III. INFORMATION CONSIDERED

16. In preparation for this Declaration, I have considered the materials discussed in this Declaration, including, for example, the '918 Patent, the references cited by the '918 Patent, the prosecution history of the '918 Patent, 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

17. 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

18. I have been informed and understand that in an IPR proceeding, claims are to be interpreted according to the Phillips claim construction standard. I have been informed and understand that claim construction is a matter of law and that the final claim constructions for this proceeding will be determined by the Patent Trial and Appeal Board (“PTAB”).

B. Perspective of One of Ordinary Skill in the Art

19. I have been informed and understand 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 understand 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. Obviousness

20. I have been informed and understand 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.

21. I understand 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).

22. I understand 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 understand 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 further understand that a POSITA is presumed to know the relevant prior art. I understand that the obviousness analysis may take into account the inferences and creative steps that a POSITA would employ.

23. In determining whether a prior art reference would have been combined with other prior art or other information known to a POSITA, I understand 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 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.

24. I understand 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 understand, however, that such a teaching, suggestion, or motivation to combine is not required.

V. LEVEL OF ORDINARY SKILL IN THE ART

25. In my opinion, a person of ordinary skill in the art would have had a bachelor's degree in electrical engineering, computer engineering, computer science, or a related field, and at least two years of experience in the research, design, development, and/or testing of GPS and related location tracking techniques, or the equivalent, with additional education substituting for experience and vice versa. I base this opinion on my experience working on systems similar to those described

in the '918 Patent, and my experience hiring and managing engineering staff performing engineering development work on similar systems.

26. Based on my education, training, and professional experience in the field of the claimed invention, I am familiar with the level and abilities of a person of ordinary skill in the art at the time of the claimed invention. Additionally, I met at least these minimum qualifications to be a person having ordinary skill in the art at least as of December 30, 2000. Further, although my qualifications may exceed those of the hypothetical person having ordinary skill in the art defined above, my analysis and opinions regarding the '918 Patent have been rendered from the perspective of a person having ordinary skill in the art at the time of the invention.

VI. PRIORITY DATE

27. I understand that the application that issued as the '918 Patent was filed on December 30, 2000. I further understand that all prior art references were published and/or filed well before the filing date of this '918 Patent.

VII. CLAIM CONSTRUCTION

28. I have been asked to apply the following constructions for my analysis, for those claim terms reciting “means.”² I understand from Counsel that the

² I understand that, for each of the claimed “means” terms discussed below, Petitioner is required to identify disclosed structure/algorithm in the '918 Patent that relates to the recited function. I understand Petitioner has identified the algorithm in the '918 Patent that relates to the recited function for the “means” terms in

challenged claims recite elements that use the word “means,” creating a rebuttable presumption that it is a means-plus-function element under Pre-AIA 35 U.S.C. § 112(6). I understand that interpreting a means-plus-function limitation involves two steps: (1) identifying the recited function and (2) identifying the structure disclosed in the specification for performing the recited function.

29. I do not believe that any of the remaining terms (other than those identified below) require construction for the purposes of resolving the issues in this Declaration. I apply the plain and ordinary meaning to the rest of the claim terms, as that plain and ordinary meaning would have been understood by a POSITA.

A. Proposed Constructions

1. “means to obtain the location of the portable mobile remote unit” (Claim 1)

30. This limitation uses the phrase “means to,” and I understand it is presumed to invoke 35 U.S.C. § 112(6).

31. The recited function for this means-plus-function limitation is “to obtain the location of the portable mobile remote unit.”

32. Based on the '918 Patent, the minimum necessary structure to perform

accordance with what appears to be the algorithm identified in Patent Owner’s infringement contentions. I agree that the structures/algorithms identified by Petitioner are structures/algorithms in the '918 Patent that are related to the recited functions. I have not been asked to consider, and I have not considered, whether these identified structures are sufficient for performing the recited functions.

the recited function is “an antenna 20 and a transceiver circuitry 21” (Ex-1001, 4:62-65) configured to receive signals (*id.*, 4:55-58), together with a “control unit” (*id.*, 4:65-5:1) programmed to use such signals to determine location (*id.*, 5:11-16), and equivalents thereof.

2. “means to obtain geographic boundary information in order to disclose a global location at the network” (Claim 1)

33. This limitation uses the phrase “means to,” and I understand it is presumed to invoke 35 U.S.C. § 112(6).

34. The recited function for this means-plus-function limitation is “to obtain geographic boundary information in order to disclose a global location at the network.”

35. Based on the '918 Patent, the minimum necessary structure to perform the recited function is “an antenna 20 and a transceiver circuitry 21” (Ex-1001, 4:62-65) configured to receive signals that include geographic boundary information (*id.*, 5:51-55) and to transmit location information (*id.*, 5:11-16), and equivalents thereof.

3. “means to provide the location of the portable mobile remote unit to the network upon determination that the portable mobile remote unit is within the geographic boundary obtained at the network” (Claim 1)

36. This limitation uses the phrase “means to,” and I understand it is presumed to invoke 35 U.S.C. § 112(6).

37. The recited function for this means-plus-function limitation is “to

provide the location of the portable mobile remote unit to the network upon determination that the portable mobile remote unit is within the geographic boundary obtained at the network.”

38. Based on the '918 Patent, the minimum necessary structure to perform the recited function is “an antenna 20 and a transceiver circuitry 21” (Ex-1001, 4:37-45) configured to transmit location information (*id.*, 4:53-58), together with a “control unit” (*id.*, 4:43-46) programmed to determine that the unit is within the geographic boundary (*id.*, 5:38-39), and equivalents thereof.

4. “means to determine and report to the system upon request that, another mobile remote unit of the network has tracked the portable mobile remote over a period of time” (Claim 1)

39. This limitation uses the phrase “means to,” and I understand it is presumed to invoke 35 U.S.C. § 112(6).

40. The recited function for this means-plus-function limitation is “to determine and report to the system upon request that, another mobile remote unit of the network has tracked the portable mobile remote over a period of time.”

41. Based on the '918 Patent, the minimum necessary structure to perform the recited function is a control unit (Ex-1001, 4:38-40) programmed to: (1) receive, at intervals, the location of the “tracked” mobile unit (*id.*, 5:48-51, 5:59-63, 6:1-2, Fig. 5-step 3), (2) receive the locations of “other” mobile units, during such intervals (*id.*, 5:51-55, 5:59-63, Fig. 5-step 4), (3) maintain a list of such “other” units within

a predefined geographic boundary of the “tracked” unit for a period of time as the tracked unit and such “other” units have moved a minimum distance³ (*id.*, 5:37-42, 6:58-64, Fig. 5-step 7, Fig. 5-step 10), together with a transmitter (*id.*, 4:40-43) configured to transmit a message identifying such “other” unit(s) (*id.*, 5:37-42), and equivalents thereof. The control unit may be within the tracked mobile unit or a network control center. Ex-1001, 5:44-48, 6:48-56 (similar).

5. “means to further determine if location disclosure for the remote unit is prohibited at a specific geographic boundary before sending its location to the network” (Claim 2)

42. This limitation uses the phrase “means to,” and I understand it is presumed to invoke 35 U.S.C. § 112(6).

43. The recited function for this means-plus-function limitation is “to further determine if location disclosure for the remote unit is prohibited at a specific geographic boundary before sending its location to the network.”

44. Based on the ’918 Patent, the minimum necessary structure to perform the recited function is a control unit (Ex-1001, 5:1-4) programmed to (1) compare its current location to an exclusion zone (*id.*, Figure 6, step 4); (2) if its current

³ I have been asked to adopt and apply this construction herein. If Patent Owner or the Board adopts a construction that does not require a “minimum distance” as part of the algorithm that performs the recited function, then Claims 1 and 2 are rendered obvious by the Layson’757-Layson’213 combination and the Taylor-Fast combination without the need to rely on IllinoisLaw, as explained in further detail in the Grounds below.

location is within the exclusion zone, abort (*id.*, Figure 6, step 5); (3) otherwise, proceed to provide its current location to the network (*id.*, Figure 6, step 7), and equivalents thereof.

6. “means to request whether the at least second communication unit is tracking the at least first communication unit” (Claim 22)

45. This limitation uses the phrase “means to,” and I understand it is presumed to invoke 35 U.S.C. § 112(6).

46. The recited function for this means-plus-function limitation is “to request whether the at least second communication unit is tracking the at least first communication unit.”

47. Based on the '918 Patent, the minimum necessary structure to perform the recited function is either “antenna 20 and transceiver circuitry 21” (Ex-1001, 4:62-65) configured to transmit tracking requests (Ex-1001, 5:44-48), or “input panel 25” configured “to take user instructions” (Ex-1001, 5:8-10) in the form of tracking requests (Ex-1001, 5:33-37), and equivalents thereof.

7. “means to determine from said location provided (ii) that the at least first and second communication unit maintained proximity while in motion during said time” (Claim 22)

48. This limitation uses the phrase “means to,” and I understand it is presumed to invoke 35 U.S.C. § 112(6).

49. The recited function for this means-plus-function limitation is “to

determine from said location provided (ii) that the at least first and second communication unit maintained proximity while in motion during said time.”

50. Based on the '918 Patent, the minimum necessary structure to perform the recited function is a control unit (Ex-1001, 4:38-40) programmed to: (1) receive, at intervals, the location of the at least first communication unit (*id.*, 5:48-51, 5:59-63, 6:1-2, Fig. 5-step 3), (2) receive the location of the at least second communication unit during such intervals (*id.*, 5:51-55, 5:59-63, Fig. 5-step 4), (3) maintain a list of second communication unit(s) within a predefined geographic boundary of the at least first communication unit for a period of time as the at least first communication unit and the at least second communication unit(s) have moved a minimum distance⁴ (*id.*, 5:37-42, 6:58-64, Fig. 5-step 7, Fig. 5-step 10), and equivalents thereof. The control unit may be within the “another portable mobile remote unit” or a network control center. Ex-1001, 5:44-48, 6:48-56 (similar).

8. “means to provide result of the determination (iv) to the requestor of (iii)” (Claim 22)

51. This limitation uses the phrase “means to,” and I understand it is

⁴ I have been asked to adopt and apply this construction herein. If Patent Owner or the Board adopts a construction that does not require a “minimum distance” as part of the algorithm that performs the recited function, then Claim 22 is rendered obvious by the Layson'757-Layson'213 combination and the Taylor-Fast combination without the need to rely on IllinoisLaw, as explained in further detail in the Grounds below.

presumed to invoke 35 U.S.C. § 112(6).

52. The recited function for this means-plus-function limitation is “to provide result of the determination (iv) to the requestor of (iii).”

53. Based on the '918 Patent, the minimum necessary structure to perform the recited function is either a transmitter (*id.*, 4:40-43) configured to transmit the result of the determination to a device belonging to the requestor (Ex-1001, 6:53-56), or “display 23” (Ex-1001, 5:9-10) configured to display the result of the determination to the requestor (Ex-1001, 5:37-41), and equivalents thereof.

VIII. TECHNOLOGY BACKGROUND

54. To provide background for the element-by-element analysis of the claims to follow, below I will present an overview of the state of the art existing at the time of the alleged invention relating to geolocation generally, and as it relates to locating mobile devices or individuals, among other relevant technology. As I will describe below from a high-level functional perspective, in the next section based on specific prior art, and then in subsequent sections on a limitation-by-limitation basis, all of these technologies were well-known to those of ordinary skill in the art at the time of the alleged invention claimed in the '918 Patent, and a POSITA would have readily understood the combination of elements of Claims 1-2, 15, and 22 to have been obvious.

A. Location Determination Techniques

1. Geolocation Generally

55. Navigation, electronic monitoring, and numerous other safety and convenience systems rely on determining the state⁵ of a vehicle (aircraft, ship, car, etc.) or other mobile unit with reasonable accuracy. This position can then be used to locate the vehicle/mobile unit on a map, for example to inform or support the user, or to control the position of the vehicle/mobile unit relative to known structures or hazards.

56. Traditionally, navigation has used two methods for determining location. Celestial navigation and what is known as “Dead Reckoning.” Celestial navigation involves measuring the positions of stars and planets at known times, and then converting those measurements to a position estimate using tables describing the well-established motions of these celestial objects. This celestial navigation process involves measuring the elevation of the object from the horizon using a telescope-like device called a sextant. By noting the name of the object, the elevation and the time, the observer can then determine where on the earth the object would be visible at that elevation at that specific time. As shown in Figure 1, an object in the sky will be observed at a specific elevation at a specific time only when viewed

⁵ In general, this state is represented by a set of state parameters that include latitude, longitude, altitude or elevation, time, speed heading, and other related information.

from anywhere on a unique circle on the earth's surface.

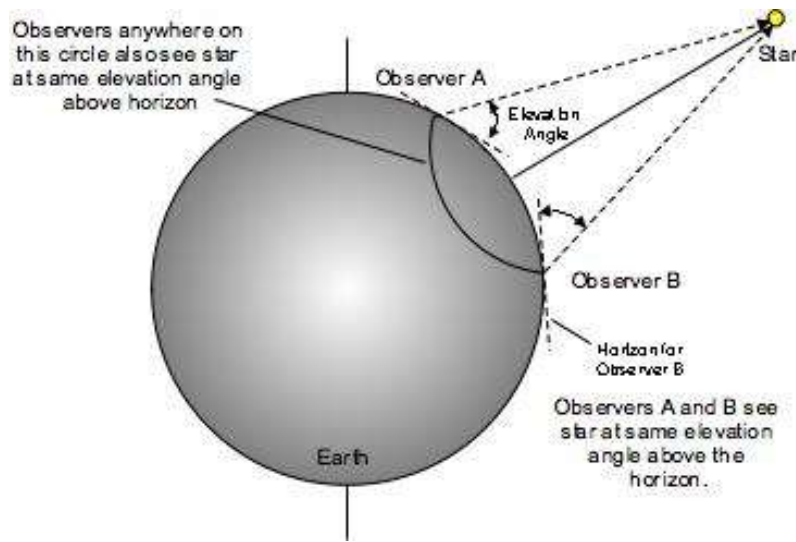


Figure 1
Star Viewed From Two Points on Earth Shows Same Elevation Angle

57. The observer uses a detailed table of the orbits of bright stars, the sun, the moon, and the planets (depending on what celestial object is being observed) to determine exactly where this circle (or a small segment of it in his local vicinity) is on the Earth's surface. This table is called an ephemeris.

58. So, by measuring one object the observer knows he is somewhere on that circle. By measuring two objects, he can define two circles, and his position is one of the two places where the circles intersect. As shown in Figure 2, by measuring a third object, and thereby creating a third circle, the observer can resolve his position to the one place where all three circles cross. More object measurements will produce more overlapping circles, and thus the more confident the observer can be in the accuracy of the position estimate.

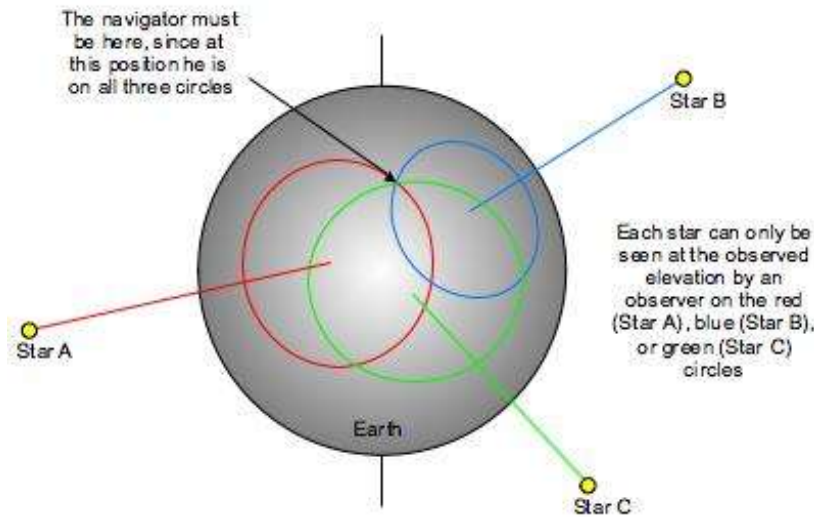


Figure 2
Multiple Observations Produce Multiple Position Lines.
Point of Mutual Intersection Is Position.

59. Dead reckoning uses a known location of a starting point (originally a point of land, or a buoy in a harbor). As a vehicle/mobile unit moves, its heading and speed are recorded, and each time the heading or speed changes, a new record is made (originally, for ships, this record was made in the ship's log), thereby creating a chain of vectors with direction according to the heading at that time, and distance equal to the speed multiplied by the time on that course. By linking together these changes, the navigator can plot the course traveled and determine roughly where they are after traveling some distance over time.

60. These two methods (dead reckoning and celestial navigation) have served navigators well for centuries, but they have serious drawbacks. Celestial navigation lacks fine accuracy (because you have to measure the elevation of a star from the horizon, and this may be challenging on the deck of a floating ship or a

flying aircraft, and is impractical in a moving automobile) and it suffers greatly from the fact that it cannot be used effectively in daylight or under cloud cover. Dead reckoning assumes that speed and heading can be measured reasonably accurately, but it does not inherently take into account effects from errors in these measurements either from the sensor errors, or from external effects such as current or wind. Dead reckoning works well over short distances, but if used for a long time, the errors in heading and speed measurement accumulate, and the position estimate can drift off of the true position by significant amounts.

2. Global Positioning System (GPS)

61. To provide a more reliable and accurate alternative to celestial navigation, the U.S. government built a constellation of satellites known as the Global Positioning System (GPS).⁶ This system operates in a way reminiscent of celestial navigation, but re-created in an electronic form.

62. The satellites are arranged in earth orbit in a way that allows several of them to always be visible from any point on the globe. As a result, it is possible to use the system at any time of day, and under most weather situations. In operation, the satellites transmit a repeating signal that contains a variety of information used

⁶ The GPS system is variously known as the Global Navigation Satellite System (GNSS), Navistar, and simply the Global Positioning System (GPS). Its European counterpart is the Galileo System, and a Russian counterpart is known as GLONASS. All of these systems operate similarly.

by a receiver to determine the orbital location of the satellite, and also the time delay from when the signal was sent to when it was received by the receiver.

63. By measuring the time delay from the satellite, it is possible to determine the distance between the satellite and the receiver. This distance represents the radius of a sphere centered on the satellite. With the distance to one satellite the user will know they are somewhere on that sphere. If the distance to two satellites is known, the user will know they are somewhere on the intersection of the two spheres (a circle), and if three satellites are known, they will know they are at the point where the three spheres (and accordingly, the three circles formed by the intersections of each pair of spheres) intersect. In practice, four satellite signals are generally required in order to correct for the fact that the receiver does not have a highly accurate atomic clock, so the addition of a fourth signal allows the determination of position in three dimensions, and the current GPS time.

64. The determination of the position of the receiver is done by solving a system of equations, known as “the GPS equation.” This is shown below.⁷

⁷ See Vehicle Location and Navigation Systems by Yilin Zhao, ©1997, Artech House, Inc., ISBN 0-89006-861-5 (Ex-1029), 0069.

$$\begin{aligned}p_1 &= \sqrt{(x - x_1)^2 + (y - y_1)^2 + (z - z_1)^2} + c(dt - dT_1) \\p_2 &= \sqrt{(x - x_2)^2 + (y - y_2)^2 + (z - z_2)^2} + c(dt - dT_2) \\p_3 &= \sqrt{(x - x_3)^2 + (y - y_3)^2 + (z - z_3)^2} + c(dt - dT_3) \\p_4 &= \sqrt{(x - x_4)^2 + (y - y_4)^2 + (z - z_4)^2} + c(dt - dT_4)\end{aligned}$$

65. In this equation, p_i represents the measured pseudo-range for satellite 1 (where 1 is the number of the satellite); x_1 , y_1 and z_1 represent the position of satellite 1; x , y , and z represent the position of the receiver. Indices 2-4 in the remaining three equations represent similar quantities (pseudo-range, x , y , and z position, and time delay) related to additional satellites 2-4. The term dt represents the offset between the receiver clock and the time the satellites transmitted their signals; and dT_i is a time correction term for the i^{th} satellite. x_i , y_i , z_i , and dT_i are derived from the GPS Navigation message.

66. This equation with four measured pseudo-ranges (from four satellites) represents a system of four equations with four unknowns (x , y , z and dt). If signals from only four GPS satellites are received, then the GPS receiver solves this system of four equations and four unknowns, and thereby determines x , y , z and dt . That is, its x , y , and z position and the time offset between its clock and the satellite clock. (See, e.g., Ex-1029, pages 69-70.). If more than four signals are present, then the

satellite has what is known as an “over specified” system of equations, and it then uses well-known approximation methods such as Least Squares or Newton’s method to obtain a best fit solution.

67. To perform these computations the receiver must also obviously know the orbital positions of the satellites, x_i , y_i , and z_i at the time the signals were sent, and any offsets between the satellite clocks dT_i . This information is computed based on information contained in the GPS navigation message. The GPS receiver uses the bits of the GPS navigation message from each satellite to determine the pseudo-range for that satellite, but over time, it also uses information contained in the message itself (coded in the bits of the message) to determine the orbital path for each satellite, and thus the x_i , y_i , and z_i position of the satellite in its orbit at the time the signal was sent.

68. The GPS receiver also performs other measurements on the signals in order to determine its speed and direction. Specifically, since the frequency of the satellite signals is known, measuring the observed frequency of each satellite signal, which will be Doppler-shifted as a result of the relative velocity of the satellite and the receiver, allows the receiver to determine its own speed and heading. For example:

Velocity measurements are based on the Doppler frequency shift principle. The Doppler shift in the frequency of each satellite is a direct measure of the relative velocity of the receiver and the satellite along

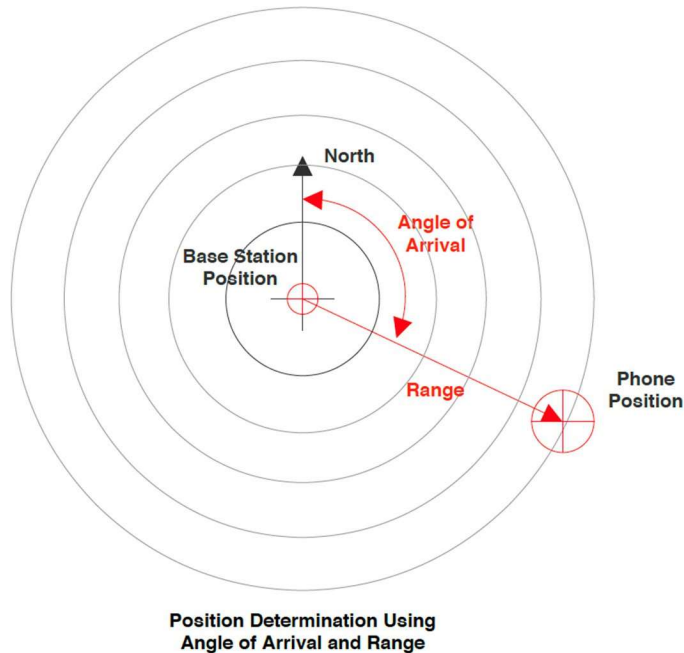
the line between them. Each satellite has a very high velocity relative to a stationary receiver, both because of the orbital motion of the satellite and because of the motion of the receiver associated with the Earth's rotation. The velocity solution can be calculated by differentiating the four dimensional navigation solution (pseudorange equations) introduced earlier with respect to time.

Ex-1029, 0071.

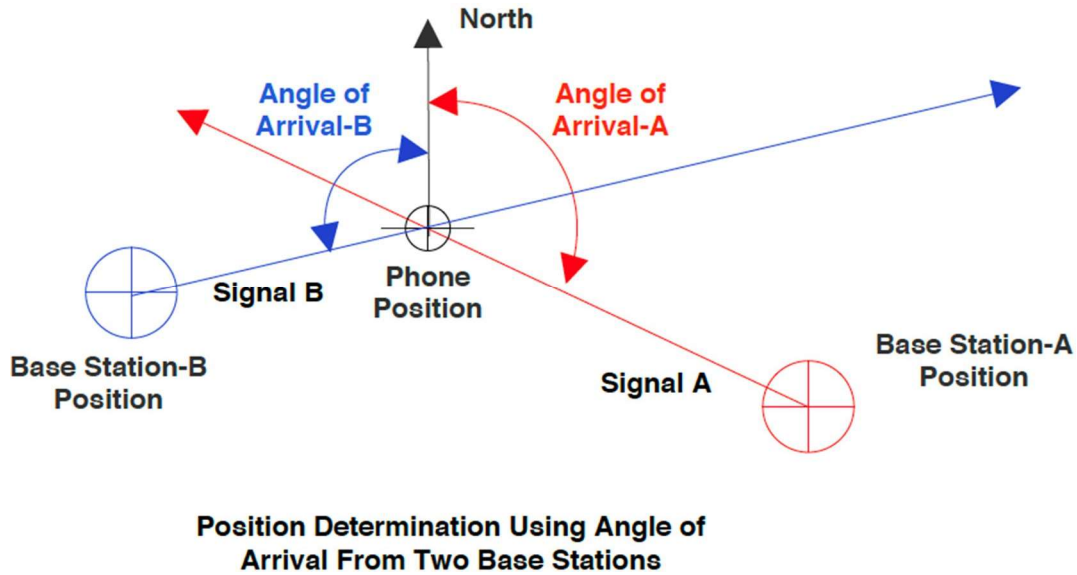
69. Specifically, if the position and direction (i.e., orientation of the orbit) of each satellite relative to the receiver are known, it is a simple matter to determine the (relative) velocity vector for the receiver relative to each satellite. These vectors can then be resolved to determine the speed and heading of the receiver on the earth.

3. Cellular/Base Station Positioning

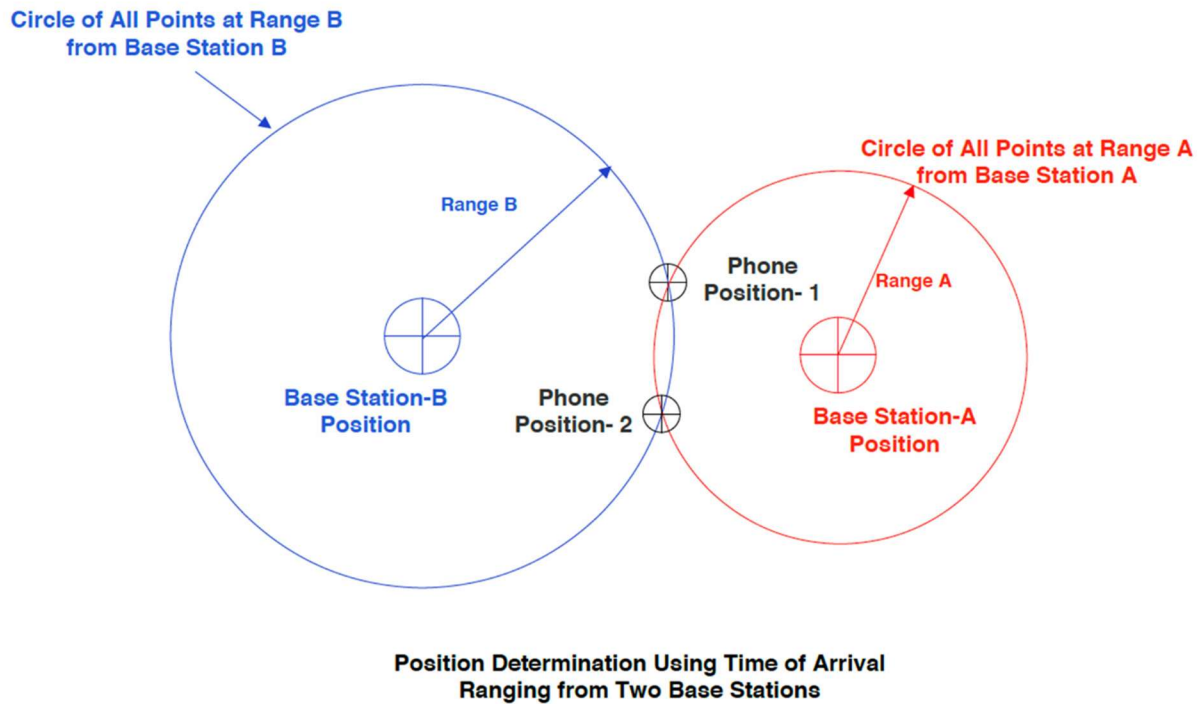
70. An alternative to GPS is the use of cellular signals to triangulate the position of a cell phone. There are several different basic forms of triangulation that can be used. The simplest is based on a signal measurement from a base station. It uses a concept known as angle of arrival (AOA) wherein the bearing direction from the phone to the base station is estimated using a directional antenna, and the range is estimated using the signal strength. Knowing the direction and range between the base station and the phone, as well as the position of the base station, the approximate position of the phone can be estimated. This approach is illustrated below. The accuracy of this method of position determination depends on the accuracy of the range measurement, which is generally somewhat prone to error.



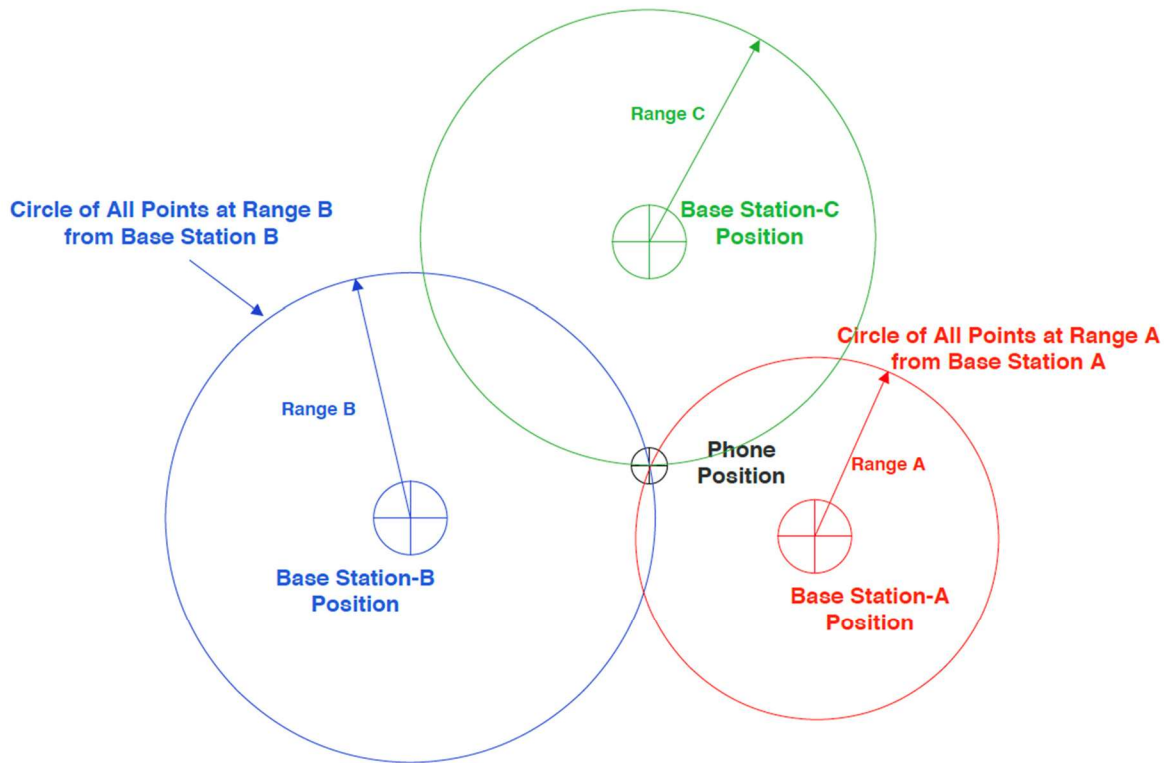
71. A somewhat more accurate AOA method is to measure the angle of arrival between two base stations. This can be done with either a signal from each base station received at the phone (forward link AOA) or using a signal from the phone received by two base stations (return link AOA). In this approach the cellphone or the base stations must determine the direction the signal is arriving from. Here the position of the cell phone is at the point where the bearing lines between the phone and two base stations intersect, as shown below. The accuracy of this method depends on the accuracy of the angle of arrival measurement. While this approach is very simple, in practice it is seldom used, because measuring bearing using fairly low frequency radio signals without sophisticated antennas is difficult and prone to errors.



72. An alternate method that is used is known as “Time Of Arrival” (TOA). Since the cellular base station locations are known, it is a fairly simple matter to determine the distance between the cellular phone and the base station by measuring signal time of flight. As with celestial navigation and GPS, if the distance to one base station is known, it can be determined that the cell phone is located on a circle whose radius would create that time delay. If the distance to two base stations is known, then the position of the phone is at one of the two points where the circles associated with the delay to each of the two base stations intersect. And, if three distances are known the three resulting circles will intersect at only a single location, and this is the position of the cell phone. This is illustrated in the figure below.



73. As can be seen in the figure, there is some uncertainty in the position of the phone because there are two possible locations where the range circles cross. This ambiguity can be resolved by using range measurements from three base stations as shown below.



**Position Determination Using Time of Arrival
Ranging from Three Base Stations**

74. In actual practice, the *differences* between the signal flight times is used rather than trying to measure absolute flight time (similar to the way GPS uses “double differencing” to avoid local time errors), so this variation is known as “Time Difference Of Arrival” (TDOA).

75. Within AOA and TDOA/TOA systems, there are so-called “forward link” and “return link” approaches, and sometimes these may be combined. Forward link means that the signals sent from the base stations are received by the cell phone; the cell phone determines the time differences and computes its position. Return link means that the cell phone emits a signal that is received by multiple base stations,

and the base stations then communicate to determine the location of the cell phone, which location is then subsequently sent back to the cell phone.

76. Various enhancements and refinements of these triangulation based positioning methods are also used. These methods of triangulation using cellular signals were well known as of the filing date of the '726 patent. For example, U.S. Patent No. 6,748,224 to Chen (Ex-1032), filed on December 16, 1998, describes a "local positioning system (LPS) uses the radio propagation parameters in a CDMA forward link or TDMA reverse link to establish a mobile station's position. Ex-1032, Abstract. Chen further describes that the system is based on TDOA. For example: "The LPS is based on TDOA which uses measured phase shift or chip offset information of the pilot channel signals transmitted from particular base stations that are "visible" to the mobile station. A TDOA triangulation approach requires time or propagation delay measurements from at least three "visible" base stations. Ex-1032, 3:51-56.

77. U.S. Patent No. 6,889,053 to Chang (Ex-1033), filed on July 26, 1999, describes a mobile phone location system based on a model of signal characteristics such as the received signal strength as a function of location. For example:

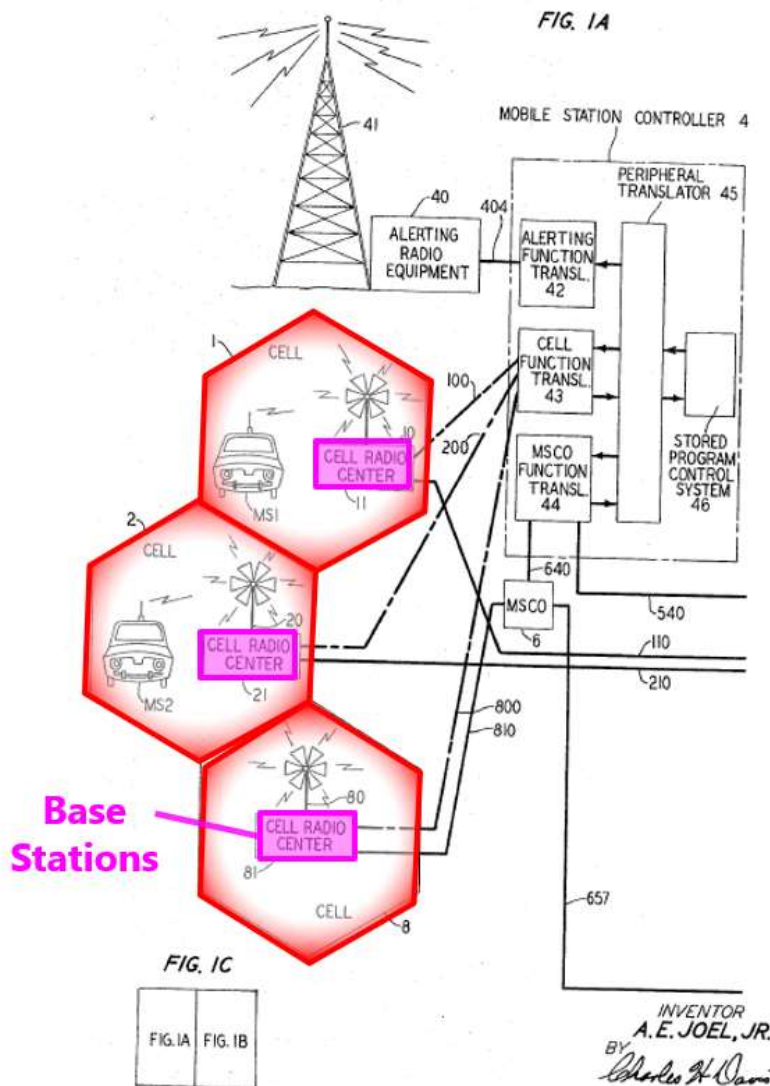
The location of a mobile wireless communication unit in the service area of a CDMA communications system is predicted utilizing two likelihood functions that define maximum likelihood estimators of the mobile unit's location, based on attribute measurements, such as but not limited to pilot signal strength, being made at the location of the mobile

unit and reported back to a base station. One of the likelihood functions comprises a frequentist likelihood function and the other comprises a Bayesian-modified likelihood function. The likelihood functions are based on the assumption that there is an RF model which provides the probability a mobile unit is able to detect one or more attributes associated with an arbitrary base station, given it is located at an arbitrary location within the service area.

Ex-1033, Abstract.

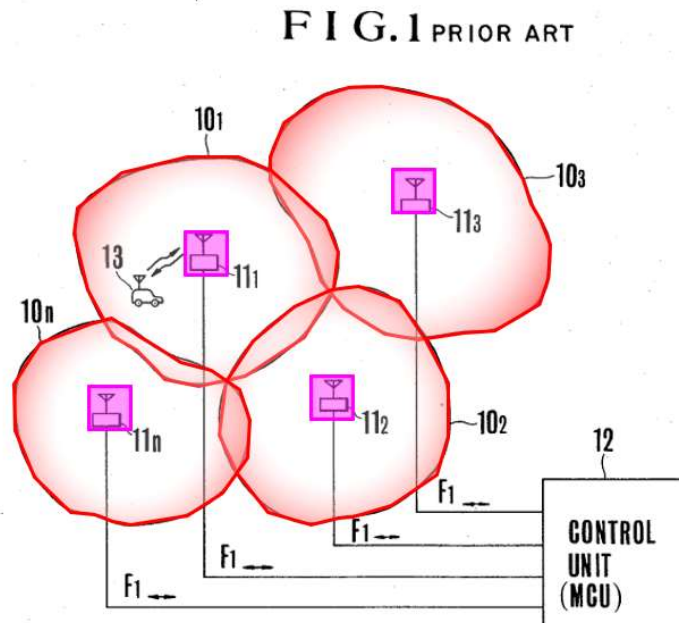
78. Moreover, the methods of establishing cells around the base stations which monitor the nearby region was well understood as of the filing date of the '726 patent. For example, U.S. Patent No. 3,663,762 to Joel (filed December 21, 1970 and issued May 16, 1972) is titled "Mobile communication system" and describes "high capacity cellular mobile communication system arranged to establish and maintain continuity of communication paths to mobile stations passing from the coverage of one radio transmitter into the coverage of another radio transmitter." Ex-1016, Abstract. Joel described that at the time, there was a need for "a mobile communication system capable of locating predetermined mobile stations in a plurality of cell areas each served by a base station" and "an arrangement to establish and maintain continuity of communication paths extending between mobile stations and between mobile stations and fixed stations as located mobile stations move in and between different cell areas." *Id.*, 2:17-24. Joel graphically provides the solution of subdividing a geographical area into smaller radio coverage areas/cells in Figure 1 (below). *Id.*, 3:24-29. Each cell (red) is provided with a base radio station

(pink) designated as cell radio centers 11, 21 and 81 which are assigned two-way radio data channel and a plurality of two-way radio communication channels for the purpose of establishing communication links with mobile stations within the cell area. *Id.*, 3:29-35.



79. Cell subregions was also described in U.S. Patent No. 4,242,538 to Ito et al. (Ex-1021), titled "Radio channel control systems of mobile radio telephone

systems.” Ito describes how a service area of the radio telephone system is divided into a plurality of radio zones and a base station is installed in each radio zone. *Id.*, Abstract. As shown in Figure 1 (below), the service area is “divided” into “n radio zones 101 through 10n and base stations 11₁ through 11_n are installed in respective zones. Each radio zone has a radius of about 5 km, for example.” *Id.*, 3:25-32. The radio zones’ base stations are controlled by a control unit 12. *Id.*, 3:32-34.



80. U.S. Patent No. 5,208,756 to Song (Ex-1033), similarly described how in “a typical cellular telephone network, a geographic area is divided into a number of small neighboring cells, each containing a base station, i.e., a small radio tower with a service radius of 1-30 miles.” Ex-1033, 2:61-64.

81. Therefore it was well known to subdivide a geographical area into

smaller radio coverage areas/cells.

B. Tracking and Tracking Devices

1. Tracking Systems Generally

82. Tracking devices generally determine their position periodically, and report that position to a central monitoring facility. A typical application includes asset tracking, where valuable items such as heavy equipment, cargo containers, etc., can be monitored so their owners know where they are. Tracking devices may also be used to monitor the operation of a fleet of vehicles (e.g., delivery trucks, taxis, etc.), so that the fleet operator can determine how effectively operations are proceeding. In some applications, tracking devices are used to determine when a tracked item (equipment, asset, person, etc.) has moved into or out of a restricted area. This approach, often called “Geofencing” typically issues an alert to some party when the geofence is violated. Examples may include warning parents when their teen drivers have left a constrained geographic area, or warning law enforcement when a criminal or enjoined individual has entered into a prohibited area.

83. These tracking systems all generally operate using some form of location determination (typically GPS), coupled with communications. Each tracking device in the system may periodically determine its position and report that position to a central monitoring or tracking facility. That tracking facility may be configured to automatically perform some action, based on the received positions.

For example, the tracking facility may use the received positions to provide regular updates to a user (for example in fleet management operations) or perform some sort of alert action if the received positions indicate the tracking device has crossed a pre-determined boundary. These systems can also operate on a demand basis, where the position is not reported until a request for determining the position is received. So, for example, a truck fleet operator may only need to know the position of a given truck (or the entire fleet) when it needs to dispatch a load. Accordingly, rather than expending the communications cost to regularly determine and report the positions of every vehicle, the system only reports positions when requested.

2. Offender & Victim Tracking Systems

a. Offender Tracking

84. Use of electronic tracking devices to monitor offender locations has been around at least since the 1970's, when a New Mexico judge, Jack Love, came up with the idea of attaching an electronic transmitter to an offender's leg, and placing a receiver in the offender's home, thereby enabling electronic monitoring of the offender's entrance and exit of his/her residence. Ex-1034, 0004.

85. Such "house arrest systems" were widely used in the 1980's. Ex-1034, 0005. However, these systems did not allow for monitoring the offender while outside his/her monitored residence during those times he/she was allowed to leave, such as when he/she was permitted to leave for work, or to attend therapy. *Id.*

86. This led to the development of systems capable of continuously monitoring the offender (including when located outdoors, indoors, and in motor vehicles). *Id.* The development of such systems began in the 1990's. *Id.*, 0011. Early implementations included Pro Tech Monitoring's SMART System, which enabled "monitoring an offender's location 24 hours every day." *Id.*

87. Such wide area continuous monitoring systems typically rely on GPS for determining the offender's position, together with an existing cellular communication system, over which the offender's position may be transmitted to a central monitoring location. *See, e.g., id.*, 0005-0008; Ex-1007, Abstract ("The portable tracking apparatus has a Global Position System receiver ... for determining location."); Ex-1012, 2:49-52 ("The security beacon, the beacon, contains a Global Positioning System (GPS) receiver. This receiver determines its own location from information it receives from satellites."). The offender's position may be provided to the central monitoring location periodically, at set reporting intervals, or in response to a query (or polling message) sent from the central location:

The database would **poll offenders' locator units** by sending them data packets, each of which would contain a unique offender ID. The locator unit would read these packets and pick those that matched its ID. The polling technique is not only an efficient means of using high-bandwidth radio frequency it would also make it possible to communicate with different offenders at different rates because not all offenders need the same level of monitoring. Furthermore, the system could increase the polling rate dynamically if an offender were to violate the monitoring directives.

Ex-1034, 0010;⁸

A database system connected to a wireless system causes a polling message to be sent periodically to each of the subject's locator devices within the range of the wireless system. Each locator device includes a wireless transceiver to receive the polling message and, in response, queries a positioning system for the location of the subject. **The location is then sent back through the wireless system to the database system.**

Ex-1035, 1:56-64;

The offender's portable tracking device 12 transmits location, health and status to the central data base system 22 using connectionless oriented wireless analog or digital message route 32 transitioning to terrestrial communication routes 28, 48, 52 **at intervals** defined by the supervising agency 30 and communicated 56 to the central data base system 22 where they are uploaded to the offender's portable tracking device 12.

Ex-1038, 6:30-37.

88. When the offender is located outside of his/her home, his/her position is regularly compared against “the areas open to the person and the zones off limits.” Ex-1034, 0008. Examples of off-limit areas (also referred to as prohibited areas or exclusion zones) may include bars, schools, parks, and a victim's home and workplace. *Id.*

89. Early support for the development of such offender tracking systems was provided by the National Institute of Justice. Ex-1039, 0002. The National Institute of Justice (“NIJ”) is a component of the Office of Justice Programs, and

⁸ Emphasis added throughout, unless otherwise stated.

functions as “the research and development agency of the U.S. Department of Justice.” Ex-1040, 0002. Among other mandates, Congress has directed the NIJ to “[s]ponsor special projects and research and development programs that will improve and strengthen the criminal justice system and reduce or prevent crime,” and “[d]evelop new technologies to fight crime and improve criminal justice.” *Id.* In a report to the NIJ titled “Offender Wide Area Continuous Electronic Monitoring Systems: Project Summary,” National Institute of Justice, report NCJ 187102 (2000), authors J. Hoshen and G. Drake summarized the activities the NIJ performed in the 1990s related to offender tracking:

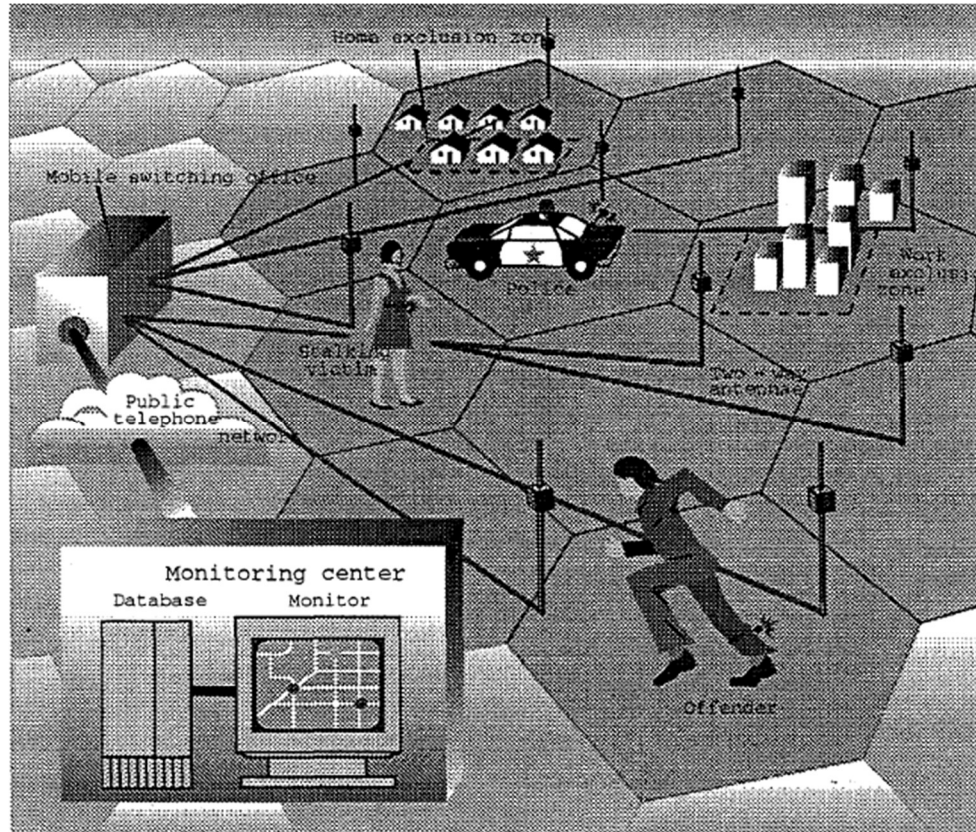
In 1994, the National Institute of Justice (NIJ) took a pioneering step when it provided the Westinghouse corporation with a grant to explore second-generation electronic offender monitoring systems. In 1996, Sandia National Laboratories submitted, at the request of the NIJ, a five year plan to develop such prototype systems in six locations across the U.S.A. Around the same time AT&T presented an informal proposal to the NIJ to form a *consortium* that would build these prototype systems.

Ex-1039, 0002.

b. Tracking Offenders Relative to Their Victims

90. Early developers of offender tracking systems (including those receiving NIJ support), recognized that such systems could be used not only to monitor offenders’ compliance with parole and/or probation requirements, but also to address another issue the NIJ was actively focused on—stalking. Ex-1039, 0001-0002. In particular, by tracking both the location of the offender and the locations of

the victims of that offender, the tracking system “could detect and alert the victim and law enforcement of a stalking event in progress.” *Id.*, 0002; *see also* Ex-1034, 0007. This scenario is illustrated in Figure 2 of J. Hoshen et al.’s article *Wide Area Continuous Offender Monitoring*, which is reproduced below:



Ex-1034, 0007.

91. In such victim-offender monitoring systems, when the offender is located too close to the victim, the monitoring system may be configured to notify the victim, law enforcement, or both:

In the case of stalkers, the location defined in the database could also be a zone from which the offender is excluded. Boundary deviations are considered a violation that could trigger an immediate law

enforcement reaction, if desired. Law enforcement could choose to have an automatic reaction by having the database application call the police unit that is nearest to the offender. This monitoring system will be designed to track a variety of offenders, and help law enforcement intercept and prosecute such offenders. Under this feature, the database tracks the stalker, the prey, and, if desired, mobile police units through the locator units provided to them. **The system alerts both the quarry and the police if the stalker either moves too close to the potential victim or commits a zone violation.** Furthermore, the system could identify the mobile police units that are closest to the person stalked and automatically dispatch them to protect the possible victim and intercept the stalker.

Ex-1034, 0010;

A comparison may then be made between the position of the stalker 24 and victim 28 to determine if stalker 24 is closer than permitted. If so, a law enforcement agent may be located and informed, as above. Additionally, **the victim may be alerted by database processor 18 establishing a data and/or voice connection through mobile telephone switching office 14 and cell site 3 to locator device 22 and informing victim 28 with an audible/visual or other signal that stalker 24 is nearby.** In this manner, a house arrest prisoner, such as 24, may be actively monitored and **law enforcement agents, such as 26, may be informed immediately of a violation** so that meaningful house arrest boundaries may be established. Additionally, stalkers and their potential victims can be monitored for proximity and action taken whenever the stalker moves within a predetermined distance of the intended victim.

Ex-1035, 4:38-53. These notifications typically include the offender's current location. For instance, Taylor teaches advising a restrictor person (e.g., a victim) of the position of a restrictee person (e.g., an offender) relative to the restrictor:

When the restrictee person enters within the perimeter [around the restrictor person] a notification is given of such violation. This notification can be to an oversight authority, to the applicable restrictor person, or to both. When notification is given to the restrictor person

communication therewith may be by any of the methods conventionally known in the art. Preferably, such notification would be received by the restrictor portable monitoring device which would then inform the restrictor person. It is also possible that human personnel at the central location would establish cellular communication with the restrictor person and **advise the restrictor person of the position of the restrictee person relative to the restrictor person.**

Ex-1011, 20:16-29.

92. Additionally, by recording the locations of the offender when in violation of the victim's buffer zone, such systems may be used to generate evidence for use in a subsequent legal proceeding against the offender. *See, e.g.*, Ex-1011, 20:9-12. For instance, U.S. Patent No. 6,160,481 ("Taylor") explains that a computer program may be used to store the positions of the victim (referred to in Taylor as the "restrictor") only when the offender (referred to in Taylor as the "restrictor") is located nearby, in order to protect the privacy of the restrictor, while nevertheless retaining evidence for later use in a legal proceeding:

The computer program could be designed such that the position references of the restrictor person are not stored. This protects the privacy of the restrictor person which has not surrendered any of their rights. Alternatively, it is possible to store the applicable position references of the restrictor person only when the restrictee person is with[in] a predetermined distance measurement of the restrictee person, as exemplified by the perimeter previously described. **This allows for the retention of such records for use during a subsequent legal proceeding.** Such a program could be designed which retains the position references for a specific period of time, adding new position and purging the oldest position references. Then, when a violation occurs all existing location references within the system could be stored. Storage would continue until a predetermined time following

cessation of the violation. This arrangement allows for the preservation of the restrictor person's position references for a predetermined period of time prior to the violation, the entire period of time during the violation and for a predetermined period of time following the violation. The restrictee person's position references can similarly be stored, or all such data may be stored within the locational tracking database.

Ex-1011, 20:35-57.

93. Such victim-offender tracking systems enabled the tracking of multiple offenders with respect to multiple victims. Taylor, for example, teaches a victim-offender tracking system in which an offender may be associated with multiple victims, and/or a victim may be associated with multiple offenders:

It is possible to provide for monitoring a pair of persons to monitor the behavior of a first person, a restrictee person, relative to a second person, a restrictor person. There exist several possible combinations within the general concept of dual tracking. It is possible to have a clear pairing where there exists one restrictee person and one restrictor person. **It is possible to have a single restrictee person monitored relative to a plurality of restrictor persons. It is possible to have multiple restrictee persons monitored relative to a single restrictor person.**

Ex-1011, 19:62-20:4.

94. Many offender-victim tracking systems recognized the potential for false alarms, and built in appropriate tests to protect against false-alarm scenarios. As detailed below, these often included a requirement that, prior to alerting the victim and/or authorities to the presence of a nearby offender, the system wait a prescribed time period to ensure that the violation was ongoing, thereby protecting

against false alarms generated by the tracking equipment itself, or by the offender, who inadvertently and temporarily enters an area in which the victim happens to be located.

95. As an example, U.S. Patent No. 5,497,149 (“Fast”), issued March 5, 1996, teaches a tracking system for use in enforcing restraining orders relating to maintaining a set distance between a “threatened person” and a “threatening person.” Ex-1012, 7:50-8:7. In Fast’s system, each person is assigned a tracking device in the form of a “beacon.” As Fast explains, in response to first detecting a violation, a warning is issued enabling an offender to remediate an inadvertent violation without the system alerting the authorities to the violation:

Each beacon would be programmed to “phone” the other beacon at alternating intervals and request its position. If the positions of the two beacons were found to be too close together, **a warning message would be sent** to each wearer indicating that a potential violation had occurred. If greater separation distance was not provided **within a predetermined time limit**, both beacons would be triggered into emergency mode allowing the supervising authority to track one or both the parties.

Ex-1012, 7:65-8:7.

96. As another example, U.S. Patent No. 5,266,944 (“Carroll”), which issued November 30, 1993, discloses an offender-victim tracking system in which a device located with the victim is configured to receive an ID signal transmitted by the offender’s device, when the offender’s device is nearby. Ex-1041, 14:3-30. In

Carroll's system, "an appropriate test is [] performed" to verify that the receipt of a valid ID signal was not simply a false alarm. In particular:

If the receipt of a valid ID signal is confirmed (block 92), then an **appropriate test is next performed** to positively verify that a valid ID signal was actually received. Typically, this is done, as shown in FIG. 5, by waiting to receive a valid ID signal a second time (block 96). If the abuser is near the RMD, a second valid ID signal should be transmitted within the next 30-120 seconds. Thus, a time window is started after receipt of the first valid ID signal, and **if a valid ID signal is not received before the time window times out (block 98), e.g., within 3-4 minutes, then a false alert is logged** (block 100).

Ex-1041, 21:64-22:8. Thus, Carroll explains that the "receipt of a valid ID signal *over a prescribed period of time* provides sufficient evidence to establish probable cause that [a] protective order has or is being violated." Ex-1041, 14:3-6.

97. As another example, U.S. Patent No. 6,405,213 ("Layson'213"), filed June 11, 1999, teaches the use of a "loiter time" for identifying violations, because "passing through an exclusion zone is permitted but loitering is not (i.e., pedophile driving by a school on the way to work)." Ex-1008, 23:31-36. International Patent Pub. No. WO 96/20464 to Green, published July 4, 1996, similarly teaches a tracking system for monitoring "the whereabouts of a paroled convict," and explains, for example, that "a Judicial Judge may specify that a paedophile not be found within so many feet of a specific child or children under a certain age, although an encounter between a particular [monitored individual] and child; whilst meeting briefly in passing, will not be enough to red-flag the situation." Ex-1042, 20:13-21. Rather,

only “[a]n extended time period of close-proximity (time allowances being kept within reason) will give cause to investigate for the possibility of infractions.” *Id.*

98. In the context of house arrest, U.S. Patent No. 6,072,396 to Gaukel, filed April 24, 1997, similarly teaches an offender tracking system in which, in response to detecting a violation, “the individual might be provided a certain limited time to correct the violation prior to action being taken.” Ex-1043, 16:2-7 (describing this limited time as a “grace period”).

c. Addressing the Crime of Stalking

99. As mentioned above, around the same time the NIJ was funding and researching offender tracking systems, the DOJ (and, in particular, the NIJ) was actively involved in projects to address stalking, an issue that had gained heightened public awareness in the 1980s and 1990s, as a result of “[m]ovies on stalkers, news reports on celebrity stalkers, [and] horrific stories of stalking behavior in the context of intimate relationships.” Ex-1044, 0002; *see also* Ex-1040, 0019 (“As a criminal justice problem, ‘stalking’ captured widespread public attention in the wake of the 1989 murder of actress Rebecca Shaeffer and reports of a fan’s persistent harassment of comedian David Letterman.”). For instance, in 1993, “Congress charged the U.S. attorney general, through the NIJ, to develop and distribute among the states a ‘constitutional and enforceable’ model anti-stalking code,” which the NIJ published in October, 1993. Ex-1040, 0005. The NIJ was also involved in preparing and

publishing the annual reports on stalking and domestic violence that were mandated by the Violence Against Women Act, of the Violent Crime Control and Law Enforcement Act of 1994. *See, e.g.*, Ex-1045.

100. Stalking was also a major concern for state governments in the 1990s, with all of the States enacting anti-stalking legislation during that decade. Ex-1046, 0011. In particular, California enacted the first anti-stalking legislation in 1990, twenty-nine other states followed suit in 1992, and eighteen additional states and the District of Columbia passed anti-stalking legislation in 1993. Ex-1040, 0026.

101. While stalking may be characterized by a variety of different behaviors, one of the most common reported behaviors is following of the victim by the stalker. *See, e.g.*, Ex-1055, 0001 (describing stalking as involving following and maintaining surveillance of a victim). Indeed, in a 1998 article, Rebecca K. Lee included “following the target for a prolonged distance” within her “comprehensive definition of stalking.” Ex-1037, 0011. And, in a survey conducted between November 1995 and May 1996, approximately 75% of stalking victims reported that they had been “spied on or *followed*” by their stalker. Ex-1047, 0002. This is reflected in the various anti-stalking codes, which “typically define stalking as willful, malicious, and repeated *following* and harassing of another person,” and thus “seek to restrict a stalker’s movements by disallowing following or presence in the vicinity of the victim.” Ex-1040, 0025, 0027. Illinois’s anti-stalking statute, for example, defines

stalking as “knowingly and without lawful justification ... follow[ing] another person,” where such following “means (i) to move in relative proximity to a person as that person moves from place to place.” Ex-1010, 0009-0010.

102. While the introduction of anti-stalking legislation created protections for victims, who were no longer required to rely on their stalkers’ commission of other crimes—such as trespass or assault—before pressing charges, the limits on those protections were well-known. Ex-1048, 0009. For instance, while a victim who files charges against a stalker may get temporary relief from that stalker’s harassment, “the stalker is invariably released until the court case, often resulting in an even greater threat being posed to the victim due to anger from the stalker.” *Id.*

3. Vehicle Dispatch Systems

103. Another common application of tracking devices is in vehicle dispatch systems. As noted in a 2000 paper by Soumia Ichoua, Michel Gendreau, and Jean-Yves Potvin, with the rapid growth in communicational and information technologies (like GPS and cell phones), the ability to use real-time information was used to enhance the “performance of decisions systems in the area of vehicle routing.” Ex-1036, 0001. Dynamic vehicle routing and dispatching began in the late seventies but began to receive increased attention in the early eighties based on the emerging information technology and the need for decision systems that could exploit the information to better represent the real world. *Id.*, 0002. The paper notes

the industry concern with systems operating with static information and how dispatchers had to handle new service requests, unexpected delays, and accidents. *Id.*, 0001, 0003. Therefore POSITAs aimed to design dispatch and routing systems to adapt to new requests in real time while minimizing costs routes to satisfy transportation requests. *Id.*, 0001.

104. One example of a dynamic vehicle monitoring and matching system that receives a request from a customer and readily matches an available vehicle to respond to the user-entered demand is U.S. Patent Application Publication No. 2002/0034292 A1 to Tuoriniemi (Ex-1024). Tuoriniemi explains an invention relating to computer programs on portable telephone handsets that allows a host server to match user-interested demand and user-entered supply based on user-given parameters and geographical location derived by GPS or manually entered by the user. Ex-1024 ¶2. Specifically, Tuoriniemi's host server calculates matching items in a geographical search area and sends the matches to a client computer which are then shown as a list or on a map of a cellular telephone handset. *Id.* For example, the user uses a personal computer to connect to the host server and enters the location information when requesting a taxi, which the host server then translates to map coordinates. *Id.* ¶38.

When search is made the host server looks for matches for demand or supply within the demand and supply search area 46 and delivers the search results to the client computer(s) 2. If no matches, e.g. a taxi, are

found within the search area 46 a, user can extend the search area to 46 b and make a new search. By extending the search area user increases his/her possibilities to find a supply source.

Ex-1024 ¶39.

After the host server 6 has matched demand and supply, it delivers supply's location, supply parameters, e.g. woman-35, additional information and the contact means to the demand clients when supply client is within a demand client's search area. Host server also delivers demand client's location, demand parameters, additional information and the contact means to the demand clients if the demand client is within a supply clients search area.

Output results are shown on a list in a desired manner, e.g. listing results depending on the distance from the user. Alternatively results are pinpointed on a map. Map is provided by a client computer, Internet or the host server. Map is also scalable to show a search area or distance to a desired result, show driving directions to a result, or scalable to focus to a certain part on a search area. Several companies MapQuest Inc. among them provide scalable maps where a location can be pinpointed.

Ex-1024 ¶¶47-48.

105. In addition to the user inputting their location (Ex-1024 ¶42), the user may input information about their request such as parameters requesting a taxi and the user's telephone number. *Id.* ¶¶ 42-44, 52. Tuoriniemi further describes that a user defines the search area, such as 10 miles around the user's current location. Ex-1024 ¶¶52-53. Similarly, U.S. Patent No. 6,968,179 to De Vries explains that the user can set rules or parameters as to what is to be considered proximate to the user for purposes of responding to a user's search, such as the user setting a "proximity parameter... [in] the form of a geographic distance threshold, e.g., a radius in miles

or kilometers, within which the people or resources must be located to be considered in proximity to the user.” Ex-1025, 9:1-8; *see also id.*, 16:67-17:7. U.S. Patent No. 5,904,727 to Prabhakaran is another example. Prabhakaran features a “vehicle locate function” that “allows the user to query which vehicles are located around a given location.” Ex-1026, 12:45-56. The user can also select the “proximity” it desires to search by selecting the area on a map. *Id.*, 13:37-47; *see also id.*, 13:51-52 (“Examples of use of this feature include estimating the distance or time for a vehicle to reach a destination”). Therefore it was well known to allow the user submitting a request for a vehicle to specify the search region.

106. The most common way to track the vehicles within a fleet management system is to use transceivers in the vehicles to communicate their locations to a dispatch center. It was common for vehicles to report their location using a portable mobile unit installed in the vehicle. For example, Song (filed in 1991 and issued in 1993) describes a vehicle locating and navigating system operating in conjunction with a cellular network so that a “small, hidden device located the vehicle is activated through DTMF signals (i.e., “touch tones”) transmitted from any telephone station” in order to calculate the distance between the vehicle and each of the base stations. Ex-1033, Abstract. Song’s device includes means for determining the location of each base station from which each signal is transmitted, the transmitting power at which each signal is transmitted, and the signal-attenuation factor of each signal. Ex-

1033, 3:43-46. The device in the vehicle further includes means for calculating the distance between the vehicle and each of the base stations and a means for calculating the location of the vehicle as a function of these distances and the location of each of the base stations. *Id.*, 4:1-19. The device then transmits a signal identifying the vehicle's location in latitude and longitude back to the caller or to a separate station. *Id.*, 4:19-22, 4:29-33. The central station also receives the locational information where the position of the vehicle is displayed on a computer screen along with a graphical representation of a map of the region served by the cellular telephone network so that an operator at the central station can assist the vehicle's operator with navigational information or provide tracking coordinates to a tracking vehicle equipped with a similar device. *Id.*, Abstract.

107. Similarly, Prabhakaran explains methods for graphically tracking the location and status of mobile transmitter units which enhances efficiency. Ex-1026, 1:30-34, 2:46-50. Prabhakaran explains that:

In the fleet management business, knowledge of the status and location of a fleet of vehicles, carrying mobile transmitter units, is a powerful tool for a fleet manager and fleet drivers. By quickly being able to determine the location of the fleet, the fleet manager is able to make informed and efficient time critical decisions, and fleet drivers are able to efficiently determine their position.

Various navigational systems, including the LORAN system, the Global Positioning System (GPS), and others, have been used to determine the locations of vehicles in the fleet, typically in terms of longitude and latitude. *By installing mobile navigational systems and*

mobile transmitter units into such vehicles, fleet drivers are able to determine their position within a geographic area and the fleet manager is able to receive updated positions of fleet vehicles.

Id., 1:34-49.

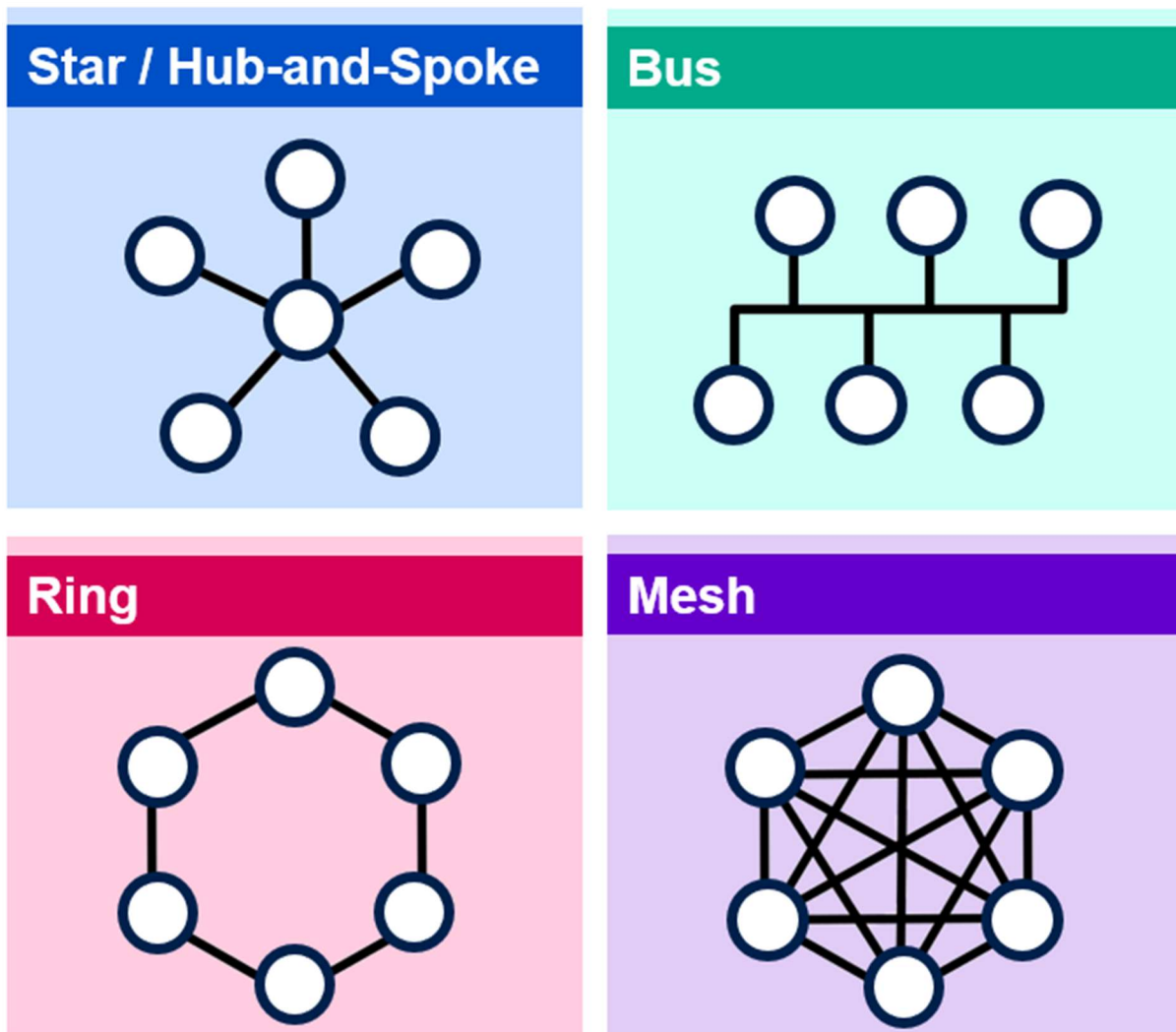
108. Prabhakaran's transmitters can be installed in a mobile vehicle (like a car or golf cart) but can also be used as "pager-sized transmitters" to allow schools and parents to graphically track their children within the neighborhood. Ex-1024, 18:46-19:4.

109. This type of system became even more advanced once cellular devices included GPS receivers for determining the location of the device. For example, Tendler discloses a phone that has an integrally carried GPS antenna and receiver in order to report the GPS location when the user places an emergency call to 911. Ex-1022, 4:59-64, 5:9-15. Tendler explains that this "is especially important in *portable* cellular-based emergency locations systems." *Id.*, 2:55-65. Similarly, Obradovich teaches a "Personal Communications Device" (PCD) that is a "cellular-phone-sized electronic device" that combines the capabilities of a "GPS receiver, transceiver, digital beeper, cell phone and projection system into one compact unit." Ex-1023, 2:60-63. The PCD can display messages but also send and receive latitude and longitude data. *Id.*, 4:15-21.

110. Therefore it was well known to use portable tracking devices in vehicle dispatch or fleet management systems.

C. Network Topologies

111. The elements of a communications network can be arranged in a variety of different ways. For instance, the below diagrams illustrate four different network topologies—a bus network, a hub-and-spoke (or star) network, a ring network, and a mesh network. Each diagram illustrates the communication devices as nodes, and the connections between communication devices as links (or lines) between the nodes.



112. A hub-and-spoke network topology (also known as a star topology) is a hierarchical network topology, in which a central node (referred to as the “hub”) controls the communications within the network. In particular, the central hub manages all communications traffic within the network, by receiving communications from the “spoke” nodes, transmitting communications to the spoke nodes, and/or relaying communications transmitted between spoke nodes. As explained in David D. Clark, et al., *An Introduction to Local Area Networks*, Proceedings of the IEEE, Vol. 66, No. 11 (Nov. 1978):

A star network ... eliminates the need for each network node to make routing decisions by **localizing all message routing in one central node**. This leads to a particularly simple structure for each of the other network nodes. This topology is an obvious choice if the normal pattern of communication in the network conforms to its physical topology, with **a number of secondary nodes communicating with one primary node**.

Ex-1049, 0004; *see also* Ex-1050, 0026 (describing the “hub-and-spoke” topology).

113. In contrast to the hub-and-spoke topology, the bus, ring, and mesh network topologies do not rely on a central control node. In a bus network topology, all of the devices are directly connected to a bus, which is used to broadcast communications to every node over the bus. The destination node reads the broadcasted message, while the other nodes simply ignore it. Ex-1049, 0005. In a ring network topology, every device is directly connected to two other devices,

forming a continuous circle. “[T]he sending node simply transmits its message to the next node in the ring, and the message passes around the ring, one node at a time, until it reaches the node for which it is intended.” Ex-1049, 0005. A mesh network topology is another type of non-hierarchical network topology, in which each device is directly connected to all of the other devices. Ex-1050, 0030.

D. Database Systems

114. Databases have been around for millennia, because, for thousands of years, people have needed to keep track of various types of transactions (accounting), lists of assets (estates), lists of people (census), etc. A well-known example of a simple database is the common telephone book. A telephone book is a table of records, one record for each person (or entity that has a telephone number) listed in the phone book. The records are structured as a set of fields, each field representing some attribute of the record. Ex-1051, 0031. For example most phone books are organized by last name, so the first field of the record is the last name of the person. The next field is usually the first name, followed by the street address, and then the telephone number. An example of such a table is illustrated below:

Last Name	First Name	Address	Telephone Number
Aaaa	Jane	111 Road, City, State	111-111-1111
Aaaa	John	222 Blvd, City, State	123-123-2222
Abab	Jill	333 Street, City, State	323-111-5555
...	...	...	...

To simplify looking up people's phone numbers, the telephone book records are typically sorted so that the records form an alphabetized list. For example all people with last names beginning with A are listed first, those whose last names begin with Aa are at the top of this section of the list, and those with last names beginning with Az are at the end of the "a" section. Using this scheme a person can easily locate the last name of the person who's number they are seeking. Then, since many people may have the same last name, the person may look at the first name field, which is also sorted in alphabetical form. Once the person finds those people with the target last and first name, they can then look at the address to locate the specific person they are seeking, and from that obtain the telephone number from the phone number field.

115. Modern computerized databases use a similar structure, but with the computer performing the search. The well-known relational database was invented by Edgar Codd, in the 1970's. A relational database stores data in tables, as described above, except various fields in the database table may be linked to other records. So, using the phone book example above, the record might also include the profession of the person. This simplifies searching the database because it does not need to be completely re-sorted for each type of data query (the search of the database for some desired information). Thus, if one was searching for a plumber and did not know the names of any plumbers, they could enter the database at the "plumbers" table, and

be presented with a list of plumber records, each containing the name, address, and phone number of all of the plumbers in the phone book. This re-sorted relational structure is what most people will recognize as the “yellow pages,” which is a listing of phone numbers by business type, instead of last name.

116. Indeed, as explained by the book, “Fundamentals of Database Systems,” a database system typically supports multiple “views” of the stored data:

A database typically has many users, each of whom may require a different perspective or view of the database. A view may be a subset of the database or it may contain virtual data that is derived from the database files but is not explicitly stored. Some users may not need to be aware of whether the data they refer to is stored or derived.

Ex-1052, 0035.

117. A database user may retrieve data stored within the database through the use of a database query. Structured Query Language (SQL), which was introduced in the 1970s, is commonly used to invoke such queries. For instance, an SQL SELECT query may be used to retrieve a given column from a database table, or a given row from a table. In this manner, the SELECT command may be used to extract lists of data stored within a database.

IX. THE CHALLENGED PATENT

118. The '918 Patent discloses a communication system consisting of portable mobile units (PRUs) capable of determining and providing their location to a network, and describes two embodiments for the disclosed system, each having a

different application. The first embodiment (the “Proximity Alert Embodiment”) relates to determining if one or more PRUs are in proximity of another PRU, and have maintained that proximity for some period of time while in motion. The second embodiment, (the “Geographic Boundary Embodiment”) relates to specifying a geographic boundary and requesting the location of PRUs within that boundary. While the challenged claims are all directed to the Proximity Alert Embodiment, for completeness, I describe both embodiments below.

A. Proximity Alert Embodiment

119. Claims 1-2, 15, and 22 of the '918 Patent are directed to a “tracking mode” embodiment. Ex-1001, 5:37-42. When in tracking mode, the system is used to determine if a user carrying a mobile unit is being tracked by any of the other mobile units:

In the system, a communication source may query for the location of communication targets at a specified geographic boundary. The communication source may also enter into a **tracking mode to determine if another communication unit is tracking it.**

Ex-1001, 3:38-42;

In tracking mode, a tracked PRU, FIG. 1, 501, may simply **alert a user in possession of the tracked PRU with the location information of any tracking device**—PRU 501—that has resided within a pre-specified radius of the tracked PRU, with both units having traveled a minimum distance.

Ex-1001, 5:37-42.

120. As the user’s mobile unit is moving, either that unit itself, or a control

station (on behalf of the unit), requests that other mobile units in proximity to the user's unit disclose their location:

As the tracked unit 501 is moving, **that unit or an appropriate network unit**, may page for the location of other communication units within the tracking boundary of the tracked unit to disclose their location.

Ex-1001, 5:59-63;

As previously indicated, a PRU may invoke this method directly to determine if other units residing in its immediate geographic area have been tracking it. This would help reduce network overload and, at the end of the tracking period, a status signal may simply be forwarded to the network. In circumstances where a tracked PRU cannot perform this operation, **a ground control unit may be employed to carry out the tracking operation for the PRU and report any findings to the PRU.**

Ex-1001, 6:48-56.

121. In one example, a list is maintained of the mobile units that disclosed their locations, and “[a]t the end of the tracking period, if there are any units in the tracking list and [a] minimum tracking distance was covered, such communication units are deemed to be tracking [the user] and are reported to the [user].” Ex-1001, 6:8-11.

B. Geometric Boundary Embodiment

122. The '918 Patent describes a system consisting of PRUs scattered through a geographic area. Ex-1001, 4:25-26. A user initiates “a page from their PRU for the closest available PRUs that could be found in a geographic jurisdiction.” *Id.*, 7:40-51. The page is then sent by the network to all of the units in a specified

boundary so that the units to disclose their location. The specified geographic boundary information is defined by the latitude and longitude and 'radii information.'" *Id.*, 7:59-61; *see also id.*, 10:24-26.

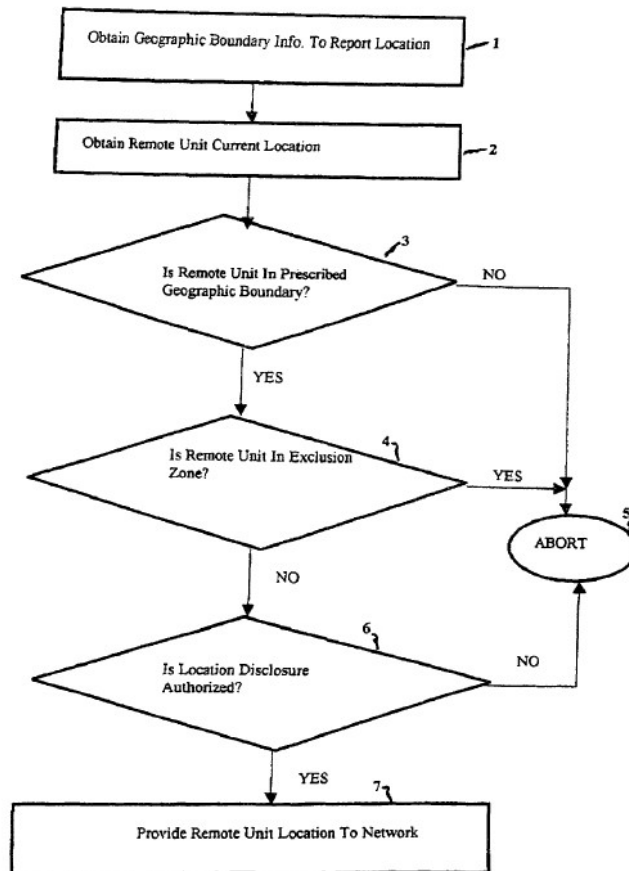


FIG. 6

123. As shown in Figure 6, when the PRU receives a page to disclose its location within a specified geographic boundary, the PRU obtains its location and determines if it is within that boundary. Ex-1001, 10:26-31. If the PRU is within the boundary, its location is provided to the network. *Id.*, 10:34-36; *see also id.*, 9:4-6.

X. PATENT PROSECUTION HISTORY

124. The '918 Patent's file history is Ex-1005. The application leading to the '918 Patent was filed on July 19, 2002, as a continuation-in-part of App. No. 09/753,178, filed on Dec. 30, 2000 and issuing as the '752 Patent. Ex-1001, Cover. The examiner issued a non-final rejection on July 15, 2003, rejecting challenged Claims 1-2, 15, and 22 under the nonstatutory double patenting doctrine over claims of the '752 Patent. Ex-1005, 0240-0247. The applicant submitted amendments on October 15, 2003 and December 23, 2003, together with a terminal disclaimer (Ex-1005, 0112, 0191-0215), and the examiner issued a notice of allowance on April 16, 2004. Ex-1005, 0228. The '918 Patent issued on June 29, 2004.

XI. SUMMARY OF OPINIONS

125. I have been asked to consider the patentability of some claims of the '918 Patent in view of certain prior art references. As explained in detail below, it is my opinion that:

- **Ground 1:** Claim 15 is rendered obvious by U.S. Patent No. 5,731,757 ("Layson'757," Ex-1007) in view of U.S. Patent No. 6,405,213 ("Layson'213," Ex-1008);
- **Ground 2:** Claims 1 and 22 are rendered obvious by Layson'757 in view of Layson'213 in further view of 720 Ill. Comp. Stat. Ann. 5/12-7.3, as amended by 1995 Ill. Legis. Serv. P.A. 89-377 (H.B. 1792), eff. Aug. 18, 1995 ("IllinoisLaw,"

Ex-1010);

- **Ground 3:** Claim 2 is rendered obvious by Layson’757 in view of Layson’213 and IllinoisLaw in further view of U.S. Patent No. 5,365,451 (“Wang,” Ex-1009);

- **Ground 4:** Claim 15 is rendered obvious by U.S. Patent No. 6,160,481 (“Taylor,” Ex-1011) in view of U.S. Patent No. 5,497,149 (“Fast,” Ex-1012);

- **Ground 5:** Claims 1, 2, and 22 are rendered obvious by Taylor in view of Fast in further view of IllinoisLaw.

126. The following table is a summary of the above-enumerated grounds:

Ground	Prior Art	Claims
1	Layson’757 and Layson’213	15
2	Layson’757, Layson’213, and IllinoisLaw	1, 22
3	Layson’757, Layson’213, IllinoisLaw, Wang	2
4	Taylor and Fast	15
5	Taylor, Fast, and IllinoisLaw	1, 2, and 22

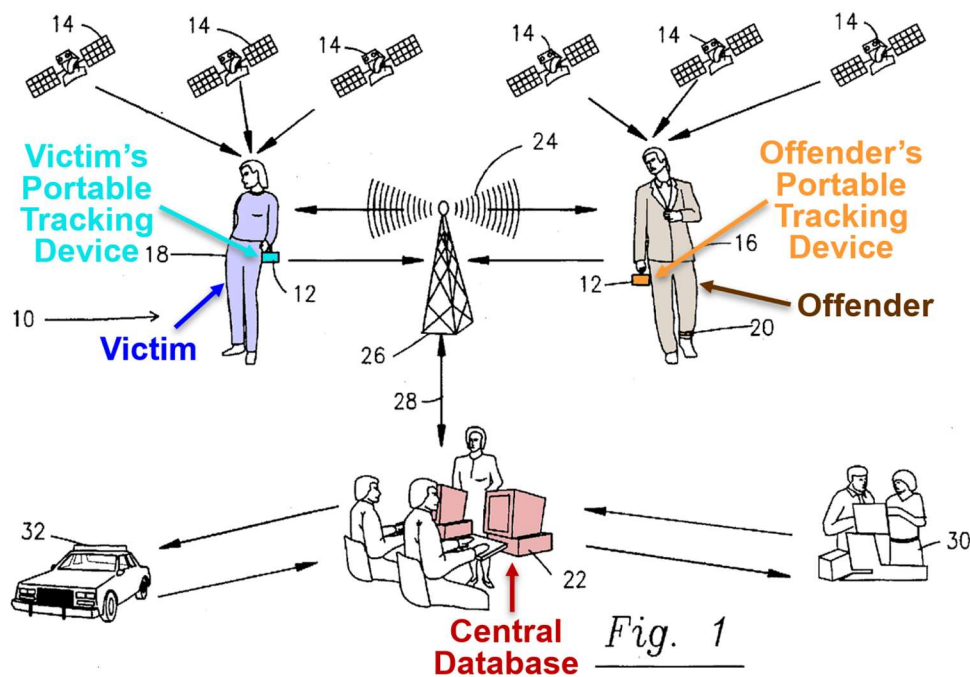
XII. BRIEF DESCRIPTION OF THE APPLIED PRIOR ART REFERENCES

A. Layson’757 (Ex-1007)

127. Layson’757, titled “Portable Tracking Apparatus For Continuous Position Determination of Criminal Offenders and Victims,” is U.S. Patent No. 5,731,757, issued on March 24, 1998. I understand that Layson’757 is prior art under

pre-AIA 35 U.S.C. § 102(b), based on when it issued.

128. Layson'757 teaches dynamic tracking of offenders and victims (referred to within Layson'757 as "subjects"), by assigning a portable tracking device to each subject, as illustrated in annotated Figure 1, below. Ex-1007, 2:46-58.



129. In Layson'757, tracking these subjects is accomplished through the use of "location constraints," which define "buffer zones" around locations meant to exclude a subject. Ex-1007, 8:36-43. As Layson'757 explains, such location constraints "can be static, or in the case of a moving victim, [the] location constraints can be dynamic." Ex-1007, 9:43-45. The location constraints are sent from a central database to the subjects' tracking devices where they are continually processed. Ex-

1007, 9:41-50. Using these location constraints, an offender tracking device is able to determine locally when it has entered within a victim's buffer zone, and notify the central database immediately of such violation. *Id.*, 9:48-50. As Layson'757 explains:

This distributed processing approach off-loads the central data-base system from collecting data in a continuous or real-time mode and allows the central data-base system to perform more temporal tasks such as **data fusion where it analyzes developing situations such as a stalker-victim encounters** and issues the appropriate warnings and instructions to all subjects. This approach also is more cost effective since communication costs are event driven by the portable tracking apparatus rather than continuous or intermittent based solely on scheduling of communication periods.

Ex-1007, 8:50-59.

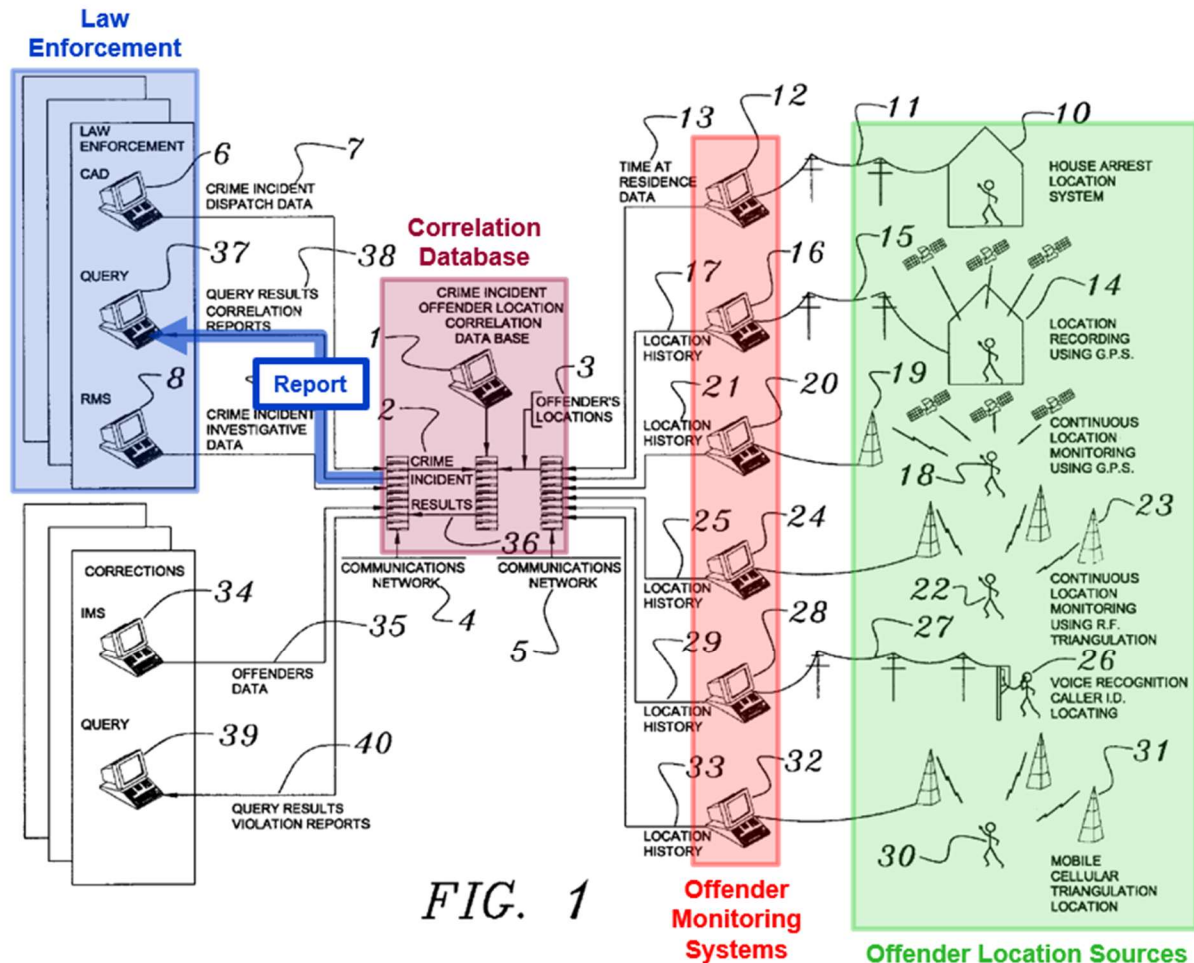
130. In response to receiving a notification of violation, Layson'757's central database may notify law enforcement and/or the victim of the offender's violation. Layson'757 explains that the central database "contains guidelines ... regarding the notification response to corrections, law enforcement and victims based on the nature of the offender's violation." *Id.*, 9:50-54. For instance, the central database may send "warnings to the victim" that an offender is nearby, or issue "alarms to law enforcement or corrections" alerting them to an impending offender-victim encounter. *Id.*, 8:13-19.

B. Layson'213 (Ex-1008)

131. Layson'213, titled "System to Correlate Crime Incidents With a

Subject's Location Using Crime Incident Data and a Subject Location Recording Device," is U.S. Patent No. 6,405,213, filed June 11, 1999, and issued June 11, 2002. I understand that Layson'213 is prior art under pre-AIA 35 U.S.C. § 102(e), based on when it was filed.

132. Layson'213 teaches a "crime incident/offender location correlation system," as illustrated in annotated Figure 1, below. Ex-1008, 8:28-32.



133. Layson'213's system receives offender location data from one or more monitoring systems (Ex-1008, 8:28-32), and analyzes that data to generate reports

for law enforcement (*id.*, 10:12-23). For instance, Layson’213’s system may be used to generate reports of “exclusion zone violations,” corresponding to instances in which an offender is located in a prohibited area. *Id.*, 23:9-38. Layson’213 explains that such exclusion zone violations are reported when the offender remains in the exclusion zone for a “loiter time,” “since passing through an exclusion zone is permitted but loitering is not (i.e., a pedophile driving by a school on the way to work).” *Id.*, 23:33-38.

134. Layson’213’s correlation database is configured to generate reports for law enforcement both automatically and in response to queries:

The law enforcement query terminal 37 receives automated correlation reports and query results 38 using its connection to the communications network 4. Results 36 from the crime incident/offender correlation data base 1 are comprised of **automated correlation of crime incidents to offender locations and structured queries entered by law enforcement personnel**.

Ex-1008, 10:11-17.

135. When performing automated correlations, the system performs “an iterative process that continuously performs correlation” of offender locations (*id.*, 19:41-45) with “crime incident data” received from various law enforcement systems (*id.*, 18:19-23). As Layson’213 explains, this automatic correlation is performed to identify offenders who have violated the conditions of their probation/parole by entering into prohibited areas (“exclusion zones”), as well as to

identify, from the pool of known offenders, potential suspects who may have committed reported crimes:

The automated crime incident/subject location correlation is an iterative process that **continuously performs correlation** as data from CAD 7, RMS 9, IMS 34 and offender location monitoring systems 220 is received by the crime incident offender location correlation data base 1. Each offender's data from an offender location monitoring system 220 is **correlated against any violations of exclusion zone criteria 221** from offender sentencing data in IMS 34 and **exclusion zone violations reported by the offender location monitoring system 220**. If exclusion zone violations are correlated 221 a table report is generated 222 for the law enforcement and/or corrections/community supervision agency(s)....

Each offender's data from an offender location monitoring system 220 is **correlated against any crime incidents 225** from CAD 6 and RMS 8 systems.... For offender locations that were inside the crime incident automated criteria boundaries, **a table report of high probability suspects is generated 229**.

Ex-1008, 19:41-20:1.

136. In addition to performing automatic correlation, Layson'213's system enables law enforcement to perform "structured queries" to "support investigative crime incident/offender location correlation with variable criteria." Ex-1008, 20:30-35. This is desirable, because:

Subsequent investigative data may require **changing one or more of the automated correlation criteria to support a broader investigative query** due to discovery of additional crime incident data not available at the time when the automated correlation report for the crime incident was generated.

Ex-1008, 20:35-40. Layson'213's system thus allows "[l]aw enforcement and

corrections/community supervision agency personnel” to use a “query terminal” to specify criteria to perform a variety of different queries, including:

- (i) “correlat[e] a single crime incident with offender(s) locations” (Ex-1008, 20:44-54, Fig. 10);
- (ii) “correlat[e] multiple crime incidents with offender(s) locations” (*id.*, 21:36-49, Fig. 11);
- (iii) obtain “the locations of a subject during a specified time period” (*id.*, 22:34-43);
- (iv) obtain “exclusion zone violations of a subject during a specified time period” (*id.*, 23:11-21, Fig. 13);
- (v) obtain “a crime incident map that can span multiple law enforcement jurisdictions during a specified time period” (*id.*, 23:66-24:11, Fig. 14);
- (vi) identify “a subject at a specified location during a specified time period” (*id.*, 24:29-37, Fig. 15);
- (vii) obtain “the frequent locations of a subject during a specified time period” (*id.*, 24:59-25:3, Fig. 16);
- (viii) identify “locations where offenders loiter during a specified time period” (*id.*, 25:25-35, Fig. 17); and/or
- (ix) identify “locations where offenders cluster during a specified time period” (*id.*, 25:57-67).

137. For instance, to perform a query to “correlat[e] multiple crime incidents with offender(s) locations” (identified as query (ii) in the list, above), Layson’213 identifies the following criteria:

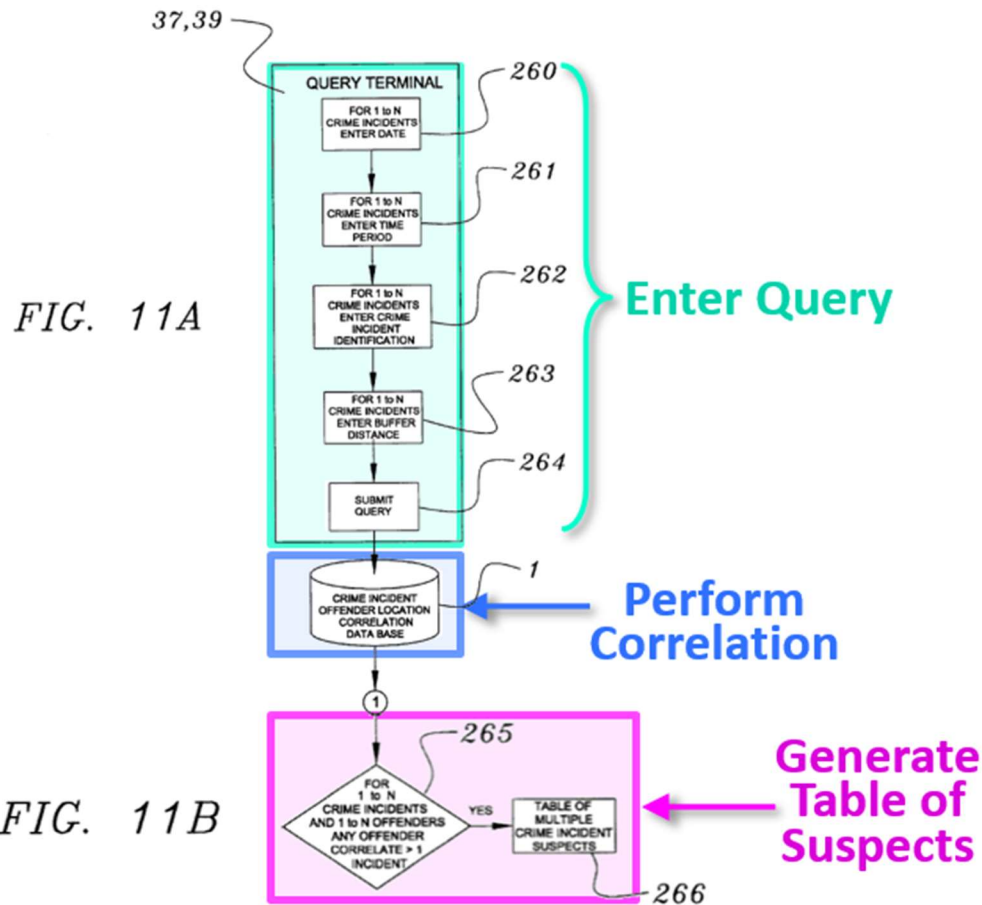
- 1) For each crime incident, a **date** or range of dates (i.e. spanning midnight, time of crime incident could have occurred in a multiple day interval, etc.),
- 2) For each crime incident, a **time period** (i.e. the exact time covers

multiple hours),

3) For each crime incident, a specific crime incident identification and

4) For each crime incident, a **buffer distance** around crime incident location (i.e. increased buffer area due to time period, offender's travel speed, etc.).

Ex-1008, 21:40-49). In response to entering such criteria into Layson'213's query terminal, "[e]ach offender's data from an offender location monitoring system 220 is correlated against the structured multiple crime incident query criteria 265," and "[f]or those offenders that have location data that does match more than one structured crime incident query criteria 265, a table report of multiple crime incident suspect offenders is generated 266," as illustrated in annotated/excerpted Figure 11, below. *Id.*, 21:59-64.



C. Wang (Ex-1009)

138. Wang, titled “Mobile Unit Tracking System,” is U.S. Patent No. 5,365,451, issued November 15, 1994. I understand that Wang is thus prior art under pre-AIA 35 U.S.C. § 102(b), based on when it issued.

139. Wang teaches a tracking system in which mobile units obtain their locations using GPS (Ex-1009, 3:30-33), and communicate those locations to a network (Ex-1009, 3:50-53). In order to conserve “communication resources” and prevent “excessive use” of battery power (Ex-1009, 1:38-52), Wang’s network provides each mobile unit with a “border” (Ex-1009, 3:50-56) that is sized according

to the network's desired location accuracy for the associated mobile unit (Ex-1009, 6:20-24). Examples of these borders (22a, 22b, 22) are illustrated in annotated Figure 1, below.

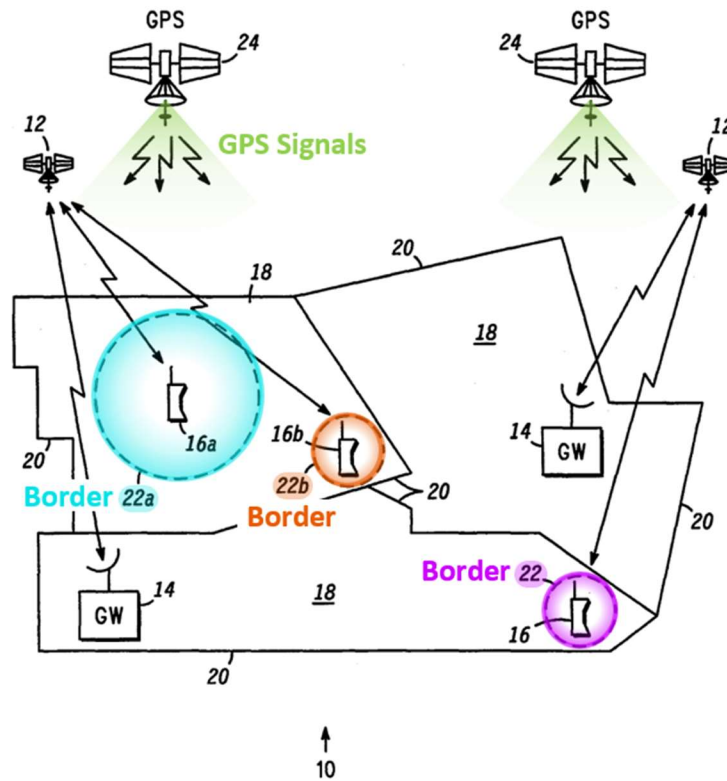


FIG. 1

140. When a mobile unit is located anywhere within its border, it does not need to transmit its location to the network. Ex-1009, 3:56-58 (“So long as the mobile unit 16 operates within the defined border 22, it does not need to inform network 10 of its whereabouts.”). “However, when the mobile unit 16 goes outside the border 22, it sends a new location communication to network 10 and receives a new border definition in response.” Ex-1009, 3:58-61. In this manner, Wang’s

system conserves communication resources:

Thus, the tracking system of **the present invention minimizes the number of communication messages** which are needed for maintaining valid data. Less accurate data are maintained with few location communication messages when less accurate data may be tolerated, as indicated at mobile unit 16a and border 22a. More accurate data are maintained by more location communication messages when more accurate data are required, as indicated at mobile unit 16b and border 22b in FIG. 1.

Ex-1009, 3:62-4:3.

D. IllinoisLaw (Ex-1010)

141. IllinoisLaw, 720 Ill. Comp. Stat. 5/12-7.3, as amended by P.A. 89-377 (H.B. 1792), was passed in the Illinois General Assembly on May 26, 1995, and became effective on August 18, 1995. Ex-1010, 0009-0023. IllinoisLaw was publicly available at least as of September 10, 1996. For example, Public Act 89-337 appears as pages 3920-3938 of the Laws of the State of Illinois, Eighty-Ninth General Assembly (1995), Public Act 89-1 Thru Public Act 89-443, which was received and shelved in the Illinois State Library in Springfield, Illinois, on September 10, 1996, as indicated by the stamp on the front cover of the publication:

ILLINOIS DOCUMENTS
SEP 10 1996
ILLINOIS STATE LIBRARY
LAWS
OF THE
STATE OF ILLINOIS
**EIGHTY-NINTH
GENERAL ASSEMBLY**

1995

**PUBLIC ACT 89-1
THRU
PUBLIC ACT 89-443**



142. I understand that IllinoisLaw is thus prior art under pre-AIA 35 U.S.C.
§ 102(b), based on when it published.

143. IllinoisLaw states that:

“(a) A person commits stalking when he or she, knowingly and without lawful justification, on at least 2 separate occasions **follows another**

person or places the person under surveillance or any combination thereof....”

Ex-1010, 0009. IllinoisLaw further explains that:

(e) For the purpose of this Section, **“follows another person” means (i) to move in relative proximity to a person as that person moves from place to place** or (ii) to remain in relative proximity to a person who is stationary or whose movements are confined to a small area. “Follows another person” does not include a following within the residence of the defendant.

Ex-1010, 0010.

E. Taylor (Ex-1011)

144. Taylor, titled “Monitoring System,” is U.S. Patent No. 6,160,481, filed on January 12, 1999, and issued on December 12, 2000. I understand that Taylor is thus prior art under pre-AIA 35 U.S.C. §102(e), based on its filing date.

145. Taylor teaches a “dual tracking system” for monitoring the position of one or more “restrictor” persons (e.g., a victim) relative to one or more “restrictree” persons (e.g., a stalker against whom the victim has a restraining order). Ex-1011, 19:61-20:12. To this end, each monitored person is assigned a portable tracking device (*id.*, 20:58-62) that communicates the person’s position to a central location (*id.*, 18:62-64). Taylor’s system is designed to notify the restrictor person and/or “an oversight authority” when a restrictree person is located nearby the restrictor. Ex-1011, 20:13-20. This is accomplished through the use of one or more perimeters defined around the restrictor person:

A computer program may be designed which **defines a perimeter around the restrictor person** of the pair of monitored persons which is **updated depending upon the movement of the restrictor person**. When the restrictee person enters within the perimeter a notification is given of such violation. This notification can be to an oversight authority, to the applicable restrictor person, or to both.

Ex-1011, 20:13-20.

It is possible to provide for **several unique perimeters around the restrictor person**. Each unique perimeter would have a predefined distance measurement from the restrictor person. It is also possible to define various distinct notifications of violation of the different unique perimeters.

Ex-1011, 20:30-34.

146. Figures 13a through 13c (reproduced below, with annotations) illustrate the use of these dynamic perimeters:

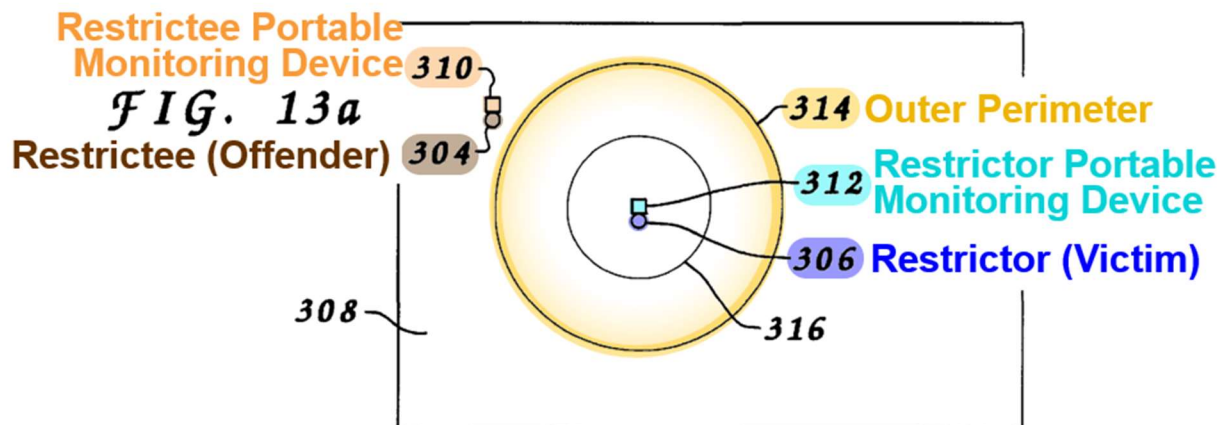
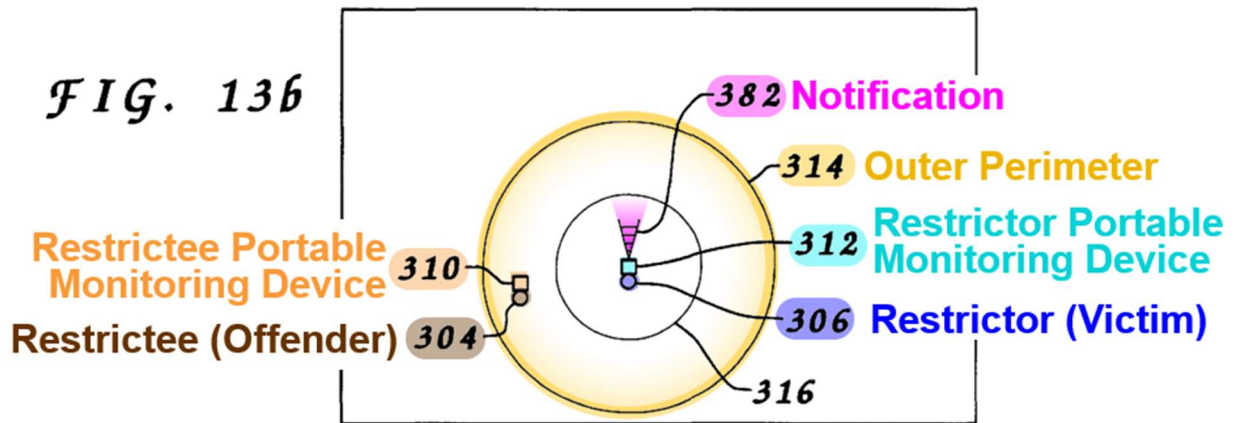
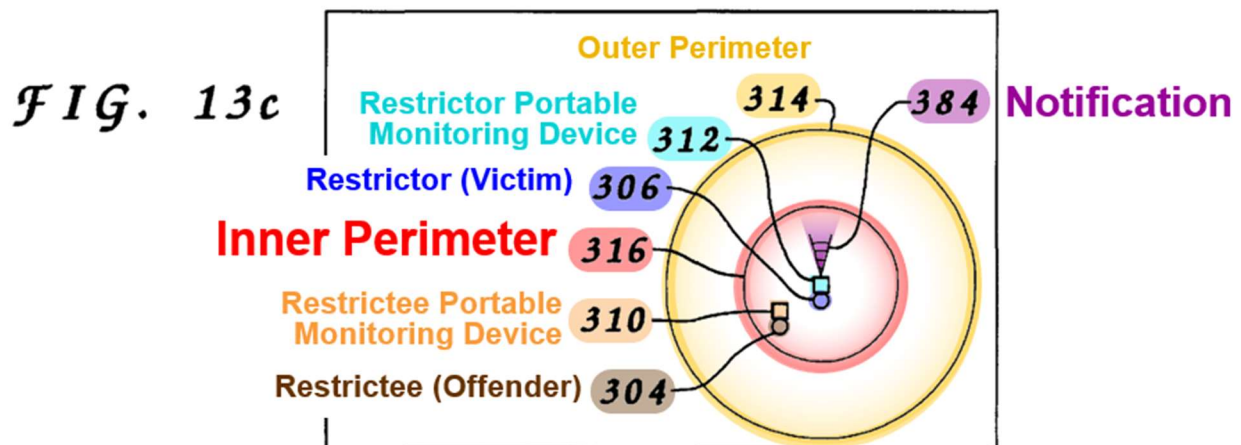


Figure 13a, above, illustrates a pair of perimeters 314 and 316 around restrictor 306, with restrictee 304 located outside of both perimeters. Ex-1011, 20:58-21:4. In response to restrictee 304 entering crossing the outer perimeter 314 surrounding

restrictor 306, a first notification 382 is sent to the restrictor's portable monitoring device 312, as illustrated in annotated Figure 13b, below. *Id.*, 21:4-9.



If restrictee 304 continues his/her approach and crosses inner perimeter 316, a second notification 384 is sent to the restrictor's portable monitoring device 312, as illustrated in annotated Figure 13c, below. *Id.*, 21:9-15.



147. Taylor explains that the notifications are “received by the restrictor portable monitoring device which would then inform the restrictor person.” Ex-

1011, 20:23-25. These notifications may take the form of “human personnel at the central location [] establish[ing] cellular communication with the restrictor person and advis[ing] the restrictor person of the position of the restrictee person relative to the restrictor person.” Ex-1011, 20:25-29.

F. Fast (Ex-1012)

148. Fast, titled “Global Security System,” is U.S. Patent No. 5,497,149, issued on March 5, 1996. I understand that Fast is thus prior art under pre-AIA 35 U.S.C. §102(b), based on its issue date.

149. Fast teaches a system that may be used to enforce a restraining order held by a “threatened person” against a “threatening person.” Ex-1012, 7:50-8:7. This is accomplished by assigning a “beacon” to each person, and maintaining a “terminal for monitoring each beacon” by a “supervising authority.” *Id.*, 7:62-65. Each beacon “includes receivers for signals from any global positioning satellites,” and uses the received signals “to determine the present position of the beacon” either “periodically” or “continuously.” Ex-1012, 13:9-14.

150. Each of Fast’s beacons is programmed to periodically “phone” the other beacon and request its position. *Id.*, 7:62-67. If the beacons are found to be “too close together,” a warning message is first sent “indicating that a potential violation had occurred.” *Id.*, 7:67-8:3. Then, “[i]f greater separation distance [is] not provided within a predetermined time limit,” the supervising authority is alerted, by triggering

both beacons “into emergency mode.” *Id.*, 8:3-7.

XIII. DETAILED EXPLANATION OF THE UNPATENTABILITY GROUNDS

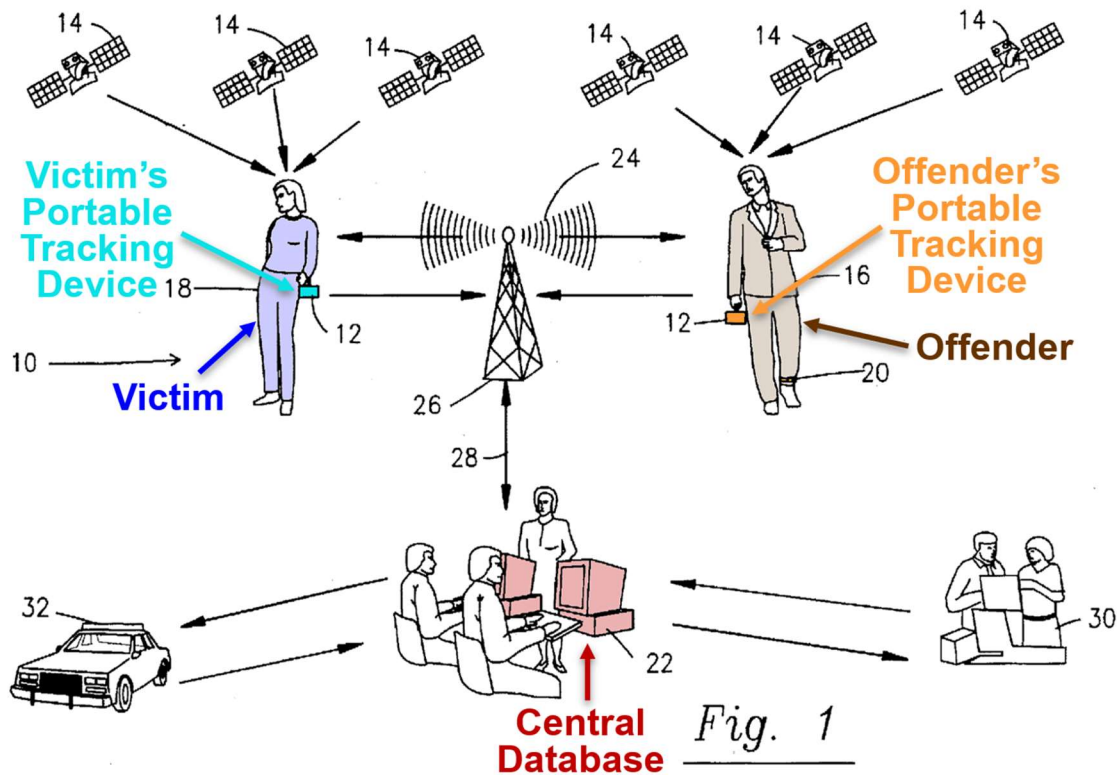
151. The '918 Patent contains 27 claims, of which Claims 1, 4, 9, 15, 22, 26, and 27 are independent. Claims 1, 2, 15, and 22 are challenged in the Petition. As explained below, these challenged claims are disclosed and/or taught by the prior art.

A. Ground 1: Claim 15 is rendered obvious over Layson'757 in view of Layson'213

1. A POSITA would have been motivated to combine Layson'757 with Layson'213 and would have had a reasonable expectation of success

152. Layson'757 discloses “a portable locator or tracking apparatus ... for continuous location determination of subjects.” Ex-1007, Abstract. Specifically, Layson'757 teaches tracking offenders 16 and corresponding victims 18, by assigning a portable tracking device 12 to each, as illustrated in annotated Figure 1, below. Ex-1007, 2:46-49. These devices communicate with other networked devices, such as “central data-base system 22” (Ex-1007, 3:9-12), “to provide advance offender violation warning for victims beyond the confines of the victim’s home.” Ex-1007, 1:13-15; *see also id.*, 8:39-43 (“By including wider buffer zones for locations that are meant to include or exclude a subject, the portable tracking device provides advanced notification to victims far beyond the transmitter range of

the subject's body-worn device.”).



153. Layson'757 focuses on the details of the portable tracking devices 12, and their use in tracking the locations of offenders relative to victims. As Layson'757 explains, each portable tracking device receives, from the central database 22, “schedule rules and location constraints,” against which it compares its location. Ex-1007, 3:9-13, 7:3-5 (same). These “schedule rules and location constraints” identify locations where a subject is permitted and/or prohibited:

The schedule rules are driven by time of day and day of week as to **where a subject's location is allowed or not allowed** and describe the response actions taken by both the portable tracking apparatus and the central data-base system. **The location constraints define locations and a distance radius which constitute a buffer area around a**

location. Location constraints can be static, or in the case of a moving victim, location constraints can be dynamic. The schedule rules and location constraints are sent from the central data-base system to the portable tracking apparatus where they are continuously processed.

Ex-1007, 9:37-48. If the subject's location is in violation of these rules/constraints (e.g., if offender 16 is located within a "buffer area" around victim 18), the device notifies the central database of the violation:

If the current location violates the schedule rules and location constraints of the subject then the subject is notified 148 and the response to the central data-base system is evaluated against the schedule rules and location constraints 150 for the subject.

Ex-1007, 7:9-13;

The schedule rules and location constraints are sent from the central data-base system to the portable tracking apparatus where they are continuously processed. **The portable tracking apparatus notifies the subject and the central data-base system immediately when a violation occurs.** The central data-base system contains guidelines in the schedule rules for each offender regarding the notification response to corrections, law enforcement and victims based on the nature of the offender's violation.

Ex-1007, 9:41-50. Otherwise, the device stores the current location for upload to the central database at the next scheduled time (as part of a batch upload):

If the current location complies with the schedule rules and the location constraints 142 for the subject, then **the location and status data is stored** 144 in the portable tracking apparatus to be transmitted to the central data-base system on the next scheduled communication 146.

Ex-1007, 7:5-10.

154. Layson'757 also teaches that its central database system 22 may be used for "post-time evaluation" of the received location data, such as "build[ing] reports"

and/or responding to “[q]ueries for location history data [] performed by law enforcement”:

This invention relates to electronic monitoring and tracking of persons. More particularly, it relates to collecting and storing locations of an offender or victim subjects for either **real-time or post-time evaluation** and response based on schedule rules and location constraints for the person (subject).

Ex-1007, 1:8-12;

The central data-base system examines the present and past locations of the subject 212 since the previous data transfer. If any of the locations are violations, the central data-base system examines the profile of the subject 213 to determine if any further violation notification is required. An offender’s current position relative to any associated victim’s current position is analyzed by data fusion 215 to determine if any alarms to law enforcement or corrections, commands to the offender and warnings to the victim are required based on the dynamic movements of the offender and victim. **The central data-base system then builds reports 214 based on the data received.**

Ex-1007, 8:9-20;

18. The method according to claim 16 wherein **the central data-base builds reports** on the subject based on signals from the portable tracking apparatus.

Ex-1007, Cl. 18;

Queries for location history data can be performed by law enforcement 32 and parole and probation 30 to identify offenders 16 in the vicinity at the time a crime was committed.

Ex-1007, 3:24-27.

155. Layson’213 describes a “correlation database” that receives offender location data, such as that provided by Layson’757’s tracking system:

FIG. 1 depicts the end-to-end crime incident/offender location correlation system and component subsystems. The crime incident/offender location correlation database 1 is a relational data base that **receives** crime incident data 2 and **offender location data 3** **on a continuous basis**.

Ex-1008, 8:28-32;

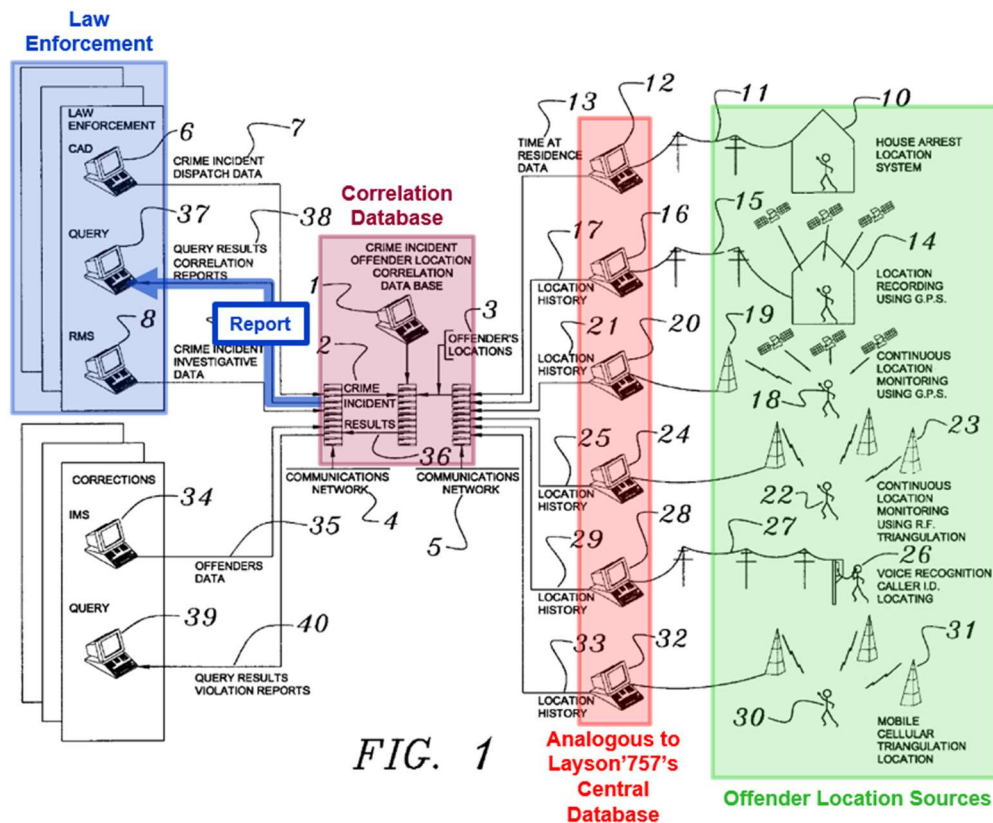
Offender location data 3 is comprised of location data derived from the following sources;

...

3) **Continuous location monitoring 18 of offenders determined by GPS** as known in the art, on a twenty four hour basis

Ex-1008, 8:55-64. Layson '213's system is illustrated below, in annotated Figure

1:



156. Layson'213's correlation database is configured to generate “either

electronic or hardcopy reports” (Ex-1008, 19:40) for “law enforcement and/or corrections/community supervision agency(s),” either automatically, or in response to “structured queries,” as illustrated in annotated Figure 1, above:

The automated crime incident/subject location correlation is an iterative process that continuously performs correlation as data from CAD 7, RMS 9, IMS 34 and offender location monitoring systems 220 is received by the crime incident offender location correlation data base 1. Each offender’s data from an offender location monitoring system 220 is correlated against any violations of exclusion zone criteria 221 from offender sentencing data in IMS 34 and exclusion zone violations reported by the offender location monitoring system 220. **If exclusion zone violations are correlated 221 a table report is generated 222 for the law enforcement and/or corrections/community supervision agency(s).**

Ex-1008, 19:41-52;

FIGS. 10 through 19 are flowcharts of the method of operation for structured queries submitted against the crime incident offender location correlation data base 1. **Structured queries support investigative crime incident/offender location correlation with variable criteria** since automated crime incident/offender location correlation described in FIG. 9 must deal with finite criteria established at the time the automated correlation is generated.

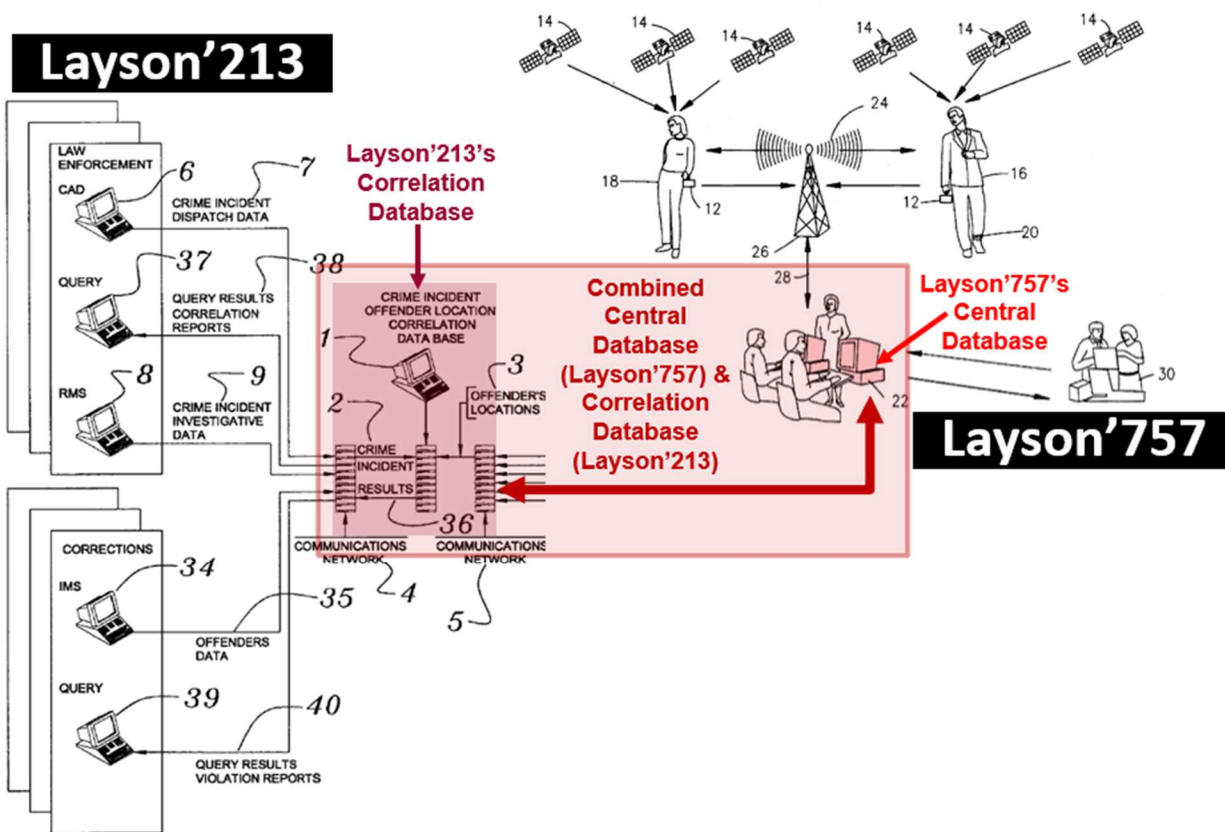
Ex-1008, 20:28-30.

157. Both Layson’757 and Layson’213 relate to the same subject matter of offender tracking, and both list the same inventor—Hoyt M. Layson, Jr. Ex-1007, [75], 1:7-13; Ex-1008, [76], Abstract.

158. A POSITA seeking to implement Layson’757’s system would have been motivated to incorporate the teachings of Layson’213’s complementary system

for implementation details on Layson’757’s system’s capability to “build reports,” including details regarding the type of reports that may be built, as well as the content of those reports. In particular, a POSITA would have been motivated to implement Layson’757’s central database to work with Layson’213’s corresponding teachings of its correlation database, as illustrated below. A POSITA would have recognized that such a combination of familiar elements would have predictable results—namely, Layson’213’s correlation database would build reports using offender location data received from Layson’757’s central database.

159. In the combined system (“Layson’757-Layson’213”), the locations of those subjects carrying portable tracking devices would have been generated and provided by the infrastructure depicted in Layson’757 Figure 1. The reporting and correlating actions would then have been performed on these locations by the infrastructure depicted in Layson’213 Figure 1. This combined system is illustrated below:



160. A POSITA would have had a reasonable expectation of success in implementing the combined Layson'757-Layson'213 system because both Layson'213's correlation database and Layson'757's central database are configured to operate on the same type of offender location data—namely, location data determined by GPS and obtained through continuous location monitoring:

Offender location data 3 is comprised of location data derived from the following sources;

...

3) **Continuous location monitoring 18 of offenders determined by GPS** as known in the art, on a twenty four hour basis.

Ex-1008, 8:55-64;

FIG. 1 illustrates an overall system 10 incorporating a portable tracking

device 12 which receives communication signals from a **global position satellite (GPS) 14 to determine the location of the subject** (offender 16 or victim 18. When **continuous location of the offender is desired**, the offender 16 is fitted with a body-worn device 20 which is non-removable by the offender 16 and provides tamper detection to generate alarms should the offender 16 attempt to remove the body-worn device 20.

Ex-1007, 2:46-54. Indeed, Layson’213 explicitly identifies Layson’757 as providing an approach for “determining the location of a person or subject, such as an offender, ... outside the confines of their respective residence,” and incorporates Layson’757’s disclosure by reference:

Currently, determining the location of a person or subject, such as an offender, is possible outside the confines of their respective residence. This approach can be seen in **U.S. Pat. No. 5,731,757, the disclosure of which is hereby incorporated by reference herein.**

Ex-1008, 2:26-30. Thus, the references themselves teach and suggest this combination.

2. Independent Claim 15

- a. **Element 15[pre]: A method for determining that a first portable remote unit of a wireless consumer associated with a network is being tracked by at least a second portable remote unit that is in motion with the first portable remote unit over a tracking period comprising;**

161. Layson’757-Layson’213 teaches the preamble of Claim 15, to the extent it is determined to be limiting.

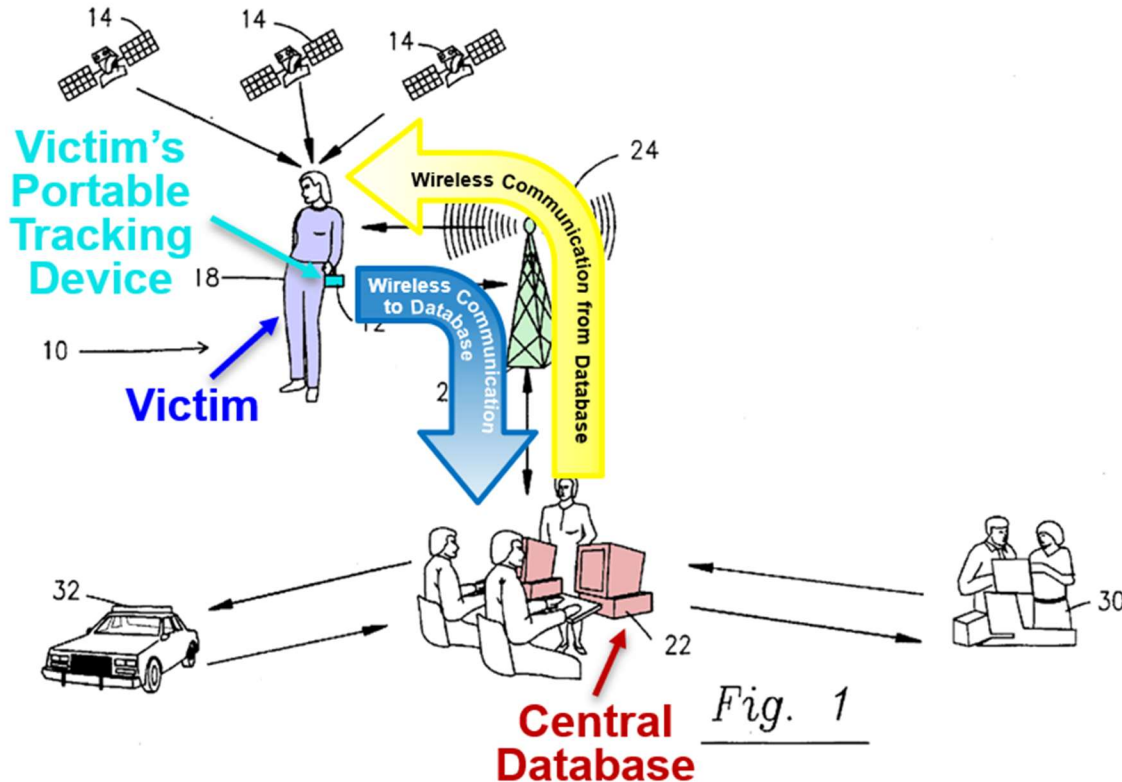
162. **First portable remote unit:** Layson’757’s victim portable tracking

device corresponds to the “first portable remote unit.” Layson’757 teaches a victim, to whom a portable tracking device is assigned:

FIG. 1 illustrates an overall system 10 incorporating **a portable tracking device 12** which receives communication signals from a global position satellite (GPS) 14 to determine the location of the subject (offender 16 or **victim 18**).

Ex-1007, 2:46-49. This victim 18 corresponds to the claimed “wireless consumer” in “a geographic region of a wireless network.”

163. As illustrated in annotated/excerpted Figure 1, below, victim 18’s portable tracking device 12 communicates wirelessly with “central data-base system 22” (Ex-1007, 3:9-12) via “network cell site 26” (Ex-1007, 2:65-3:2).



164. Because the victim’s portable tracking device performs wireless

communications via network cell site 26, when using the device, the victim consumes wireless resources of the wireless communication network to which that network cell site belongs. Accordingly, victim 18 is a “wireless consumer” of that network. This interpretation is consistent with the ’918 Patent specification which describes a wireless consumer as simply a member of the general public that uses the wireless system. *See e.g.*, Ex-1001, 1:59-2:4.

165. The ’918 Patent explains that its portable mobile remote units are capable of wireless communication (Ex-1001, 3:63-67), and are used to provide location information to the network, as the units are carried:

A PRU may be able to assist the network in determining its global location or use any location determination technique to resolve and provide its location to the network. **As a PRU is carried from one location to the other it may obtain and provide information concerning its current location to the network.**

Ex-1001, 5:11-16.

166. Each of Layson’757’s portable tracking devices is similarly configured for wireless communication:

The wireless network cell site 26 processes the wireless signals and switches the communication through the mobile switching office to the public switched telephone network 28 as is known in the prior art.

The communication from the subject’s portable tracking device 12 is routed to the central data-base system 22 where response decisions for notification to parole and probation 30, victims 18 and law enforcement 32 are made based on schedule rules and location constraints provided by the supervising agency such as parole and probation 30.

The central data-base system 22 communicates to the subject's portable tracking device 12 via the wireless communication link 24 or a telephone line when not portable in order to load updated schedule rules and location constraints.

Ex-1007, 2:65-3:13. And, as Layson'757's subjects carry them about, Layson'757's portable tracking devices obtain and transmit information about their current position to the central database:

The portable tracking apparatus is responsive to a wireless system in communication with **a global positioning system (GPS) satellite constellation for determining the spatial coordinates of a subject. These coordinates are conveyed to a central data-base.**

Ex-1007, 1:62-66;

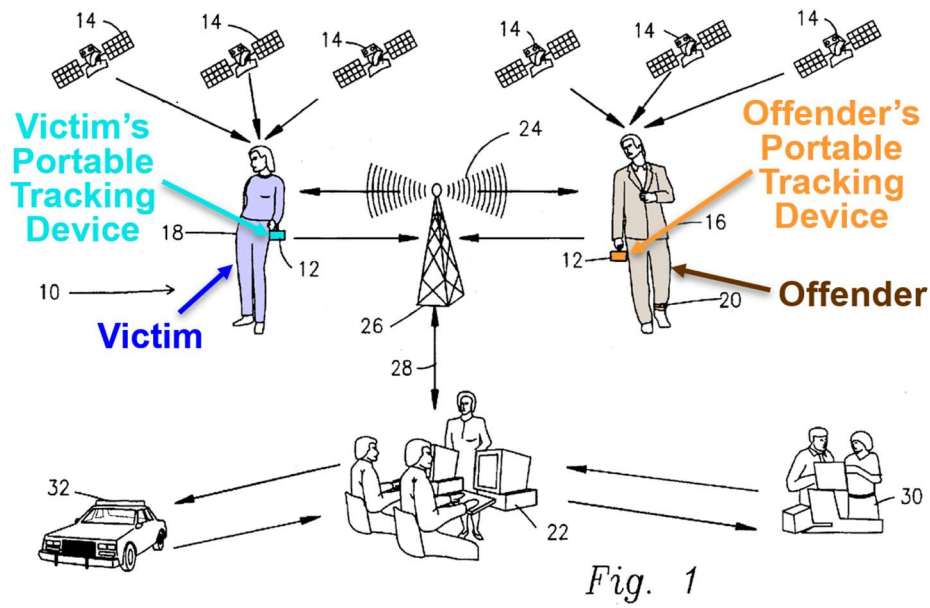
Upon successful data transfer from the portable tracking device, the central data-base system stores the location and status data 208. The central data-base system analyzes **the location** and status data stream **received from the portable tracking device 210** to determine current and past status generated by the portable tracking device since the previous data transfer.

Ex-1007, 7:66-8:5.

167. Accordingly, each of Layson'757's portable tracking devices is a "portable mobile remote unit," at least because it is of the same form as the '918 Patent's portable mobile remote units.

168. **At least a second portable remote unit:** Layson'757 also teaches that offenders 16 have portable tracking devices secured to them, as illustrated in annotated Figure 1, below. *See also* Ex-1007, 2:46-49 ("FIG. 1 illustrates an overall system 10 incorporating a portable tracking device 12 to determine the location

of the subject (*offender 16* or victim 18).”).



Layson'757's offender tracking device corresponds to the claimed "at least a second portable remote unit."

169. **Victim and offender tracking devices are in motion:** Layson'757's portable tracking devices are carried by offenders and their associated victims, enabling the system to "*monitor their movements*" with respect to one another (Ex-1007, 1:46-49), and to provide warnings to the victims and/or alarms to law enforcement "based on the *dynamic movements of the offender and victim.*" (Ex-1007, 8:13-19). This is done through the use of dynamic location constraints, each of which defines "a buffer area" around the location of a moving victim. Ex-1007, 9:40-45. Accordingly, Layson'757's system contemplates that both the victim portable tracking device ("first portable remote unit") and the offender portable

tracking device (“second portable remote unit”) may be in motion.

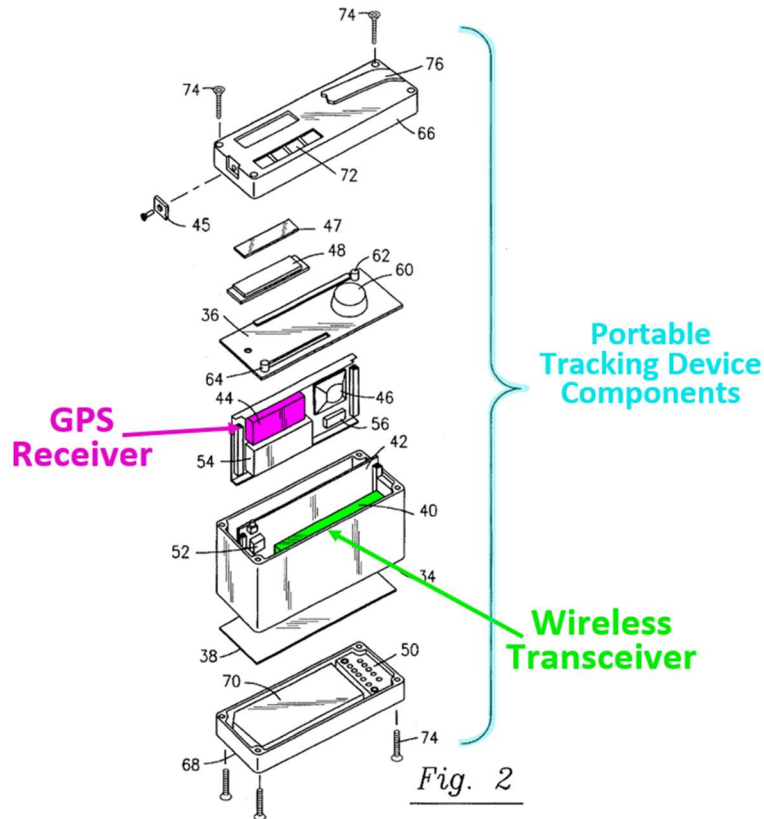
170. As I discuss below for the additional elements of Claim 15, Layson’757-Layson’213 teaches a method by which Layson’757’s central database determines that the victim portable device is being tracked by the offender portable device over a period of time corresponding to a “tracking period,” while the devices are in motion.

b. Element 15[A]: i) obtaining the location information of the first portable mobile remote unit, said location information provided at intervals during said tracking period;

171. Layson’757-Layson’213 teaches Element 15[A] through Layson’757’s disclosure of Layson ’757’s victim portable tracking device obtaining its location and providing that location, at intervals, to the central database.

172. As explained for Element 15[pre], Layson’757’s victim portable tracking device corresponds to the claimed “first portable mobile remote unit.”

173. Layson’757 teaches obtaining the location of the victim portable tracking device as the victim carries it about. As Layson’757 explains, each portable tracking device includes “GPS receiver 44,” as illustrated in Figure 2, below, that “receives communication signals from a global position satellite (GPS) 14 to determine the location of the subject (offender 16 or victim 18).” Ex-1007, 2:46-49.



174. Each of Layson’757’s portable tracking devices provides its location to the network by transmitting that location to the central database system, as illustrated in annotated Figure 1, below, either at “deterministic reporting intervals” (Ex-1007, 7:40-42) or on demand:

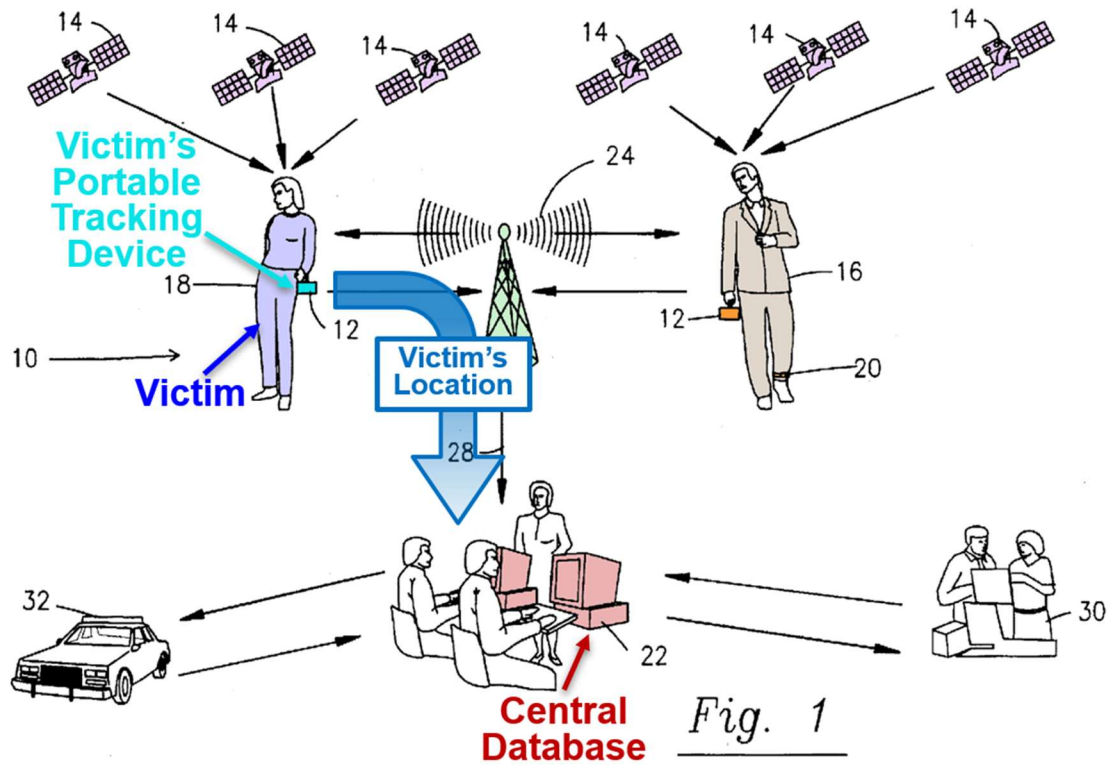
At any time the central data-base system 22 may be commanded by law enforcement 32 or other agencies such as parole and probation 30 to **query the portable tracking device 12 to ascertain the immediate status of the portable tracking device 12 and the location of the offender 16 or victim 18.**

Ex-1007, 3:18-23;

If the current location complies with the schedule rules and location constraints for the subject 142, then the current location and status is stored in the portable tracking device 144. The portable tracking

apparatus checks the next **scheduled time for communications with the central data-base system 146 to upload all location and status data.**

Ex-1007, 7:15-20. These reporting intervals correspond to the claimed “intervals during said tracking period.”



175. Notably, a POSITA would have understood that obtaining a series of locations, each measured at a distinct time (whether those locations are obtained at “deterministic reporting intervals” or on demand), with the sequence covering “said tracking period,” corresponds to obtaining those locations at intervals over the tracking period.

176. As I explain below for Element 15[C], “said tracking period” in the

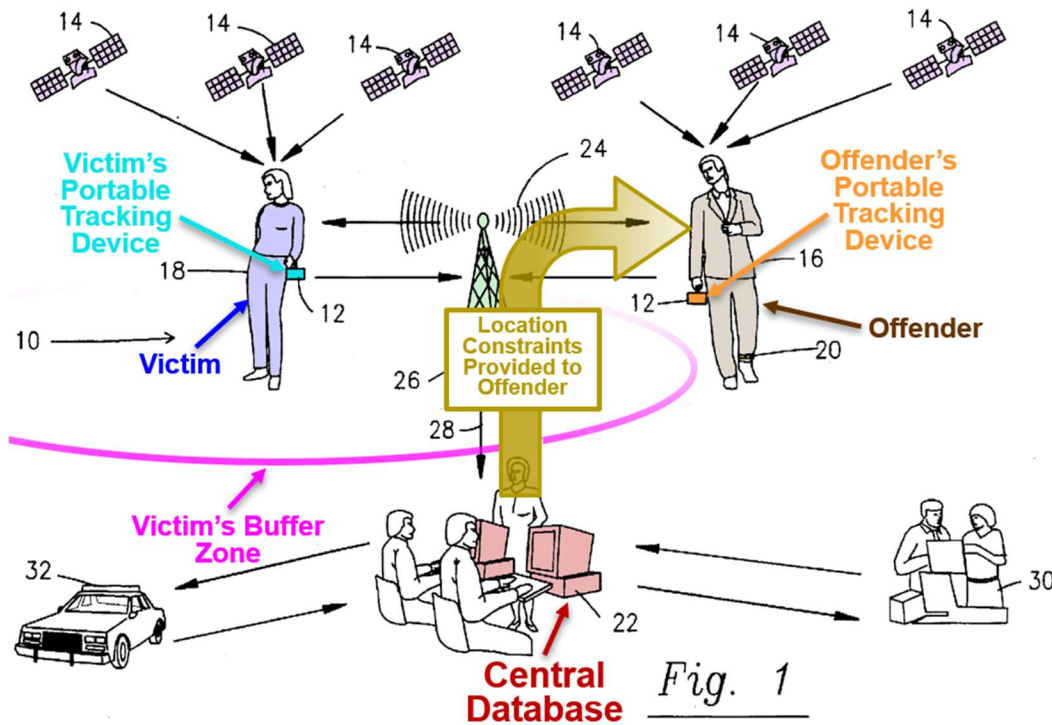
context of Layson’757-Layson’213 would correspond to at least two or more reporting intervals necessary to detect the offender loitering within the buffer zone around the victim as opposed to merely passing through (i.e., “said tracking period” is the “loiter time” for the offender).

- c. **Element 15[B]: ii) obtaining the location information of the at least second portable communication unit that is within a specified geographic boundary of the first portable remote unit, said location information provided at intervals during said tracking period;**

177. Layson’757-Layson’213 teaches Element 15[B].

178. Layson’757’s central database obtains the location information of the offender portable tracking device, which is provided by the offender device, at intervals, when the device is located within the buffer region around the victim portable tracking device.

179. **Specified geographic boundary:** As explained for Element 15[pre], Layson’757’s victim portable tracking device corresponds to the claimed first portable remote unit. Layson’757 teaches defining a geographic boundary around the location of the victim tracking device (“a specified geographic boundary of the first portable remote unit”), as illustrated in annotated Figure 1, below, and providing it to the offender tracking device within the offender’s “location constraints.” Ex-1007, 9:41-48.



The location constraints provided to the offender device identify “locations that are meant to ... exclude a subject [e.g., the offender]”—such as the victim’s current location—together with “buffer zones” around those locations:

This autonomy is accomplished by the central database system contacting the portable tracking device and downloading schedule rules and **location constraints** to the portable tracking device. By including **wider buffer zones for locations that are meant to include or exclude a subject**, the portable tracking device provides advanced notification to victims far beyond the transmitter range of the subject’s body-worn device.

Ex-1007, 8:36-43;

The **location constraints** define locations and a distance radius which **constitute a buffer area around a location**.

Ex-1007, 9:41-43.

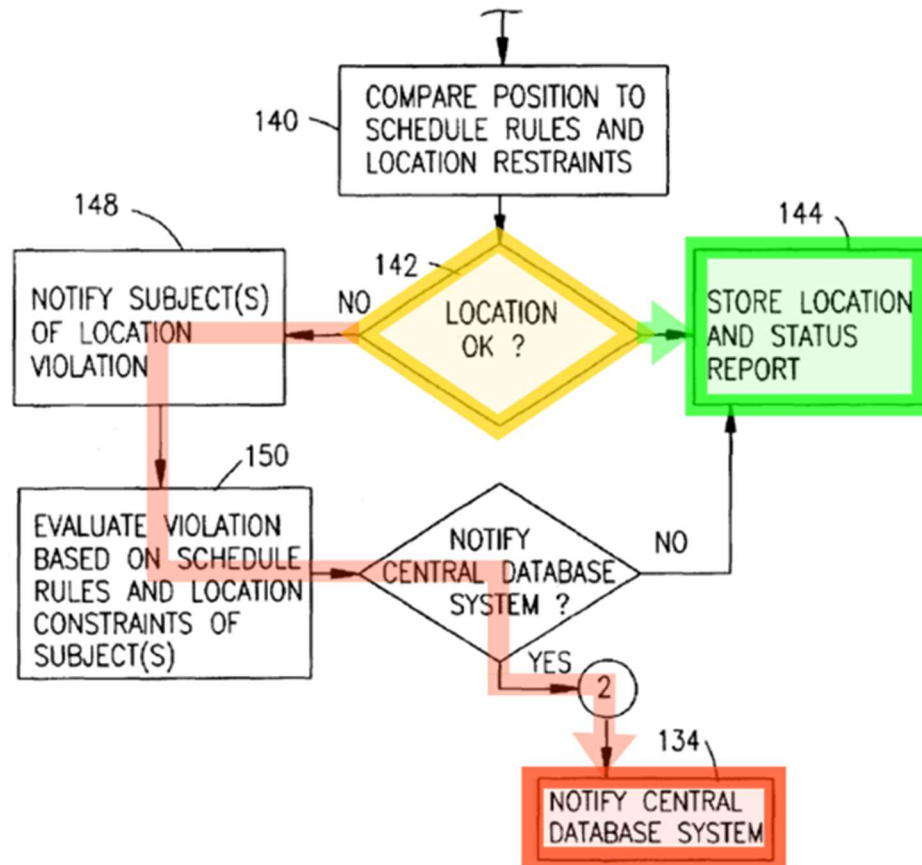
Thus, “in the case of a moving victim. [the] location constraints can be dynamic”—i.e., the buffer zones are updated based on the current location of the victim, as reported to the central database by the victim’s portable tracking device. Ex-1007, 9:42-44.

180. **Obtaining the offender device’s location at intervals when the offender’s device is “within a specified geographic boundary” of the victim’s device:** As explained for Element 15[pre], Layson’757’s offender portable tracking device corresponds to the claimed at least second portable communication unit.

181. Layson’757 teaches that the offender tracking device sends its location to the central database (“obtaining the location information of the at least second portable communication unit”), when the device is located within the buffer zone defined around the victim’s device (“specified geographic boundary of the first portable remote unit”), as determined by the offender device using its location constraints. In particular, at each time interval, in response to receiving the victim’s location, the central location sends updated location constraints (defining a buffer zone around that current location) to the offender device. Ex-1007, 8:36-39 (“[T]he central data-base system ... download[s] schedule rules and location constraints to the portable tracking device.”). The offender device “continuously processe[s]” these dynamically-updated location constraints (Ex-1007, 9:42-44), enabling the offender device to notify the central database “immediately when a violation

occurs”—i.e., immediately when the offender device enters within the buffer zone around the victim device. Ex-1007, 9:45-50. To accurately identify when the offender device is located within the victim’s buffer zone, the central database would provide updated location constraints to the offender device each time it received an updated location from the victim’s portable tracking device (“at each interval”). Doing so would achieve Layson’757’s goal of enabling “real-time event processing....,” by helping to ensure that the location constraints used locally by the offender device reflect up-to-date (e.g., real-time) information. Ex-1007, 1:38-61.

182. Notifying the central database that the offender’s device is located within the victim’s buffer zone would have entailed the offender’s portable tracking device providing its current location to the central database, for potential inclusion in a “notification response to corrections, law enforcement and victims” (Ex-1007, 9:50-54). This can be seen with reference to Figures 6A and 6B of Layson’757, reproduced in an annotated/excerpted form, below.



At steps 140-142, the portable tracking device compares its location to the location constraints received from the central database, which include a buffer zone around the victim's current location. If the offender device *is not* within the buffer zone around the victim, then, at step 144, it stores its location and status for later batch transmission to the central database. Ex-1007, 7:3-10. On the other hand, if the offender device *is* within the buffer zone around the victim (steps 148-150), then it immediately notifies the central database (step 134).⁹ Ex-1007, 7:10-13. Notably, in

⁹ While Figure 6B includes an additional decision following step 150, in which an offender device in violation of a location constraint determines whether or not to

such a scenario, the device does not store its location and status locally. A POSITA would thus have understood that, in notifying the central database in step 134, the offender device would be reporting its location and status information to the central database. *See also* Ex-1007, 3:57-62 (explaining that the portable tracking devices report “violation data” in a “data message” sent to the central database). Additional disclosure in Layson’757 further confirms that, in response to determining that it is located within the buffer zone around a victim, the offender portable monitoring device sends its location to the central database as part of notifying the central database of this buffer zone violation. In particular, Layson’757 explains that, if “wireless or land line communications [are] not [] available” when the portable tracking device determines that it is in violation of its location constraints, the device “log[s] all events and locations” (Ex-1007, 8:29-36), enabling it to provide those

“notify central database system” of the violation, a POSITA would have understood that the offender’s “schedule rules” would indicate that the device should always notify the central database when the offender device enters within the buffer zone around a victim. In particular, Layson’757 explains that, by enabling the portable tracking devices to perform local processing, the approach “off-loads the central data-base system from collecting data in a continuous or real-time mode and allows the central data-base system to perform more temporal tasks such as data fusion where it analyzes developing situations such as a stalker-victim encounters and issues the appropriate warnings and instructions to all subjects.” Ex-1007, 8:50-56. Because a key goal of Layson’757’s system was to provide available processing capacity at the central database so that it could analyze a developing stalker-victim encounter, a POSITA would have understood that the central database should be notified immediately when a potential stalker-victim encounter is detected (based on the stalker’s presence within the victim’s buffer zone).

events and locations to the central database when communications are re-established. Accordingly, when communication channels are available, the offender device would send its location to the central database as part of an event notification (e.g., notification of entry within the victim's buffer zone).

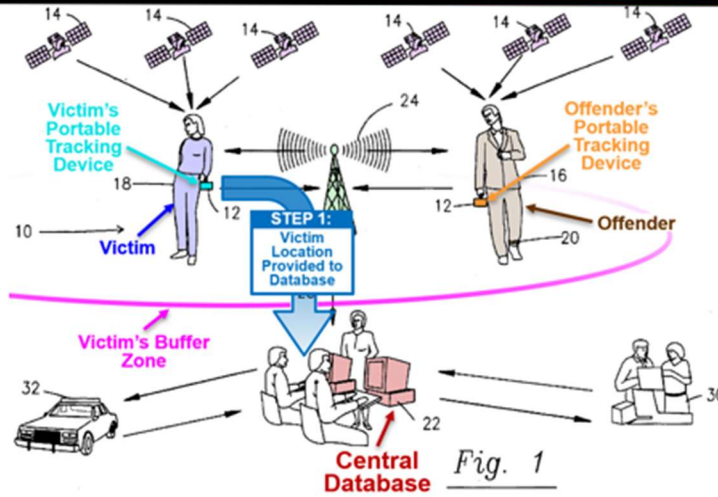
183. Furthermore, a POSITA would have understood that the central database would need the offender device's location in order for the central database to include it in a potential notification response to law enforcement and/or the offender's victim. As explained for Element 15[D] below, in the combined Layson'757-Layson'213 system, the central database may notify the victim and/or law enforcement, in response to determining that the offender device has remained within the victim's buffer region for a "tracking period." A POSITA would have understood that such a notification to the victim and/or law enforcement would have included the offender's location, in order to enable law enforcement to respond to the violation and to aid the victim in evading the approaching offender. Indeed, as I explain in the Background section, it was well-known in prior art offender-victim tracking systems to provide a nearby offender's location to a victim. For example, Taylor teaches an offender-victim tracking system in which, in response to determining that the offender had entered within a perimeter defined around the victim, "human personnel at [a] central location would establish cellular communication with the [victim] and advise the [victim] of the position of the

[offender] relative to the [victim].” Ex-1011, 20:16-29.

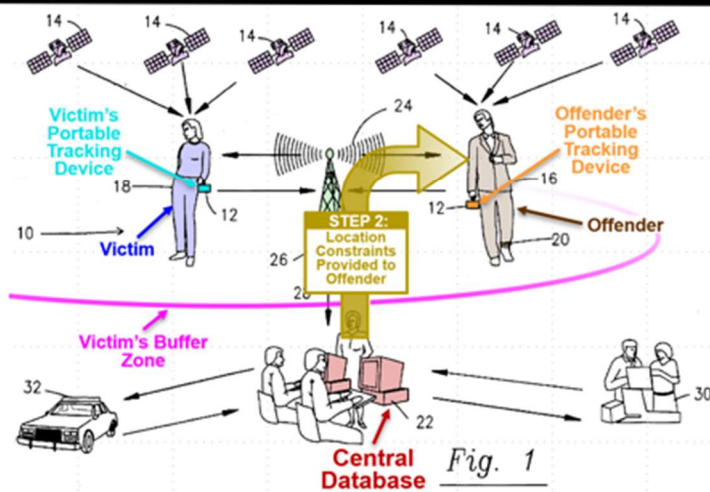
184. Thus, the central database’s transmission of the buffer zone location constraints to the offender device results in the offender device providing its location to the central database if it is within the victim’s buffer zone (“specified geographic boundary of the first portable remote unit”). In particular, as explained above, Layson’757’s offender portable tracking device “continuously processe[s]” these dynamically-updated location constraints and provides immediate notifications when the offender tracking device (portable mobile remote unit) enters within the “buffer zone” around the victim’s portable device (“within a specified geographic boundary”). Ex-1007, Cl. 16 (“[T]he portable tracking device receiv[es] communications from the central data-base to download ***updated schedule rules and location constraints*** on the subject.”), 9:45-50 (“The portable tracking apparatus ***notifies*** the subject and ***the central data-base system immediately when a violation occurs.***”). This process is illustrated below, using annotated versions of Figure 1:

Offender Inside Victim's Buffer Zone

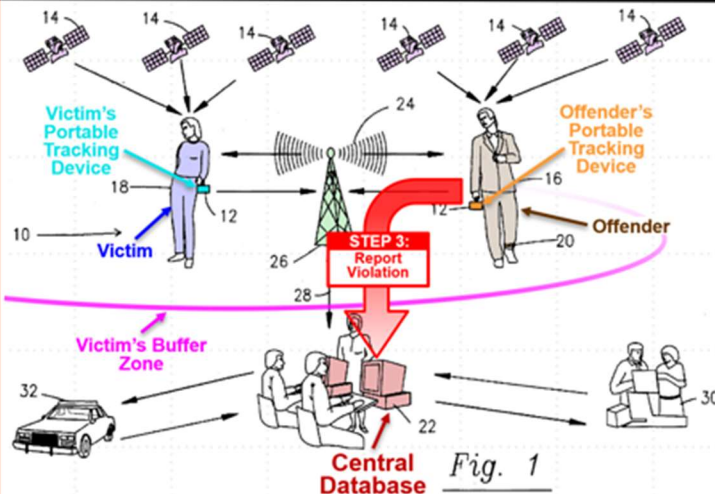
STEP 1: Victim Location
Provided to Database



STEP 2: Location Constraints
Provided to Offender



STEP 3: Report Violation

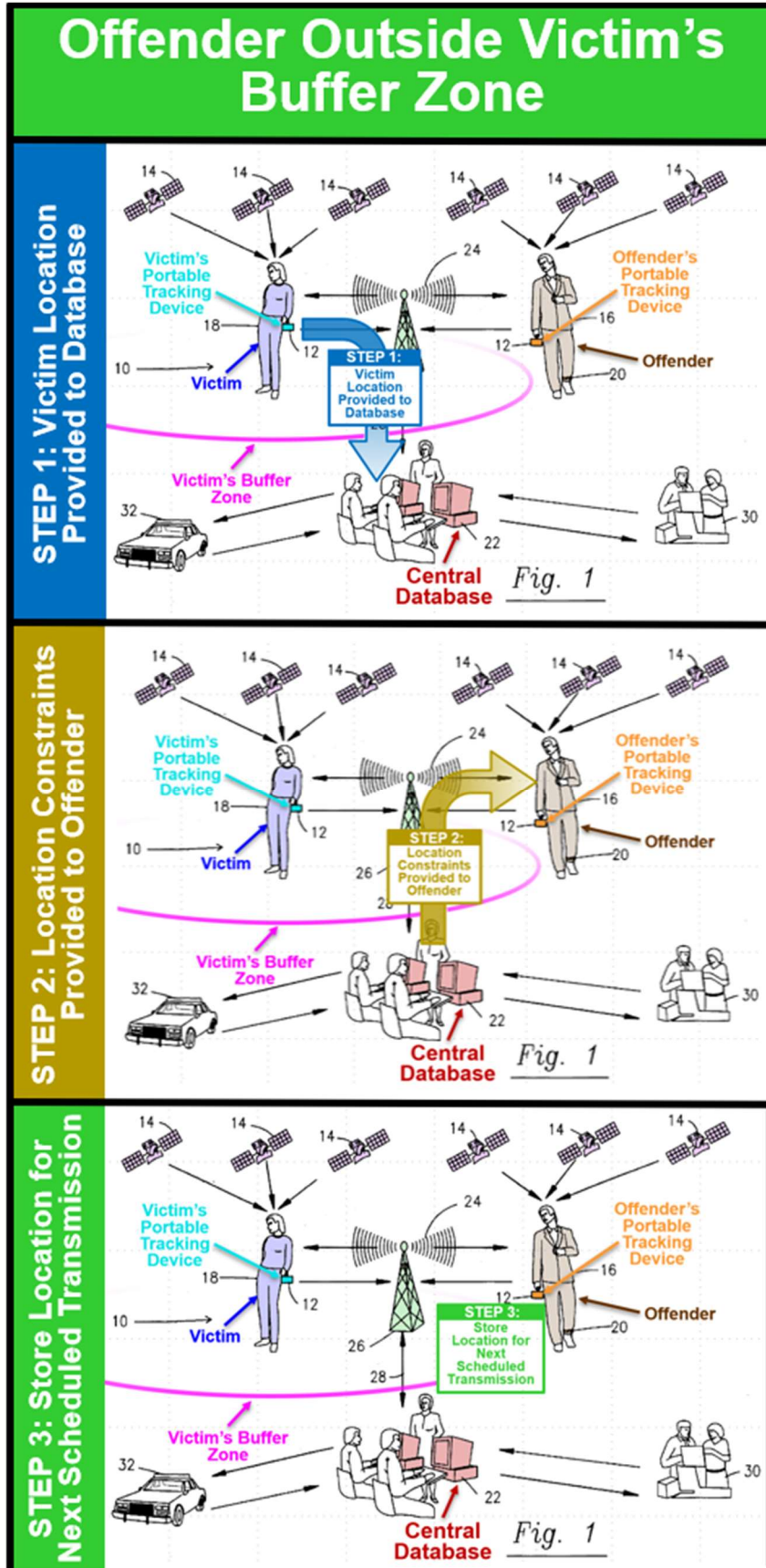


185. In step 1 of the above figure, the victim's portable tracking device transmits its current location to the central database. In step 2, the central database uses that received victim location to update the offender's location constraints (which include a buffer zone around the victim's location) and then transmits those updated location constraints to the offender's portable tracking device. In step 3, the offender's portable tracking device compares its current location to its updated location constraints, determines that it is currently located within the victim's buffer zone, and immediately notifies the central database that it is in violation of the victim's buffer zone.¹⁰

186. On the other hand, if the offender's "current location complies with the ... location constraints" it is stored by the device for upload to the central database at "the next scheduled time." Ex-1007, 7:14-19, Figure 6 B step 155 . This process is illustrated below, using annotated versions of Figure 1. The below images are similar to the ones above, except that, in response to determining that its location is not in violation of the victim's buffer, the offender's device does not immediately

¹⁰ While Layson'757's offender device notifies the central database each time it is located within the buffer zone around the victim device (i.e., is in "violation" of the victim's buffer zone), Layson'757 teaches that the central database's response to such violation notification will depend on "guidelines" stored at the central database for the offender. Ex-1007, 9:50-54 ("The central data-base system contains ***guidelines*** in the schedule rules for each offender regarding the notification response to corrections, law enforcement and victims based on the nature of the offender's violation."). This is discussed in further detail below, for Elements 15[C]-[D].

report its location to the central database. Ex-1007, 7:5-10 (“If the current location complies with the schedule rules and the location constraints 142 for the subject, then the location and status data is stored 144 in the portable tracking apparatus to be transmitted to the central data-base system on the next scheduled communication 146.”).



187. In particular, in step 1 of the above figure, the victim's portable tracking device transmits its current location to the central database. In step 2, the central database uses that received victim location to update the offender's location constraints (which include a buffer zone around the victim's location), and then transmits those updated location constraints to the offender's portable tracking device. In step 3, the offender's portable tracking device compares its current location to its updated location constraints, determines that it is currently located outside of the victim's buffer zone, and thus does not immediately transmit its location to the central database. Instead, it stores its location for later transmission to the central database according to its batch transmission schedule.

188. Thus, in Layson'757's system, the central database's transmission of updated location constraints causes an offender's portable tracking device either to transmit its location to the central database in response to determining that it is located within the buffer zone around the victim, or store its location for later batch transmission.

189. Layson'757 also discloses that the central database obtains the offender device's location as part of "data fusion processing" (Ex-1007, 7:42-55), where the database "analyzes developing situations such as a stalker-victim encounters" (*id.*, 8:50-56)—i.e., when a stalker is located within a victim's buffer zone:

The central data-base system evaluates if the subject's portable tracking

apparatus requires a command or **query message 201** based on results of previous violations, updates from the supervising agency or **as a result of data fusion processing**.

If a portable tracking device requires immediate contact for commands or queries, the central data-base system generates the data messages 202 to update the portable tracking device. The central data-base system will attempt communications with the portable tracking device 206. If the portable tracking device responds then its location and status data is stored in the central data-base system and commands and queries are sent to the portable tracking device 208.

Ex-1007, 7:42-55.

This distributed processing approach off-loads the central data-base system from collecting data in a continuous or real-time mode and allows the central data-base system to perform more temporal tasks such as **data fusion where it analyzes developing situations such as a stalker-victim encounters** and issues the appropriate warnings and instructions to all subjects.

Ex-1007, 8:50-56. Thus, when the central database has been notified that the offender is within the “specified geographic boundary of the first portable remote unit,” the central database would query both the victim and offender devices for their locations at the same time intervals (“obtaining ... at intervals during said tracking period”), while the offender device remained within the victim’s buffer zone, in order to accurately analyze the offenders’ locations relative to the victim, during this potential stalker-victim encounter, thereby performing the claimed function.

- d. Element 15[C]: iii) using the location obtained according to step (i) and (ii) to verify whether the first portable remote unit and second portable remote unit have maintained relative proximity during the tracking period;**

190. Layson'757-Layson'213 teaches Element 15[C]

191. Layson'757's victim and offender devices are located in proximity to one another when the offender device is located within the buffer zone around the victim. Because the victim and offender devices are in motion, as explained for Element 15[pre], verifying that the devices "have maintained relative proximity during the tracking period" corresponds to determining that the offender device remained located within the victim's buffer zone at each interval during the tracking period. This is taught by Layson'757-Layson'213, as I explain below.

192. As Layson'757 explains, the central database system may notify or report a violation of a victim's buffer zone to "corrections, law enforcement and victims based on the nature of the offender's violation" (Ex-1007, 8:9-20), according to "guidelines in the schedule rules for each offender" (Ex-1007, 9:50-54). *See also* Ex-1007, 3:3-8. Layson'757 explains that "[t]he schedule rules are driven by time of day and day of week as to where a subject's location is allowed or not allowed and describe the response actions taken by both the portable tracking apparatus and the central data-base system" to a potential violation. Ex-1007, 9:37-41. Thus, for example, a POSITA would have understood that the schedule rules may indicate that

an offender is permitted to be located in an area around his job site from 8am-5pm every Monday through Friday (when the offender is permitted to be at work), but not at other times.

193. A POSITA would have recognized that a variety of different guidelines could be implemented through Layson'757's "schedule rules," and would have been motivated to turn to Layson'213 for specific guidelines that a tracking system would use to determine whether or not to issue notifications to law enforcement and victims. Layson'213 teaches determining whether an offender's violation of an "exclusion zone" (e.g., a location from which the offender is banned according to a court order, such as Layson'757's "buffer zone") should be reported, based on the offender's presence in that zone for at least a "loiter time," in contrast to merely passing through (e.g., a "pedophile driving by a school on the way to work"). Ex-1008, 23:33-36. Layson'213's use of a loiter time helps to ensure that the offender's presence within the exclusion zone is reported as a violation when it is intentional, as opposed to transient and potentially inadvertent.

194. Indeed, as I explained in Section VIII.B.2.b, it was well-known in the context of offender-victim tracking to wait a prescribed time prior to alerting the victim and/or the authorities to an offender's violation, to prevent false positives. *See, e.g.*, Ex-1011, 7:65-8:7 (waiting "a predetermined time limit" before alerting a "supervising authority"); Ex-1041, 21:64-22:8 (waiting "a time window" to confirm

a detected violation); Ex-1043, 16:2-7 (waiting a “grace period” before reporting a violation). Accordingly, in the combined Layson’757-Layson’213 system, the offender’s “schedule rules” would include a specified “loiter time” over which the offender’s presence within the victim’s buffer zone is to be reported as a violation.

195. As explained above with respect to Element 15[A] (“intervals during said tracking period”), Layson’213’s loiter time would have been chosen to cover two or more intervals over which the victim’s and offender’s locations are reported, to ensure that the time over which the offender maintained close proximity to the victim is sufficient to qualify as loitering within the victim’s buffer zone, as opposed to a transient and inadvertent violation. In this manner, Layson’213’s loiter time may be used to identify intentional violations of the victim’s buffer zone, which pose a real threat to the victim. Accordingly, Layson’213’s loiter time would correspond to a “tracking period.”

- e. **Element 15[D]: iv) forwarding the result of the verification to a network requestor at the end of the tracking period.**

196. **Forwarding the result:** Layson’757-Layson’213 teaches alerting the victim (through their portable monitoring device) and/or law enforcement, in response to determining that the offender maintained relative proximity to the victim during the tracking period. In particular, a POSITA implementing Layson’757’s system would have been motivated to include Layson’213’s loiter time as part of

Layson'757's "guidelines" for reporting a violation described above, such that Layson'757's central database only sends reports to law enforcement/victims indicating that the offender's tracking device is in violation of the buffer/exclusion zone around the victim's tracking device after determining that the offender device has maintained close proximity to the victim's tracking device for a duration of a loitering tracking period. A POSITA would have been motivated to do so because it would both waste law enforcement resources and place unnecessary stress on victims to send out notifications for temporary, inadvertent occurrences, such as when an offender is temporarily passing through a buffer/exclusion zone while driving on their way to work, as taught by Layson'213 (Ex-1008, 23:33-36). For example, in the context of home alarm systems, it was well-known that "false alarms present a serious threat to the effectiveness of police departments and to the safety of the communities they serve," given the strain they place on police resources, and the "sense of complacency among officers" that they may breed. Ex-1053, 0002, 0005.

197. **Network requestor:** As explained for Element 15[pre], Layson'757's victim corresponds to a wireless consumer associated with Layson'757's wireless network. A POSITA would have understood that Layson'757's central database tracks proximately-located offenders and alerts the victim to their presence at the victim's request, based on the victim's voluntary enrollment in the monitoring

system (Ex-1007, 6:19-25) and transmission of their location coordinates to the central database. Indeed, because, in response to sending his/her location to the central database, the victim is alerted to the presence of any offenders in violation of his/her buffer zone, a POSITA would have recognized that each transmission of location coordinates by the victim's portable tracking device corresponds to a request to be alerted to the presence of any nearby offenders. Layson'757's victim thus corresponds to a "network requestor."

198. Law enforcement officials, to which a report of the violation is provided over the network (Ex-1007, 8:16 ("alarms to law enforcement")), also correspond to network requestors. For instance, as with the victim, a POSITA would have understood that Layson'757's central database provides alerts to law enforcement at their request, based on their use of the monitoring system (Ex-1007, 3:3-8). Additionally, in the Layson'757-Layson'213 system, "[q]ueries for location history data can be performed by law enforcement." Ex-1007, 3:24-25; *see also* Ex-1008, 10:11-23. In the combined Layson'757-Layson'213 system, these queries are performed using "query terminal 39" "connect[ed] to the communications network 4." Ex-1008, 10:11-13. Accordingly, the law enforcement agent performing the query is a "network requestor." A POSITA would have recognized that such queries could be performed by law enforcement to obtain evidence of a stalker's restraining order violation (Ex-1007, 8:54-55) for use in a subsequent legal proceeding, as was

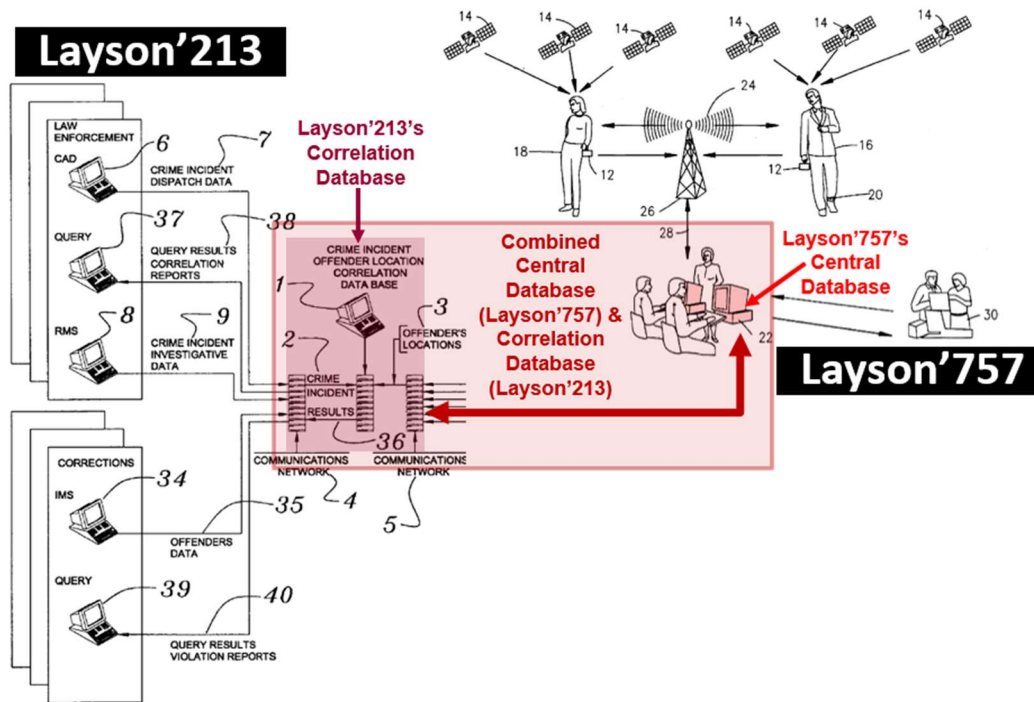
well-known in the prior art. *See supra* Section VIII.B.2.b; Ex-1011, 20:9-12 (the victim's and offender's positions may be stored for later use "as evidence during a subsequent legal proceeding, as example as proof of violation of the court issued restraining order"). A POSITA would have understood that the central database would provide to the law enforcement agent, as a result of the query (Ex-1008, 10:11-23), the locations of the victim and offender devices, when they were located in relative proximity to one another over the tracking period (to help ensure the proximity was not due to temporary, inadvertent occurrences), as determined by the central database.

B. Ground 2: Claims 1 and 22 are rendered obvious by Layson'757-Layson'213-IllinoisLaw

1. A POSITA would have been motivated to combine Layson'757-Layson'213-IllinoisLaw with a reasonable expectation of success

199. As I explained in Section XIII.A.1, a POSITA would have been motivated to combine Layson'757-Layson'213. First, Layson'213 incorporates Layson'757 by reference (Ex-1008 2:28-30). Thus they are analogous art, and Layson'213 contains an explicit teaching to include Layson'757. Specifically, in the combined Layson'757-Layson'213 system, the reporting and correlating actions of Layson'213's correlation database (Ex-1008, 19:41-20:27) would be performed on the locations of Layson'757's portable tracking devices received at Layson'757's central location (Ex-1007, 7:9-19).

200. In particular, Layson'213's correlation database stores position data for multiple offenders, and, in the combined Layson'213-Layson'757 system, that position data would include offender positions provided by Layson'757's central database, as illustrated below:



See also:

The crime incident/offender location correlation database 1 is a relational data base that **receives** crime incident data 2 and **offender location data 3** on a continuous basis.

Ex-1008, 8:28-31;

Offender location data 3 is comprised of location data derived from the following sources;

- 1) House arrest location systems 10 as known in the art that provide location data when the offender is at home,
- 2) Location recording 14 as described by this invention that collects

locations of offenders determined by GPS, on a twenty four hour basis,

3) Continuous location monitoring 18 of offenders determined by GPS as known in the art, on a twenty four hour basis,

4) Continuous location monitoring 22 of offenders determined by RF triangulation as known in the art on a twenty four hour basis,

5) Voice recognition with caller identification locating systems 26 as known in the art that provide location data when the offender calls and

6) Mobile cellular triangulation locating systems 30 as known in the art that provide location data when the offender calls or is called.

Ex-1007, 8:55-9:6.

201. Layson'213 teaches that its correlation database may be used to identify potential suspects (from the set of known offenders whose locations are stored in the database) who may have committed a series of crimes. In particular, Layson'213 teaches providing the correlation database with multiple crime incidents, and "correlating [those] crime incidents with offender(s) locations" (Ex-1008, 21:37-39), to generate a table reporting "suspect offenders" (Ex-1008, 21:59-64):

FIG. 11 is a flowchart of the method of operation for the query terminal 37,39 **correlating multiple crime incidents with offender(s) locations** based on the following criteria;

1) For each crime incident, a date or range of dates (i.e. spanning midnight, time of crime incident could have occurred in a multiple day interval, etc.),

2) For each crime incident, a time period (i.e. the exact time covers multiple hours),

3) For each crime incident, a specific crime incident identification and

4) For each crime incident, a buffer distance around crime incident location (i.e. increased buffer area due to time period, offender's travel

speed, etc.).

Ex-1008, 20:37-49.

Each offender's data from an offender location monitoring system 220 is correlated against the structured multiple crime incident query criteria 265. For those offenders that have location data that does match more than one structured crime incident query criteria 265, **a table report of multiple crime incident suspect offenders is generated 266.**

Ex-1008, 20:58-64.

202. One such crime is stalking. Layson'757 teaches that the crime of stalking involves a prolonged victim-offender encounter. Ex-1007, 8:54-55; *see also* Ex-1055, 0001 (describing stalking as involving following and maintaining surveillance of a victim). A POSITA would have recognized that the Layson'757-Layson'213 combined system could be used to identify offenders located within a buffer region of the victim (the location of the "crime incident" (Ex-1008, 21:37-39) for a prolonged period of time as potential criminal stalkers (Ex-1008, 21:59-64 (identifying "suspect offenders")). In particular, for a victim who suspects that he/she is being stalked, the combined Layson'757-Layson'213 system could be used to identify potential stalkers from the set of offenders for whom the system stores location data, by providing the system with the victim's location(s), as "crime incidents." For instance, the combined Layson'757-Layson'213 system could identify that an offender previously arrested for stalking a first victim, is now potentially stalking a second victim, by correlating the second victim's location with

the offender's location. Notably, it was well-known that stalkers often have a history of prior criminal offenses, including prior instances of stalking. Ex-1054, 0005.

203. As I explained in the Background Section, at the same time early offender tracking systems were being developed, the crime of stalking had emerged as a major concern. *See supra* Section VIII.B.2. For instance, in the early 1990s, the National Institute of Justice ("NIJ") was both involved in both the development of offender tracking systems, and involved in addressing the crime of stalking, including through the development of a model anti-stalking code. *See supra* Section VIII.B.2.c; Ex-1040. And, during the 1990s, all 50 States enacted anti-stalking legislation to address this threat, which had gained public attention based, in part, on high-profile instances of celebrity stalkers. *See supra* Section VIII.B.2.c. It is thus unsurprising that early developers of offender tracking systems (including those receiving NIJ support) recognized that such systems could not only to identify offender parole/probation violations, but also to identify potential stalking incidents. *See, e.g.*, Section VIII.B.2.c; Ex-1039, 0001-0002.

204. Accordingly, not only would a POSITA have been motivated to implement a tracking system to address the newly defined crime of stalking, but the POSITA would have been motivated to implement a system that identifies potential stalking incidents using the legal definition of the crime. For example, IllinoisLaw provides Illinois's definition of "stalking." Ex-1010. IllinoisLaw teaches that the

crime of stalking may be characterized by the stalker “mov[ing] in relative proximity to a person as that person moves from place to place.” Ex-1010. A POSITA seeking to use Layson’757-Layson’213’s system to address the crime of stalking would thus have been motivated to design a system that would identify potential stalking scenarios based on a potential offender’s present in proximity to the victim, which is maintained even as that victim “moves from place to place.” *Id.* A POSITA would have understood that following a person as they moved “from place to place” would correspond to following that person for at least longer than an incidental distance (e.g., from home to work), because following for a *short* distance might be accidental and innocent. *See, e.g.,* Ex-1037, 0011 (reviewing anti-stalking legislation to create a “comprehensive definition of stalking,” and characterizing stalking as involving following over “a prolonged distance”).

205. A POSITA seeking to detect stalking, based on the legal definition of the crime, which requires following “*from place to place*” as taught by IllinoisLaw, Ex-1010, 0009-0010, would have recognized that the combined Layson’757-Layson’213 system could easily be modified to detect instances in which another portable tracking device travels in proximity to a victim tracking device from one place to another. As described below, this could be done using Layson’213’s correlation database, to detect potential stalking by an unknown criminal offender, and/or Layson’757’s database, to detect instances in which a known offender is

stalking the victim at a distance outside that which violates their restraining order's minimum separation distance.

206. **Using Layson'213's correlation database to identify potential stalkers who have traveled "from place to place" with the victim:** In the combined Layson'757-Layson'213-IllinoisLaw system, a potential stalking victim's locations (and the corresponding times the victim was present at those locations), as captured by Layson'757's victim portable tracking device as the victim traveled from one place to another (e.g., from work to home), could be used as the "multiple crime incidents" provided in a query of Layson'213's correlation database (as described above), to identify offenders located within a buffer distance around the victim's locations at approximately the same times, as the victim traveled from one place to another. In particular, for a potential victim who believes he/she is being followed when he/she travels from one place to another (e.g., from work to home), law enforcement could assign the victim a portable tracking device to track his/her location during such travel (as taught by Layson'757). The locations and corresponding times that are captured by the victim portable tracking device could then be used in Layson'213's correlation database to identify any offenders (e.g., individuals who may have previously been arrested for stalking or other harassing behavior, and who are subject to location monitoring as a condition of probation/parole) whose locations correlate with those of the potential victim during

the victim's travel. For instance, if Layson'213's correlation database determined that a given offender's locations correlated with those of the victim on two or more occasions, as that victim traveled from work to home, this would provide strong evidence that the offender may be stalking the victim.

207. In summary, if a potential stalking victim believed that he/she was being stalked by some unknown offender (or an offender against whom the victim already holds a restraining order), law enforcement could use the Layson'757-Layson'213 to identify potential suspect stalkers. This would be done by providing the victim with one of Layson'757's portable tracking devices, which the victim would carry while traveling from place to place (e.g., work to home), and which would capture the victim's positions (and corresponding times at those positions) during the victim's travel. Law enforcement could then instruct Layson'213's correlation database (e.g., through a manual query) to use those captured locations as a series of "multiple crime incidents." Layson'213's correlation database would then output a table report identifying one or more offenders (potentially unknown to the potential stalking victim, but subject to location monitoring as a result of a prior arrest) who were located in proximity to two or more of the potential victim's positions at or around the same time as the victim. Because, in many instances, an offender's presence near the victim for more than Layson'213's "loiter time" may be innocent (e.g., if both the victim and offender(s) are located in the same general

area over time, such as a shopping mall, or a city park), in order to limit false positives, the list would be filtered to identify only those offenders whose locations correlated with those of the victim as the victim traveled “from place to place,” as taught by IllinoisLaw. For instance, it is unlikely that an identified offender who was located in proximity to the victim only while the victim walked through a park was actually stalking the victim, whereas another identified offender who maintained proximity to the victim for almost all of the victim’s travel from work to home may present a strong stalking candidate.

208. **Using Layson’757’s database to identify potential stalking behavior of offenders who have traveled “from place to place” with their victim, without violating their restraining order’s minimum distance separation:** While the above-described combination could be used to identify potential stalkers whose identities are unknown to the victim (e.g., offenders who are subject to location tracking based on a prior arrest for stalking a *different* victim), the combined Layson’757-Layson’213-IllinoisLaw system could also be used in a separate manner to alert a victim and/or law enforcement to potential stalking behavior of an offender against whom the victim already holds a restraining order. I describe this separate implementation below.

209. Layson’757 teaches that “wide[] buffer zones” may be implemented around “locations that are meant to [] exclude a subject,” such as a victim (Ex-1007,

9:43-46), enabling “advanced notification” of a nearby offender to be provided to the victim. Ex-1007, 7:39-43. Layson’757 also teaches that the central database “contains guidelines” regarding the “notification response to corrections, [and] law enforcement” based on the nature of the offender’s violation of the victim’s buffer zone. Ex-1007, 9:50-54. Based on these disclosures, a POSITA would have recognized that Layson’757’s system may be used to warn a victim of a nearby offender even if that offender is not yet in violation of a minimum required separation distance prescribed in a restraining order, while waiting to alert law enforcement until the offender is in violation of the restraining order. For instance, the offender’s location constraints could identify a wide buffer area around a victim (e.g., a circular region of radius larger than the minimum required separation distance between the victim and offender, as proscribed by a restraining order held by the victim against the offender), as well as a smaller buffer area around the victim (e.g., a circular region of radius equal to the restraining order’s minimum separation distance). And the offender’s schedule rules could indicate that, when the offender is located within the wider buffer area, a notification should be sent to the victim, but not law enforcement, whereas, when the offender is located within the smaller buffer area, both the victim and law enforcement should be notified. Notably, it was known in the prior art to include multiple such buffer regions around a victim. Taylor, for example, teaches defining multiple perimeters around a victim, each

associated with a different response by the system to the perimeter's violation by an offender. Ex-1011, 20:58-21:15.

210. Layson'757 explicitly states that its system may be used to address "stalker-victim encounters." Ex-1007, 8:54-57. A POSITA also would have recognized that the act of stalking a victim may violate a restraining order, even where the offender maintains the minimum separation distance from their victim specified by the restraining order. For instance, an offender who is required to remain 100 feet away from a victim, yet follows the victim everywhere he/she goes, placing the victim in fear for his/her safety, but ensuring to remain at least 101 feet from the victim, may be guilty of the crime of stalking and thus in violation of his/her restraining order, even though he/she technically complied with the minimum separation requirement.

211. In order to alert law enforcement to such behavior, a POSITA would have been motivated to implement a system that addresses the legally-defined characteristics of stalking, such as following and maintaining surveillance as the victim "move[s] from place to place," as taught by IllinoisLaw. Ex-1010, 0009-0101. To capture such movement "from place to place," a POSITA would have included a "minimum distance" threshold in Layson'757's system, as taught by IllinoisLaw, because following for a *short* distance might be incidental and innocent, while following for a "prolonged distance" may cross the line into stalking. *See, e.g.,*

Ex-1037, 0011. Notably, the requirement of following “from place to place,” as taught by IllinoisLaw, is not necessarily quantifiable in advance. Accordingly, in designing a system to identify such stalking behavior, a POSITA would have selected some minimum distance as a threshold for when incidental proximity is considered actual following sufficient to alert a victim or authorities (similar to Layson’213’s “loiter time” threshold). Such a minimum distance could be made adjustable as typical of alarm thresholds used in various contexts.

212. Thus, in the combined Layson’757-Layson’213 system, the system would be configured to alert a victim/law enforcement to a potential restraining order violation in response to detecting one of the following situations:

(1) the offender is located within a wide buffer zone around the victim (i.e., in proximity to the victim, but not necessarily in violation of a minimum distance requirement specified in a restraining order held by the victim against the offender), and the offender remains within this buffer zone as both the victim and offender travel a minimum distance threshold; and/or

(2) the offender is located within a smaller buffer zone around the victim (i.e., in violation of the minimum distance requirement specified in the restraining order), and the offender remains within this smaller buffer zone for more than a loiter time.

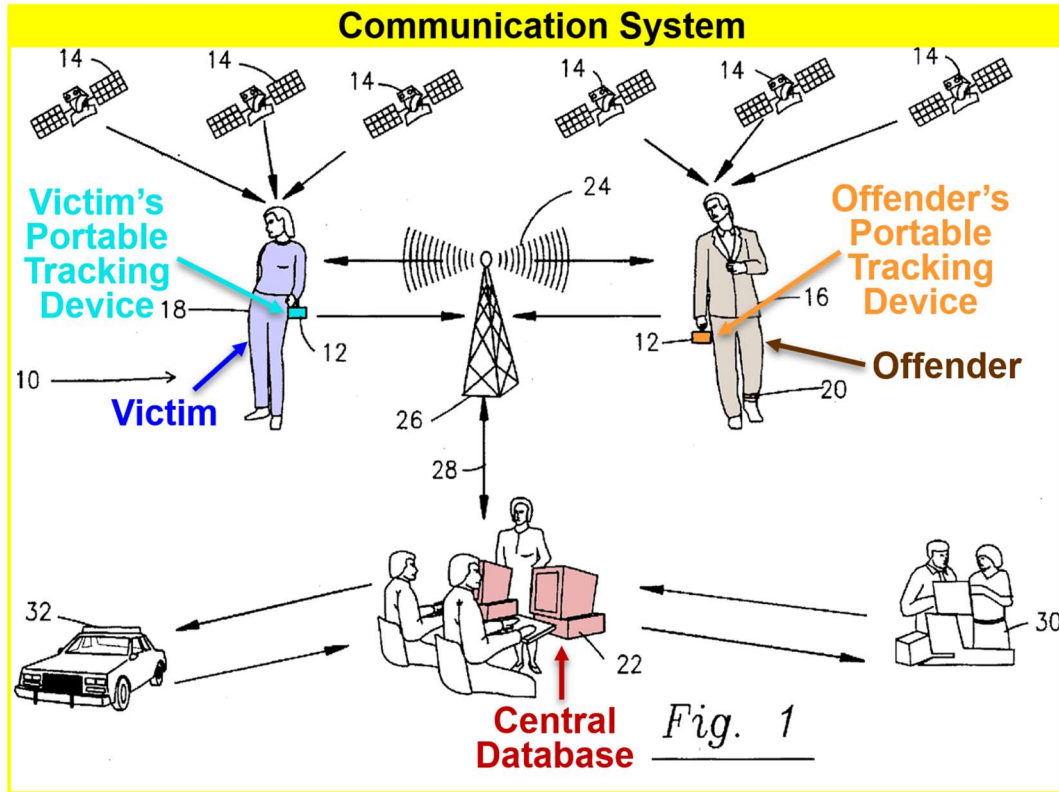
2. Independent Claim 1

a. Element 1[pre]: A communication system comprising:

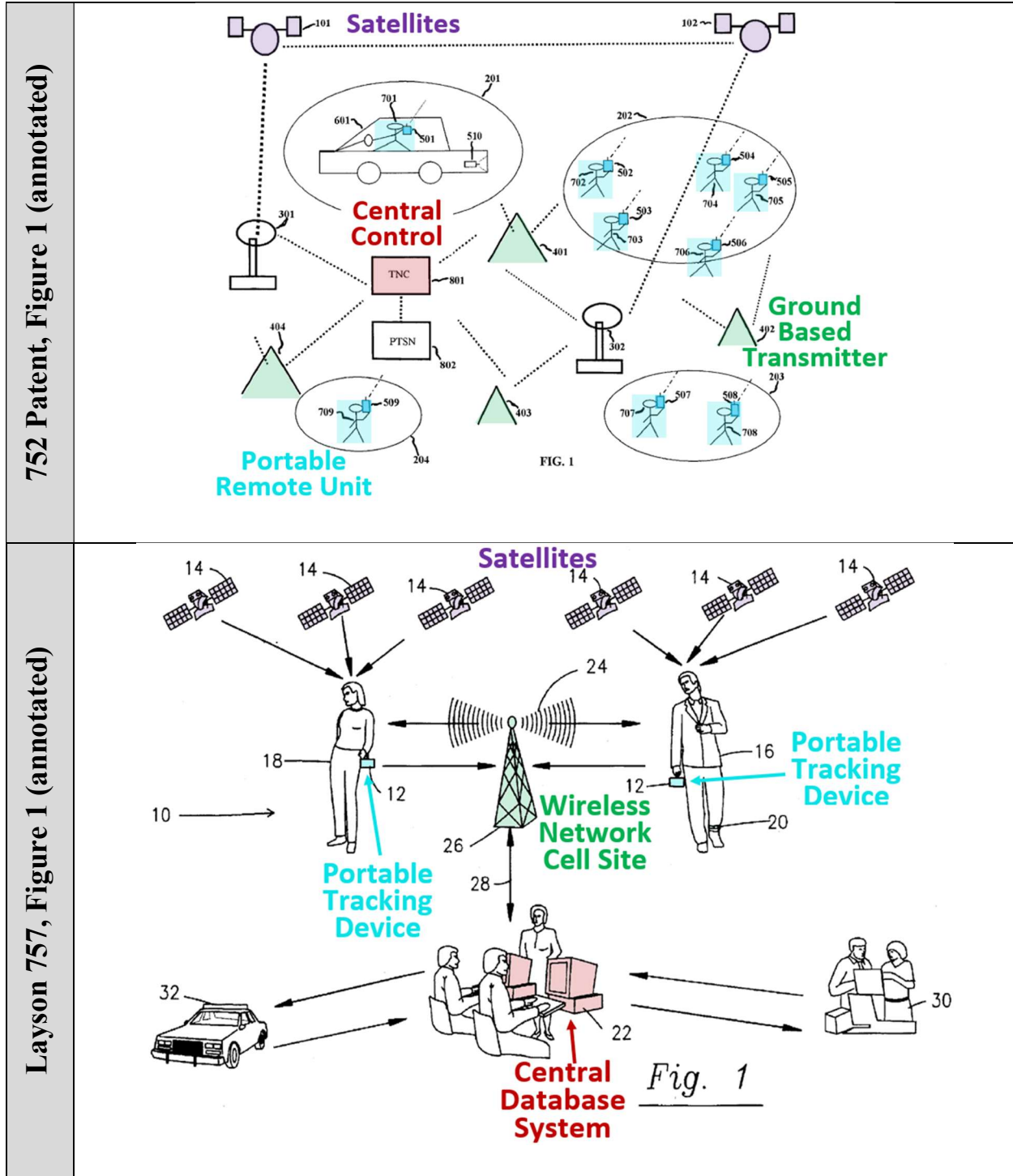
213. Layson’757-Layson’213-IllinoisLaw teaches the preamble of Claim 1, to the extent it is limiting.

214. The ’752 Patent states that a “mobile location reporting communication system consists of a network of communication sources and targets managed by one or more control stations.” Ex-1001, Abstract.

215. Layson’757 discloses a communication system in the form of “system 10,” as illustrated in annotated Figure 1, below, which includes “a portable tracking device 12” for each “subject (offender 16 or victim 18)” (Ex-1007, 2:46-49) connected with “central data-base system 22” (Ex-1007, 3:9-12) via “network cell site 26” (Ex-1007, 2:65-3:2). Central database system 22 is a control system, because it can query the tracking devices, send messages, and load rules and constraints that are then used by the portable units to report positions and detect and report violations. Ex-1008, 3:9-23.



216. Indeed, Layson '757's "system 10" is of the same form as the '752 Patent's "communication system," as illustrated by the below comparison between Figure 1 of Layson '757, and Figure 1 of the '757 Patent.



b. Element 1[A]: a portable mobile remote unit;

217. Layson'757-Layson'213-IllinoisLaw teaches Element 1[A].

218. Layson'757's victim portable tracking device corresponds to the

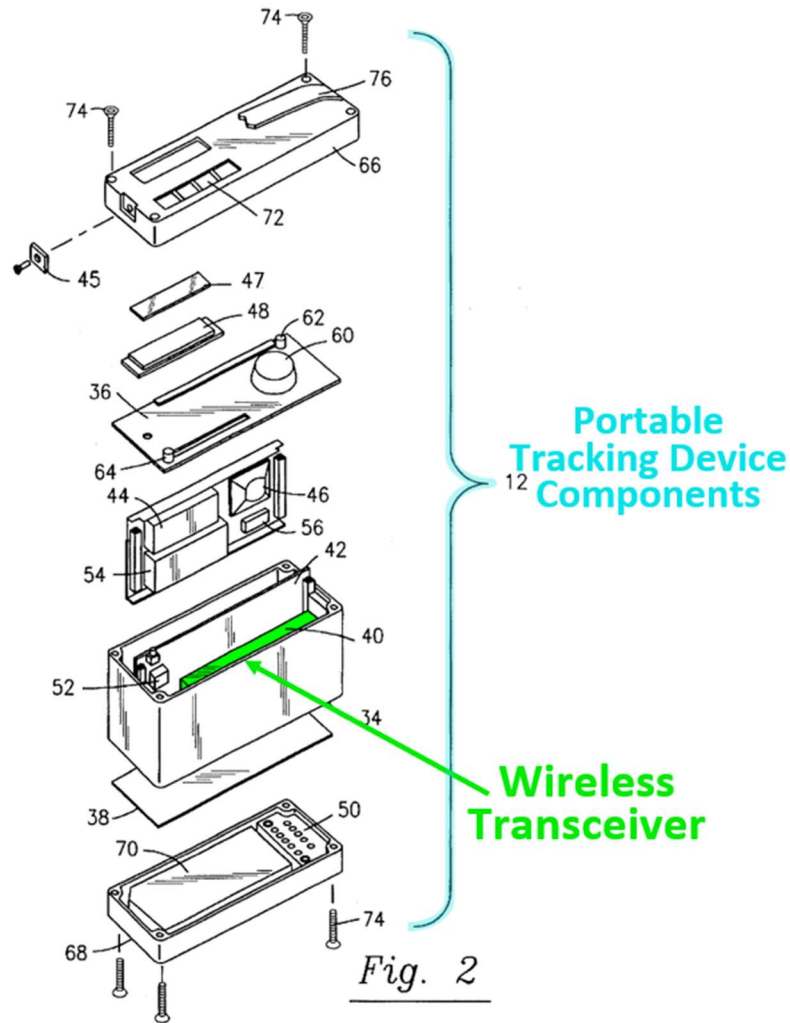
claimed “portable mobile remote unit,”¹¹ because it obtains and transmits position information to the central location as the monitored person moves about (id., 1:62-66, 7:66-8:5 (similar)), as explained for Element 15[pre].

c. Element 1[B]: a network of communication units;

219. Layson’757-Layson’213-IllinoisLaw teaches Element 1[B].

220. Each of Layson’757’s portable tracking devices is a “communication unit” because it is capable of sending and receiving communications. *See, e.g.*, Ex-1007, 3:3-4 (“The communication from the subject’s portable tracking device 12 is routed to the central data-base system 22”), 3:9-12 (“The central data-base system 22 communicates to the subject’s portable tracking device 12”). As illustrated below in annotated Figure 2, such communication is enabled through a “wireless transceiver 40 [that] provides two-way data and voice communications between the portable tracking device 12 and the central data-base system 22.” Ex-1007, 3:36-38.

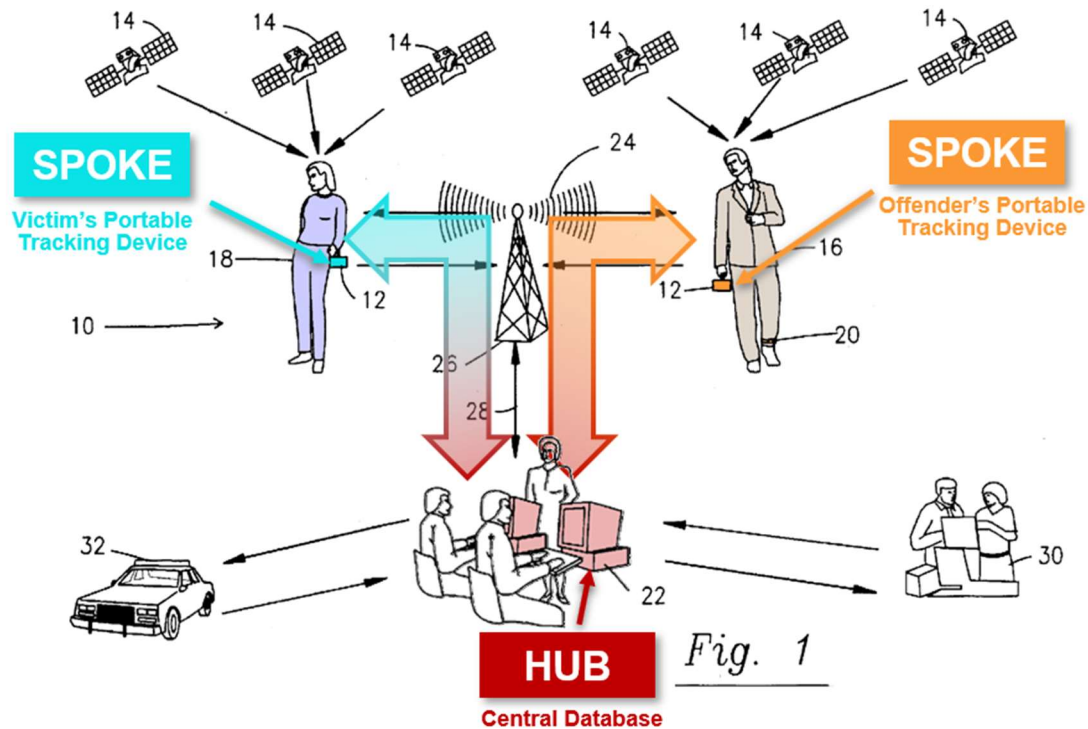
¹¹ Notably, Element 1[F], below, recites “means to determine and report to the system upon request that, *another mobile remote unit* of the network has tracked the portable mobile remote over a period of time.” Thus, this Ground maps Layson’757’s victim’s portable tracking device to the claimed “portable mobile remote,” and Layson’757’s offender portable tracking device to the claimed “another mobile remote unit,” given that it is the “another mobile remote unit” that has performed the “track[ing].”



221. Layson’757’s system includes multiple portable tracking devices. Ex-1007, 2:46-49, 7:35-38 (“[T]he central data-base system 22 implements distributed and parallel processing in order to perform event processing for **the multiple portable tracking apparatus** in real-time.”).

222. Together with the central database system, Layson’757’s portable tracking devices form “a network of communication units,” because each device is communicatively connected to the central database system, as illustrated in annotated Figure 1, below. Ex-1007, 3:9-11 (“The central data-base system 22

communicates to the subject's portable tracking device 12 via the wireless communication link 24.”).



In particular, a POSITA would have recognized this configuration—i.e., a set of devices configured to communicate with a central control location—as corresponding to a “hub-and-spoke” communication network, as I describe in the Background Section. *See* Section VIII.C; *see also* Ex-1049, 0004; Ex-1050, 0026.

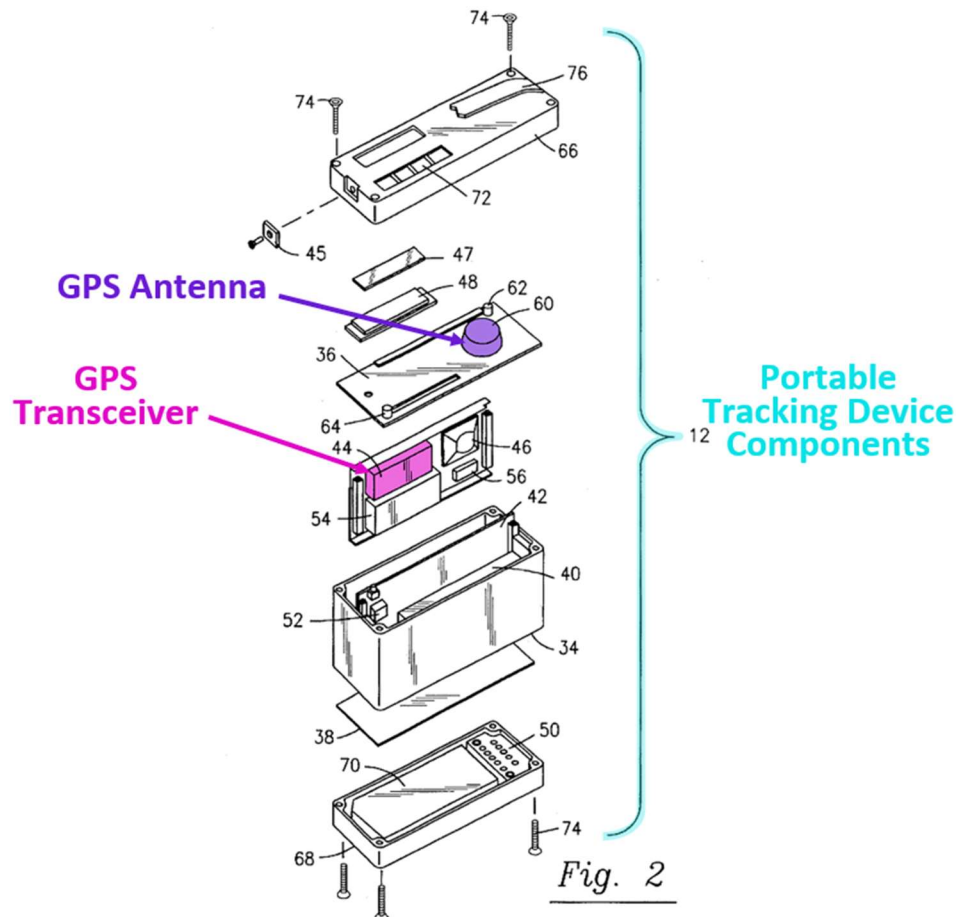
d. Element 1[C]: means to obtain the location of the portable mobile remote unit;

223. Layson’757-Layson’213-IllinoisLaw teaches Element 1[C].

224. Layson’757 teaches the claimed “means” under the construction proposed in Section VII.A.1, which is equivalent to “an antenna 20 and a transceiver

21” configured to receive signals, together with a “control unit” programmed to use such signals to determine location.

225. As illustrated in annotated Figure 2, below, each portable tracking device includes “GPS antenna 60,” which communicates with “the GPS satellite constellation” and provides signals to “GPS transceiver 44.” Ex-1007, 4:23-35. GPS transceiver 44 is also a control unit, because it uses the received signals to “determin[e] location.” Ex-1007, Abstract, 3:45-48 (similar).



226. Each of Layson’757’s portable tracking devices performs the recited function each time it (1) uses GPS antenna 60 and transceiver 44 to acquire GPS

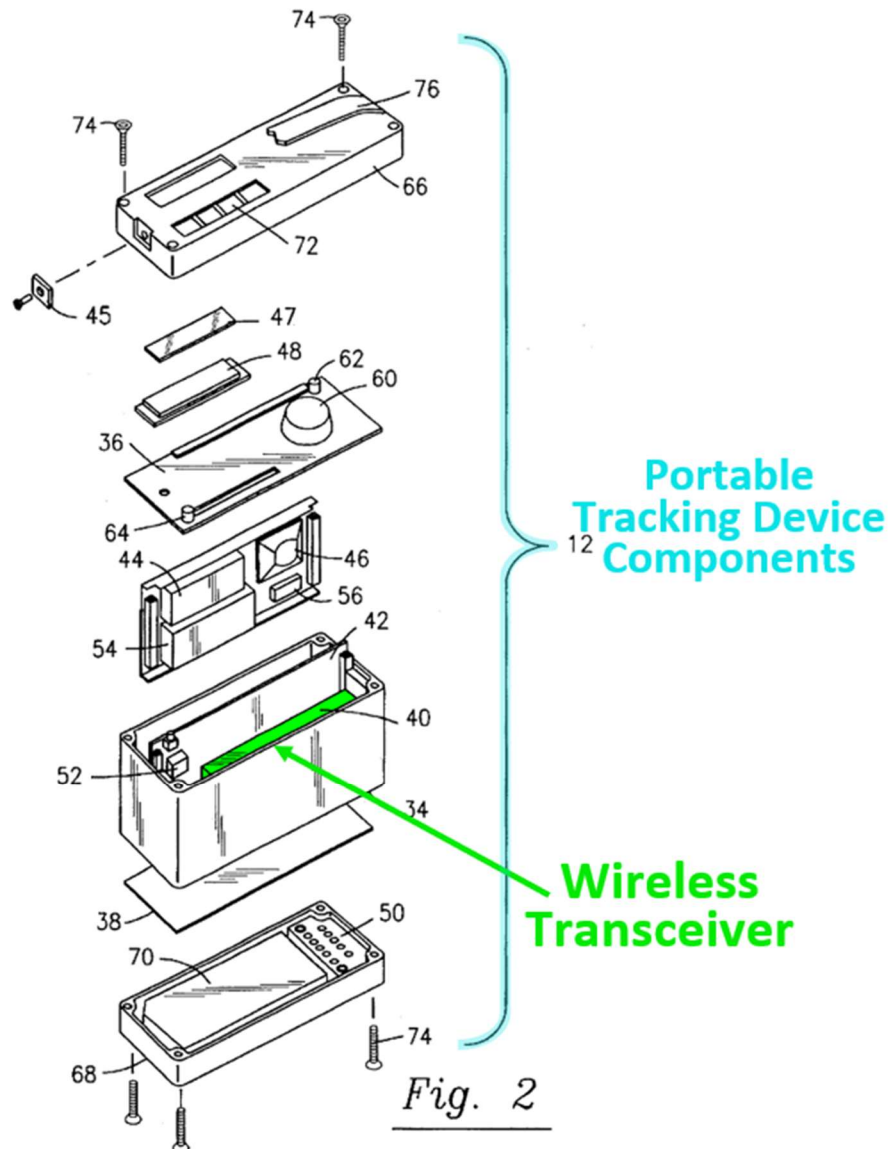
signals (Ex-1007, 4:23-35), and then (2) uses GPS transceiver 44 to determine the current location of the device using those signals (Ex-1007, Abstract).

- e. **Element 1[D]: means to obtain geographic boundary information in order to disclose a global location at the network;**

227. Layson’757-Layson’213-IllinoisLaw teaches Element 1[D].

228. Layson’757-Layson’213 teaches the claimed “means” under the construction proposed in Section VII.A.2, which is equivalent to “an antenna 20 and a transceiver circuitry 21” configured to receive signals that include geographic boundary information.

229. As illustrated in annotated Figure 2, below, each of Layson’757’s portable tracking devices includes a “transceiver 40” that “provides two-way data and voice communications between the portable tracking device 12 and the central data-base system 22.” Ex-1007, 3:36-38.



230. Such data received by the transceiver from the central database includes “geographic boundary information” in the form of location constraints. As explained for Element 15[B], the central database sends “location constraints” to each portable tracking device (Ex-1007, 8:36-39), which identify “buffer zones” around locations

meant to exclude a subject.¹² Ex-1007, 8:36-43, 9:41-43 (similar). These dynamically-updated location constraints (Ex-1007, 9:42-44) “are sent from the central data-base system to the portable tracking apparatus.” Ex-1007, 9:45-50.

231. A POSITA would have understood that, in addition to providing Layson’757’s offender devices with location constraints that include buffer zones around the current locations of any associated victims’ devices, Layson’757’s central database would provide Layson’757’s *victim* devices with location constraints that include buffer zones around the locations of any associated offenders’ devices.¹³ Ex-1007, 1:17-18 (location constraints are provided to both

¹² Layson ’757 defines the monitored “subjects” as including both the offender and the victim: “subjects, such as criminal offenders and victims.” Ex-1007, 1:17-18. *See also, id.*, 1:9.

¹³ Notably, for this Ground maps the claimed “geographic boundary” to a region defined around the *offender* portable tracking device, within which the *victim* portable tracking device will transmit its location to the central database. This is in contrast to the mapping in Ground 1, in which the “geographic boundary” was mapped to a region around the *victim* portable tracking device, within which the *offender* portable tracking device will transmit its location to the central database. The reason for this difference is as follows: As explained above for Element 1[A], because Element 1[F] recites “means to determine and report to the system upon request that, *another mobile remote unit* of the network has tracked the portable mobile remote over a period of time,” this Ground maps Layson’757’s victim’s portable tracking device to the claimed “portable mobile remote,” and Layson’757’s offender portable tracking device to the claimed “another mobile remote unit.” Accordingly, because Element 1[E] below recites “means to provide the location of the portable mobile remote unit to the network upon determination that the portable mobile remote unit is within the geographic boundary obtained at the

offenders and victims). In particular, the victim device would receive the associated offender's location and "buffer zone" around that location (Ex-1007, 8:36-43) (the claimed "geographic boundary information"), so that the victim does not enter it inadvertently.

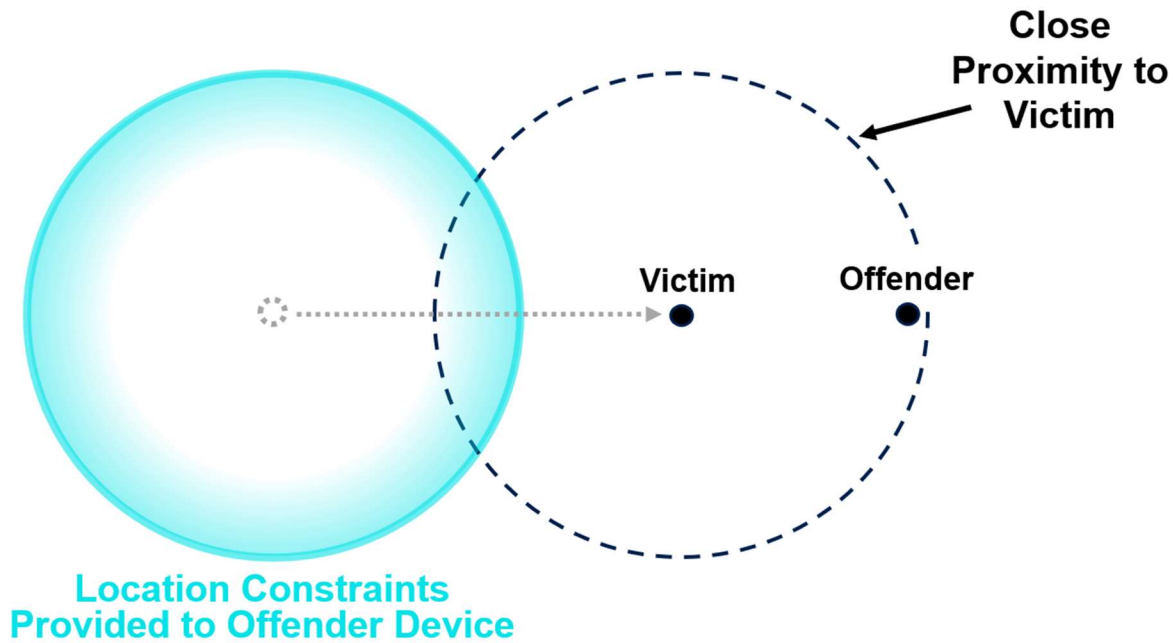
232. The below figures illustrate this concept in detail. In particular, the below figures illustrate how providing a buffer zone around the *offender's* current location to the *victim's* portable tracking device (in the form of a location constraint provided to the victim device), may enable Layson'757's system to detect violations of the victim's buffer zone sooner than if only that buffer zone around the victim's current location is provided to the offender's portable tracking device (in the form of a location constraint provided to the offender device).

233. As illustrated below, first consider a scenario in which the offender device is provided with location constraints that include a buffer zone around the victim's current location (light blue), but the victim device is *not* provided with location constraints that include a buffer zone around the offender's current location:

network," the claimed "geographic boundary" is one within which Layson'757's victim portable tracking device will disclose its location to the network, rather than Layson'757's offender portable tracking device.

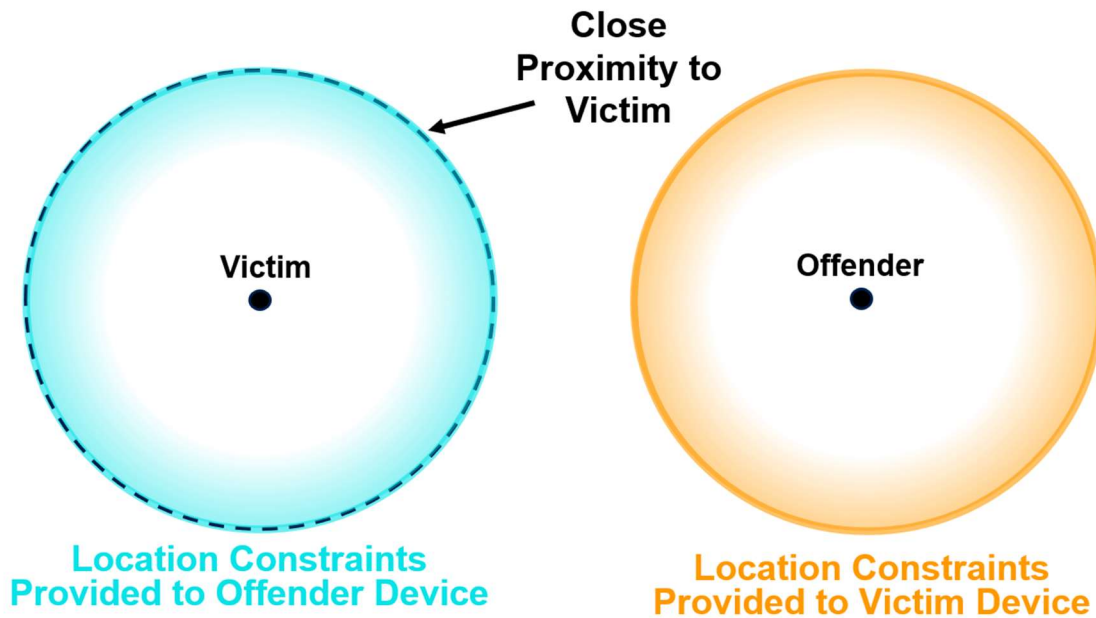


As explained above, provided that the offender device is not in violation of these location constraints, it does not need to transmit its location to the central database. However, consider a situation in which the victim moves closer to the offender, causing the offender to be in close proximity to the victim. If the victim device has not updated the central database with its new location (e.g., the victim device's next scheduled batch transmission time has not yet occurred), the offender device is unaware that it is now in violation of the region of close proximity to the victim, as illustrated below:

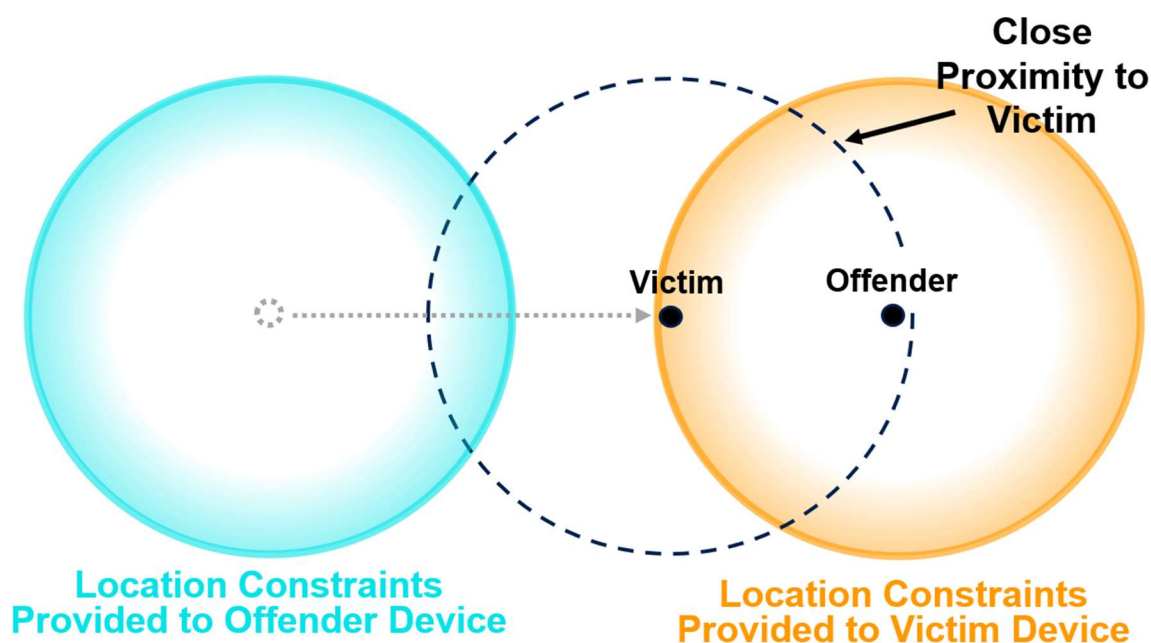


In particular, the offender device is unaware of the victim's movement and continues to compare its current location to the buffer zone around the victim's last reported location (which is now stale, as the victim has moved). Because the offender device is not in violation of that stale buffer zone, the offender device does not report a violation to the central database.

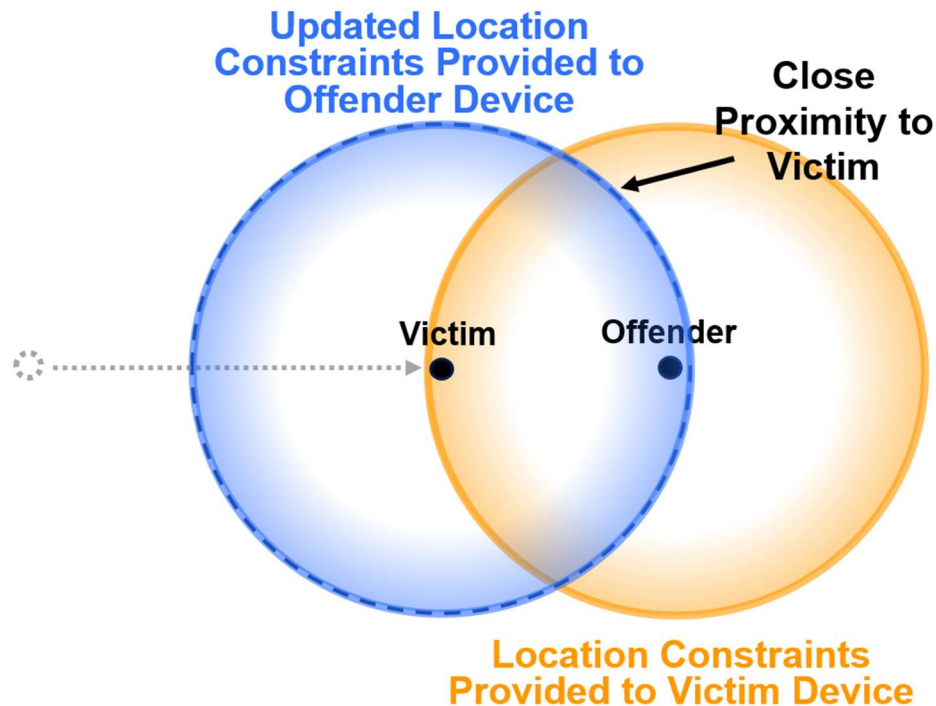
234. On the other hand, consider a scenario in which the offender device is provided with location constraints that include a buffer zone around the victim's current location (light blue), **and** the victim device is provided with location constraints that include a buffer zone around the offender's current location (orange), as illustrated below:



If the victim moves closer to the offender causing the victim and offender to be in close proximity, even though the offender device is unaware that it is now in violation of the region of close proximity to the victim, because the victim device is in violation of its location constraints (i.e., the victim has moved into the buffer region around the offender's location, as illustrated in orange), as illustrated below, the victim device will report this violation to the central location:



The central location will then provide updated location constraints to the offender device (dark blue), from which the offender device will determine that it is in violation of the victim's buffer zone:



Thus, by providing a buffer region around the offender's last reported location to the victim's device (as a location constraint against which the victim's device compares its current location and reports violations to the central database), the central database may be notified when the victim and offender devices are in close proximity sooner than if it only provides a buffer zone around the victim's last reported location to the offender's device.

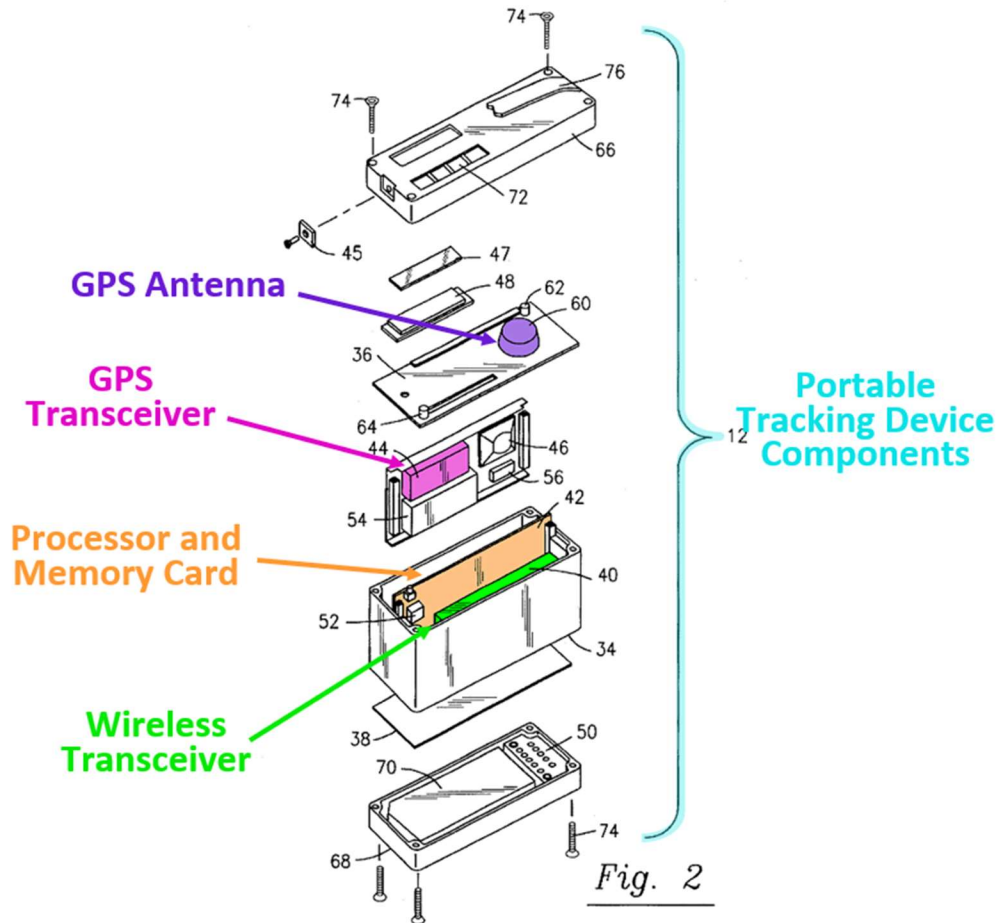
235. As explained for Element 1[E], below, these location constraints are used by the victim device in determining whether to transmit its location to the central database ("to disclose a global location at the network").

- f. Element 1[E]: means to provide the location of the portable mobile remote unit to the network upon determination that the portable mobile remote unit is within the geographic boundary obtained at the network;**

236. Layson’757-Layson’213-IllinoisLaw teaches Element 1[E].

237. Layson’757-Layson’213 teaches the claimed “means” under the construction proposed in Section VII.A.3, which is equivalent to “an antenna 20 and a transceiver circuitry 21” configured to transmit location information, together with a “control unit” programmed to determine that the unit is within the geographic boundary.

238. As illustrated in annotated Figure 2, below, each of Layson’757’s devices also includes a “processor and memory card 42” that “provides the execution environment for the algorithms to compare the current location obtained from the GPS receiver 44” against the “location constraints” provided by the central database (“network”). Ex-1007, 3:45-51.



239. As explained for Element 1[D], the location constraints provided to the victim’s portable tracking device include the offender location obtained at the network, together with a buffer zone around that location (“geographic boundary”). Ex-1007, 8:36-43.

240. The victim portable device’s processor and memory card 42 (Ex-1007, 3:45-51) “continuously processe[s]” these location constraints, enabling the device to notify the central database “immediately when a violation occurs”—i.e., when the victim portable tracking device is located within the buffer zone around the offender’s device. Ex-1007, 9:45-50. Thus, the victim device provides its location

to the central database at intervals when the offender and victim are in proximity, in the same way as described for the offender device in Element 15[B].

241. Notifying the central database of the violation would have entailed the victim's portable tracking device providing its current location to the central database, for use in dynamically updating the offender's location constraints (Ex-1007, 9:43-48). Such notification would be sent by the portable tracking device using transceiver 40, which, as explained for Element 1[D], enables two-way data communication between the device and the central location. Ex-1007, 3:36-38.

- g. Element 1[F]: means to determine and report to the system upon request that, another mobile remote unit of the network has tracked the portable mobile remote over a period of time.**

242. Layson'757-Layson'213-IllinoisLaw teaches Element 1[F].

243. Layson'757-Layson'213 teaches the claimed "means" under the construction proposed in Section VII.A.4, which is equivalent to a control unit programmed to: (1) receive, at intervals, the location of the "tracked" mobile unit, (2) receive the locations of "other" mobile units, during such intervals, and (3) maintain a list of such "other" units within a predefined geographic boundary of the "tracked" unit for a period of time as the tracked unit and such "other" units have moved a minimum distance, together with a transmitter configured to transmit a message identifying such "other" unit.

244. Layson’757’s “central data-base system” is a control unit of a network control center, because it “implements distributed and parallel processing in order to perform event processing for the multiple portable tracking apparatus in real-time.” Ex-1007, 7:35-39. As explained for Element 1[E], the central database receives the location of the victim portable tracking device (“tracked” unit) at intervals when an offender device is in proximity of the victim device. The central database also receives the locations of offender tracking devices (“other” mobile units) during such intervals, as explained for Element 15[B]. *See also* Element 15[B] (explaining that the locations of both the offender and victim devices may be obtained as part of “data fusion processing” (Ex-1007, 7:42-55), when the victim and offender devices are located in proximity to one another, during “a stalker-victim encounter[]” (Ex-1007, 8:50-56)).

245. Layson’757’s central database maintains a list of offender tracking devices (such “other” units) located within a buffer region surrounding the victim tracking device (i.e., within a predefined geographic boundary of the “tracked” unit) that provided their location at each interval. As illustrated in annotated Figure 7A, below, Layson’757 teaches both a “list of subjects” and storing the locations received from the portable tracking devices of those subjects. Ex-1007, Fig. 7A, 7:66-8:1 (similar).

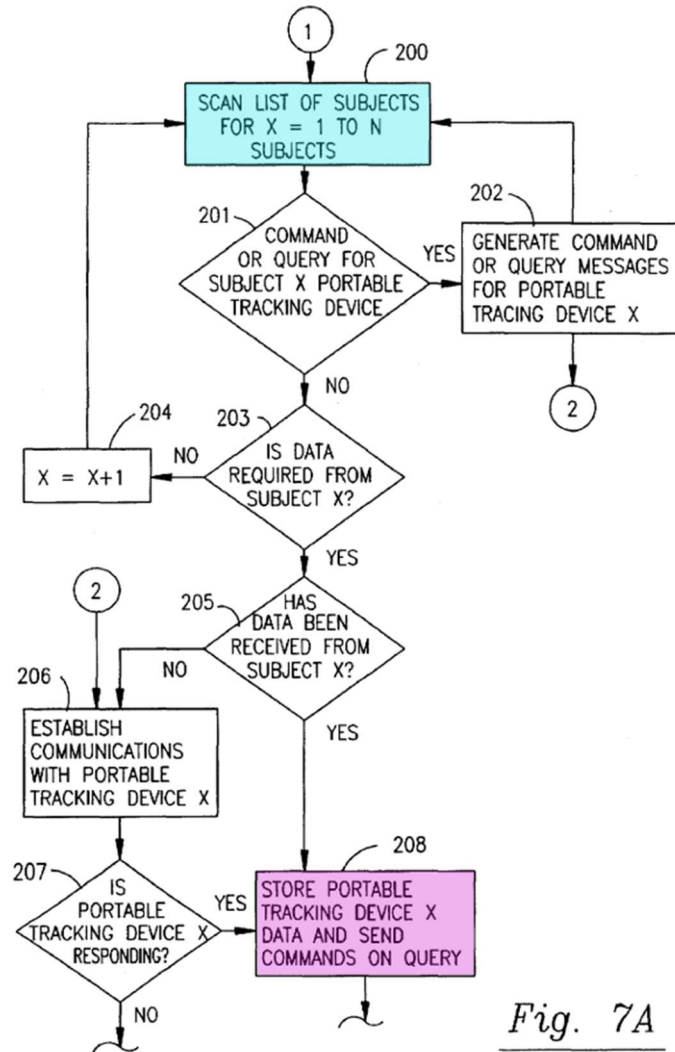


Fig. 7A

246. As explained in Section XIII.A.1, in the combined Layson’757-Layson’213 system, these stored locations would be provided to Layson’213’s correlation database for correlation and reporting purposes. Layson’213 teaches that its correlation database may receive “exclusion zone violations reported by [an] offender location monitoring system”—i.e., Layson’757’s central database—in real-time (Ex-1008, 18:35-40), for continuous processing, resulting in the generation of “a table report” of such violations (Ex-1008, 19:41-52):

The crime incident offender location correlation data base 1 is a real-time system that is continuously updated.... The updates can either be submitted in batch mode as known in the art or real-time as known in the art. Batch mode submittals, also known in the art as synchronous since they are synchronized with times of day or number of submittals per day, determine when automated correlation can occur since batch mode submittals will occur after the event (either crime incident or offender location recording) has taken place. **Real-time submittals**, also known in the art as asynchronous since they occur immediately with no predetermined scheduling, determine the need for tables of pending correlation since real-time submittal will occur as the event (either crime incident or offender location recording) is taking place.

Ex-1008, 18:17-40;

The automated crime incident/subject location correlation is an iterative process that continuously performs correlation as data from CAD 7, RMS 9, IMS 34 and offender location monitoring systems 220 is received by the crime incident offender location correlation data base 1. Each offender's data from an offender location monitoring system 220 is correlated against any violations of exclusion zone criteria 221 from offender sentencing data in IMS 34 and **exclusion zone violations reported by the offender location monitoring system 220. If exclusion zone violations are correlated 221 a table report is generated 222 for the law enforcement and/or corrections/community supervision agency(s).**

Ex-1008, 19:41-52. To provide evidence for use by "law enforcement" (Ex-1008, 19:50-52), such a report would at least include, at each time interval, the identities of any offenders in violation of the victim's buffer/exclusion zone, and the locations of those offenders. Ex-1008, 23:9-21 (data characterizing "exclusion zone violations"). One of a finite number of ways of storing such information would be as a list. Indeed, a POSITA would have understood that a "table," such as

Layson’213’s “table report,” corresponds to a set of lists. For instance, as I explained in the Background Section, lists of data may be generated from table(s) stored in a database, using a database query. *See* Section VIII.D *supra*. Accordingly, each column in a table may be considered to be a list (corresponding to the values of a given “field” in the table), and each row in a table may be considered to be a list (corresponding to the values of a given “record” stored in the table).

247. As explained in Section XIII.B.1, the central database may determine that such offender devices maintained close proximity to the victim device while the devices traveled a minimum distance threshold,¹⁴ for a period of time, to identify and report potential stalking behavior, thus performing the recited function.

248. Layson’757’s central database also includes a transmitter, to enable it to communicate “via the wireless communication link.” Ex-1007, 3:9-13. The central database uses such transmitter to report potential stalking behavior to the victim and law enforcement, in the same manner as explained for Element 15[D] for reporting buffer zone violations.

¹⁴ As noted in Section VII.A.4, if Patent Owner or the Board adopts a construction that does not require a “minimum distance” as part of the algorithm that performs the recited function, then Claim 1 is rendered obvious by the Layson’757-Layson’213 combination without the need to rely on IllinoisLaw. Layson’757-Layson’213 and its described “loiter time” teaches this element if the function can be performed using time-only based techniques.

3. Independent Claim 22

a. Element 22[pre]: A communication system comprising:

249. Layson’757-Layson’213-IllinoisLaw teaches the preamble of Claim 22, for the reasons explained for Element 1[pre].

b. Element 22[A]: (i) a network of communication units;

250. Layson’757-Layson’213-IllinoisLaw teaches Element 22[A], for the reasons explained for Element 1[A].

c. Element 22[B]: (ii) at least a first communication unit and at least a second communication unit able to provide location information to the network for a time while in motion;

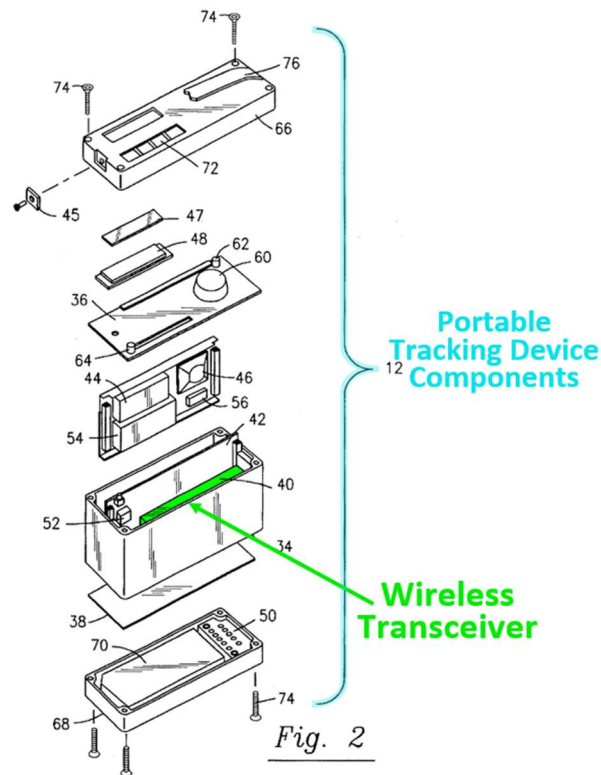
251. Layson’757’s victim portable tracking device is a first communication unit, and Layson’757’s offender portable tracking device is a second communication unit, as explained for Element 15[pre]. Layson’757’s portable tracking devices are in motion, as explained for Element 15[pre], and are able to provide their locations to the central database (“network”) for a time during such motion, as explained for Elements 15[A] (victim tracking device) and 15[B] (offender tracking device).

d. Element 22[C]: (iii) means to request whether the at least second communication unit is tracking the at least first communication unit;

252. Layson’757-Layson’213-IllinoisLaw teaches the claimed “means” under the construction proposed in Section VII.A.6, which is equivalent to either “antenna 20 and transceiver circuitry 21” configured to transmit tracking requests,

or “input panel 25” configured “to take user instructions” in the form of tracking requests.

253. **Request sent from Layson’757’s victim device:** As illustrated in annotated Figure 2, below, each of Layson’757’s portable tracking devices includes a “transceiver 40” that “provides two-way data and voice communications between the portable tracking device 12 and the central data-base system 22.” Ex-1007, 3:36-38.



254. As explained for Element 15[A], the victim portable tracking device uses transceiver 40 to provide its location to the central database. As explained for Element 22[D]-[E], below, such locations are used to determine and report to the

victim that the offender is tracking the victim. Accordingly, a POSITA would have understood that each transmission of location coordinates by the victim portable tracking device corresponds to a request for the central database to track any proximately-located offenders.

255. **Request sent from Layson’213’s query terminal:** In the Layson’757-Layson’213 system, a query terminal is used by a law enforcement personnel to submit queries of the location data stored by Layson’213’s correlation database (Ex-1008, 20:43), by entering criteria in response to prompts (Ex-1008, 21:36-58). A POSITA would have understood that the query terminal would include an input panel for entry of such criteria. As explained in Section XIII.B.1, for a victim who suspects that he/she is being stalked, Layson’213’s correlation database may be used to identify potential stalkers tracking the victim, by using a series of the victim’s locations as “crime incidents” in a central database query (Ex-1008, 21:37-39). Such a query corresponds to a tracking request.

- e. **Element 22[D]: (iv) means to determine from said location provided (ii) that the at least first and second communication unit maintained proximity while in motion during said time;**

256. Layson’757-Layson’213-IllinoisLaw teaches the claimed “means” under the construction proposed in Section VII.A.7, which is equivalent to a control unit programmed to: (1) receive, at intervals, the location of the at least first

communication unit, (2) receive the location of the at least second communication unit during such intervals, and (3) maintain a list of second communication unit(s) within a predefined geographic boundary of the at least first communication unit for a period of time as the at least first communication unit and the at least second communication unit(s) have moved a minimum distance.

257. **Layson’757’s central database:** Layson’757’s “central data-base system” is a control unit of a network control center, because it “implements distributed and parallel processing in order to perform event processing for the multiple portable tracking apparatus in real-time.” Ex-1007, 7:35-39. As explained for Elements 15[A]-[B], the central database receives the locations of the victim portable tracking device (“first communication unit”) and the offender portable tracking device (“second communication unit”) at intervals. As explained for Element 1[F], Layson’757’s central database maintains a list of offender tracking devices (“second communication unit”) located within a buffer region surrounding the victim tracking device (i.e., within a predefined geographic boundary of the first communication unit) that provided their location at each interval.¹⁵ As explained in

¹⁵ As noted in Section VII.A.7, to the extent that Patent Owner or the Board adopts a construction that does not require a “minimum distance” as part of the algorithm that performs the recited function, then Claim 22 is rendered obvious by the Layson’757-Layson’213 combination without the need to rely on IllinoisLaw. As shown by the relied upon evidence to this point in the analysis, Layson’757-

Section XIII.B.1, the central database may determine that such offender devices maintained close proximity to the victim device while the devices traveled a minimum distance threshold, for a period of time, to identify and report potential stalking behavior, thus performing the recited function.

258. **Layson’213’s correlation database:** Layson’213’s “correlation database” is a control unit, because it is “a real-time system” (Ex-1008, 18:17-18) that performs an iterative process to “continuously perform correlation” on data received from location monitoring systems (Ex-1008, 19:41-45). As explained in Section XIII.A.1, in the combined Layson’757-Layson’213 system, the reporting and correlating actions of Layson’213’s correlation database (Ex-1008, 19:41-20:27) would be performed on the locations of Layson’757’s portable tracking devices received at Layson’757’s central location (Ex-1007, 7:9-19).

259. As explained in Section XIII.B.1, a series of victim locations captured over a tracking time would be used in a correlation database query to identify those offenders who were located within a buffer distance of the victim over time (i.e., those offenders whose locations correlated with those of the victim, and thus who could potentially be stalking the victim). Ex-1008, 21:37-39 (explaining that a

Layson’213 and its described “loiter time” teaches this element if function can be performed using time-only based techniques. But, under the construction set out in Section VII.A.7, the IllinoisLaw teaching is brought in if the function also needs to include a minimum distance-based approach as well.

central database query may involve correlating “multiple crime incidents with offender(s) locations”). Such offenders would be included in Layson’213’s table reporting “suspect offenders,” generated in response to the database query. Ex-1008, 21:61-64. A POSITA would have understood that a table corresponds to a set of lists.

260. As explained in Section XIII.B.1, in the combined Layson’757-Layson’213-IllinoisLaw system, a POSITA would have been motivated to ensure that any offenders whose locations correlated over time with the victim’s location had traveled together with the victim as the victim “move[d] from place to place” to avoid false positives arising when an offender and victim are merely incidentally located in the same area over a period of time. Accordingly, a POSITA would have been motivated to implement a check for a minimum pre-specified distance of joint travel over a period of time (corresponding, for example, to the victim’s travel from work to home) to evaluate whether the offender “move[d] from place to place” with the victim over the period of time, crossing the line into criminal stalking. Ex-1010. Such incidents would then be included in Layson’213’s filtered table reporting “suspect offenders” (Ex-1008, 21:61-64) who may be stalking the victim.

f. Element 22[E]: (v) means to provide result of the determination (iv) to the requestor of (iii).

261. Layson’757-Layson’213-IllinoisLaw teaches the claimed “means” under the construction proposed in Section VII.A.8, which is equivalent to either a

transmitter configured to transmit the result of the determination to a device belonging to the requestor, or “display 23” configured to display the result of the determination to the requestor.

262. **Result received by Layson’757’s victim device:** Layson’757’s central database includes a transmitter, to enable it to communicate “via the wireless communication link.” Ex-1007, 3:9-13. The central database uses such transmitter to report potential stalking behavior to the victim and law enforcement, in the same manner as explained for Element 15[D] for reporting buffer zone violations.

263. **Request received by Layson’213’s query terminal:** As explained for Element 22[D], a query of Layson’213’s correlation database may be used to generate a report of suspect offenders who maintained proximity with the victim while in motion. Such report is provided “electronically” to the law enforcement requestor, using the query terminal. Ex-1008, 18:10-13. A POSITA would have understood that the query terminal would include a display, to display such report.

C. Ground 3: Claim 2 is rendered obvious by Layson’757-Layson’213-IllinoisLaw in view of Wang

1. A POSITA would have been motivated to combine Layson’757-Layson’213-IllinoisLaw with Wang with a reasonable expectation of success

264. As explained in Section XIII.A.1, a POSITA would have been motivated to combine Layson’757 with Layson’213 and would have had a reasonable expectation of success. First, Layson’213 incorporates Layson’757 by

reference (Ex-1008 2:28-30). Thus they are analogous art, and Layson'213 contains an explicit teaching to include Layson'757. Specifically, in the combined Layson'757-Layson'213 system, the reporting and correlating actions of Layson'213's correlation database (Ex-1008, 19:41-20:27) would be performed on the locations of Layson'57's portable tracking devices received at Layson'757's central location (Ex-1007, 7:9-19).

265. As explained in Section XIII.B.1, a POSITA would have been further motivated to combine Layson'757-Layson'213 with IllinoisLaw, to identify offender device(s) that maintained close proximity to a victim device while the devices traveled a minimum distance threshold, for a period of time, to identify and report potential stalking behavior.

266. A POSITA would have further been motivated to combine Layson'757-Layson'213-IllinoisLaw with Wang.

267. In Layson'757's tracking system, each portable tracking device is configured to compare its position to "location constraints [] sent from the central data-base system," and alert the central database in response to any violations of those constraints. Ex-1007, 9:45-50. Layson'757 explains that the constraints "define locations and a distance radius" around a location, and correspond to areas where the subject (victim or offender) "is allowed or not allowed." Ex-1007, 9:37-43. The location constraints may be static or dynamic (e.g., a buffer region around a

moving victim). Ex-1007, 9:35-41.

268. Wang similarly teaches a “tracking system” (Ex-1009, 1:2) in which each mobile unit can operate within defined “borders” provided by the network, as illustrated in annotated Figure 1. Ex-1009, 3:50-56.

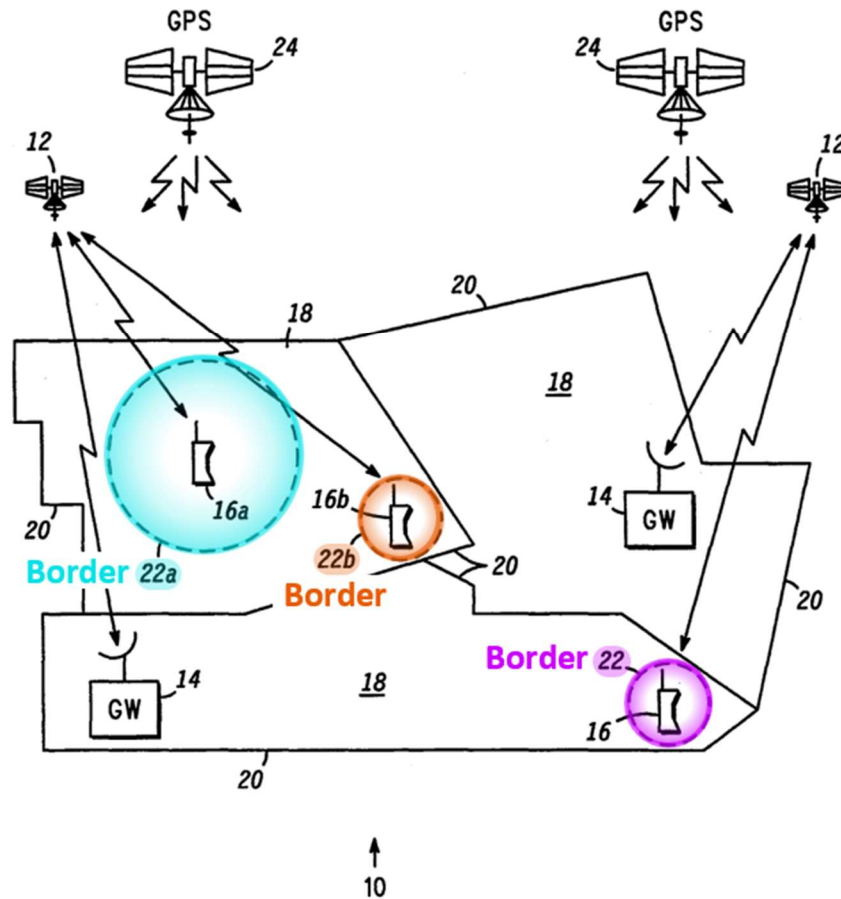


FIG. 1

269. When a mobile unit is located anywhere within its permissible border, it does not need to transmit its location to the network. Ex-1009, 3:56-58. In this manner, the borders may be used to reduce costs associated with existing communication systems, by reducing the consumption of “communication

resources” and battery power that would otherwise be associated with repeated location transmission:

The more accurate the location data, the better. More accurate data allow the network to better ascertain when mobile units cross from one jurisdiction into another. However, costs generally increase in proportion to the accuracy of the location data, and an intense need to keep costs as low as possible and revenues as high as possible exists. **One cost, which is of particular concern, is the amount of communication resources which are consumed in maintaining current location data.** As more resources are consumed in maintaining current location data, fewer resources are available for use by communication service subscribers and for generating revenues. In addition, mobile units are often battery operated, and **an excessive quantity of communications leads to an excessive use of available battery power.**

Ex-1009, 1:38-52 (describing costs associated with existing communication systems). “However, when the mobile unit 16 goes outside the border 22, it sends a new location communication to network 10” and is provided with a new border. Ex-1009, 3:58-61. Wang’s borders may take any shape (Ex-1009, 6:20-24) and are sized based on the network’s desired accuracy level for the associated mobile unit’s location (Ex-1009, 3:64-4:3). For instance, as illustrated above, Wang’s network need only know that mobile unit 16a is located *somewhere* within the region defined by border 22a, rather than its precise location. *Id.* In this manner, Wang teaches that its system may conserve communication resources. Ex-1009, 1:44-59.

270. **Wang’s Teachings Applied to the Offender Device:** A POSITA seeking to implement Layson’757’s location constraints would have recognized that,

when an offender is located within a static permitted region (e.g., the offender's home or workplace), as identified within the offender's location constraints, it would waste communication resources and battery power for the device to store its locations at intervals and then later upload those locations to the central database in a batch upload because all of the reported positions would be from the same location (e.g., the offender's home or workplace).

271. To avoid such waste of resources, a POSITA would have been motivated to modify Layson'757-Layson'213, based on Wang's teachings, such that Layson'757's portable monitoring devices do not store and/or report their locations to the central database when located within a permitted region (analogous to the region defined by Wang's border), as specified in the offender's location constraints.

272. Additionally, a POSITA would have recognized that, where an offender's location constraints include both static permitted regions (e.g., the offender's home or workplace) and dynamic prohibited regions (e.g., buffer region around a victim), the permitted and prohibited regions may sometimes overlap (e.g., a victim driving by an offender's home), and that notifying the authorities of the offender's presence in such an overlapping area would correspond to a false alarm. Layson'213, for example, provides an example of such a false alarm situation in which an offender is permitted to be present in a location (e.g., a "pedophile driving by a school on the way to work"), but is also in violation of an exclusion zone (e.g.,

the area around the school). Ex-1008, 23:33-38. Layson'213 explains that, in such scenario, the offender's presence in the exclusion zone should not be reported as a violation, "since passing through an exclusion zone is permitted but loitering is not." *Id.* For example, in the context of stalking, anti-stalking laws, such as that of Illinois, explicitly exempt the defendant's behavior while located within his/her home. Ex-1010, 0010 (defining "stalking" as occurring when a person "follows another person," but where "'follows another person' ***does not include*** a following ***within the residence of the defendant***").

273. To avoid such false alarms, a POSITA would have been motivated to modify Layson'757-Layson'213, based on Wang's teachings, such that Layson'757's portable monitoring devices do not provide their locations to the central database when located within a permitted region (analogous to the region defined by Wang's border), as specified in the offender's location constraints.

274. Notably, Layson'757 states that both the offender and victim would be assigned "location constraints." Ex-1007, 9:35-37. A POSITA would have recognized that, in order to protect the victim, the victim's location constraints would include static prohibited areas corresponding to the offender's allowed areas (e.g., the offender's home and work). In this manner, the victim device would alert the victim when he/she was located near the offender's home or work, even though the offender device is not configured to alert the system to such scenario. Indeed, a

POSITA would have recognized that configuring the victim's device to alert the victim and/or central database when the victim is near the offender's home or work, as opposed to configuring the offender device to do so, would further help to protect the victim, by not alerting the offender to the presence of a nearby victim of which the offender would otherwise likely be unaware.

275. Wang's Teachings Applied to the Victim Device: Similarly, a POSITA would have recognized that an offender's location constraints would include static regions associated with any corresponding victims (e.g., the victim's home or workplace), such that the offender's portable monitoring device will report violations of such locations (Ex-1007, 8:29-43), regardless of the victim's presence at those locations. Thus, for the victim portable tracking device, providing those static locations as permitted regions within which the victim's device does not need to store and report its location would both conserve communications resources and the device's battery power and help to protect the victim's privacy (*see, e.g.*, Ex-1039, 0012 (explaining that continuous monitoring "invades all aspects" of a subject's life)). Indeed, a POSITA would have recognized that protecting the victim's privacy was an important concern for any victim-offender tracking system. For instance, Taylor stresses the importance of "protect[ing] the privacy of the restrictor person which has not surrendered any of their rights." Ex-1011, 20:35-44.

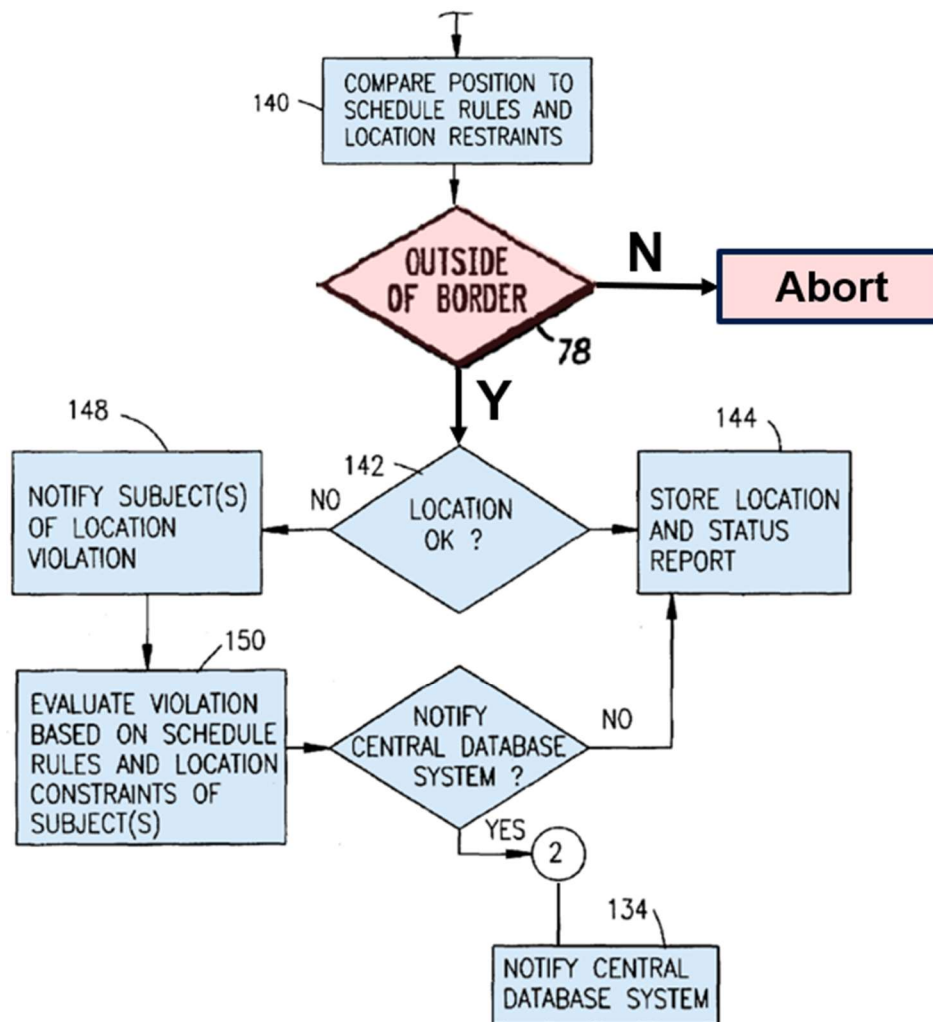
- 2. Dependent Claim 2: The portable mobile remote according to claim 1, having means to further determine if location disclosure for the remote unit is prohibited at a specific geographic boundary before sending its location to the network.**

276. Layson’757-Layson’213-IllinoisLaw-Wang teaches Claim 2.

277. Layson’757-Layson’213-IllinoisLaw-Wang teaches the claimed “means” under the construction proposed in Section VII.A.5, which is equivalent to a control unit programmed to: (1) compare its current location to an exclusion zone; (2) if its current location is within the exclusion zone, abort; (3) otherwise, proceed to provide its current location to the network.

278. Each of Layson’757’s portable monitoring devices includes a “control unit” that includes a processor and memory card. Layson’757 explains that each portable tracking device includes a “processor and memory card [that] provide[] the execution environment for the algorithms” used to compare the current location of the device to the “location constraints stored in the memory,” and to initiate transmission of “a data message to the central data-base system” in response to identifying a violation. Ex-1007, 3:45-60. In the combined Layson’757-Layson’213-IllinoisLaw-Wang system, Layson’757’s comparison step would be modified as illustrated below (combining aspects of Figures 6A and 6B of Layson’757, with step 78 of Wang’s Figure 6):

Layson'757 Modified By Wang



279. As illustrated above, in step 140, the victim's portable monitoring device compares its current location to location constraints received from the central database. As explained for Element 1[D], these location constraints would include a prohibited region in the form of a buffer region around an offender's location. And, as explained in Section XIII.C.1, these location constraints would also include allowed regions, in the form of the victim's home and work. In step 78, the device

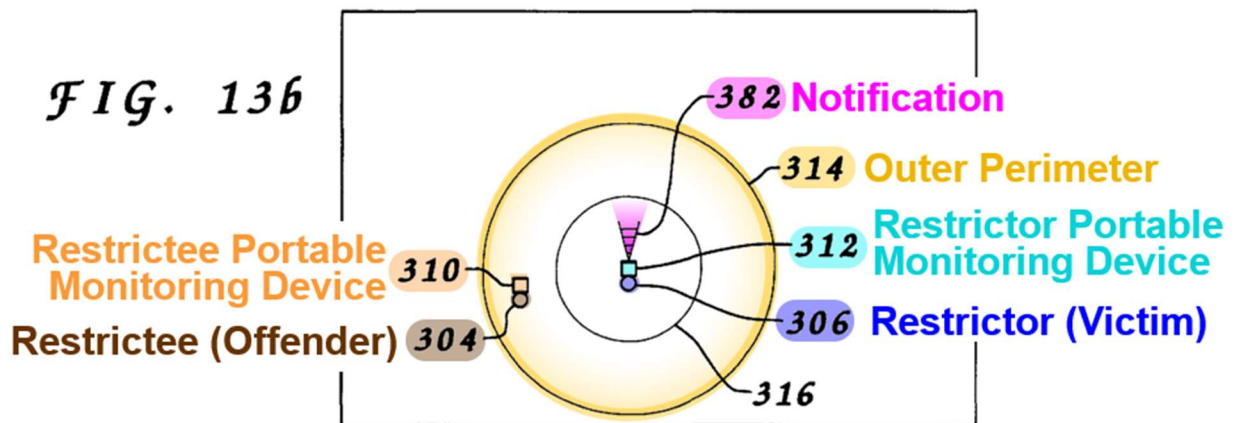
compares its location to its permitted regions in its location constraints (analogous to Wang's border, Ex-1009, 6:7-9) (claimed "exclusion zone"). If its current location is within a permitted region, the device does not store its location or send its location to the central database (abort in the above figure). If its current location is not within a permitted region, in step 142, the victim device determines if the device is located in a prohibited region (e.g., the offender's buffer region), and either immediately provides its location to the central database (step 134) in response to identifying a violation (through the device's reporting of the violation, as explained for Element 1[E]), or it stores its location for later batch upload to the central database (step 144). Each of Layson's 757's portable tracking devices, as modified by Wang, performs the recited function, each time it executes Layson's 757's algorithms, as modified by Wang.

D. Ground 4: Claim 15 is rendered obvious by Taylor-Fast

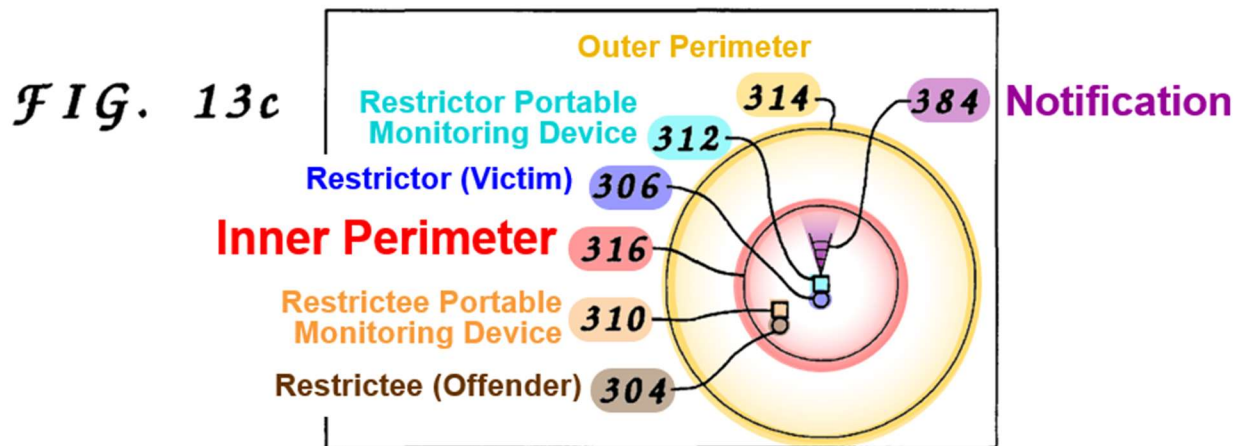
1. A POSITA would have been motivated to combine Taylor and Fast with a reasonable expectation of success

280. Taylor discloses a "tracking system" "to monitor the behavior of a first person, a restrictee person, relative to a second person, a restrictor person" (Ex-1011, 19:61-64), by assigning a portable monitoring device to each person (Ex-1011, 16:41-44). Taylor's system "is particularly expedient in the enforcement of court issued restraining orders" (Ex-1011, 20:5-7), where it may be used to protect a restrictor/victim from a restrictee/stalker by providing notifications to the restrictor

and/or “an oversight authority” when the restrictee person is nearby. Ex-1011, 20:16-24. Transmission of such notifications may be based on the position of the restrictee person (as obtained from the restrictee’s portable monitoring device) relative to one or more “perimeters” defined around the restrictor person. Ex-1011, 20:13-20:34. For instance, as illustrated in annotated Figure 13b below, when restrictee 304 is located within outer perimeter 314 around restrictor 306, the system sends notification 382 to restrictor portable monitoring device 312 to warn them of the restrictee’s proximity. Ex-1011, 21:4-7.



Additionally, when restrictee person 304 is located in even closer proximity, within inner perimeter 316, as illustrated in annotated Figure 13c below, the system escalates the response taken, by, for instance, sending notification 384 and also activating an additional intervention “to disable restrictee person 304.” Ex-1011, 16:57-60, 21:8-15 (distinct notification given).



281. Fast is in the same field as Taylor, disclosing a monitoring system that may be used in the context of “restraining order enforcement” to help maintain a set distance between a “threatened person” and a “threatening person.” Ex-1012, 7:36-8:7. Fast addresses this problem in a similar manner to Taylor, by assigning portable tracking devices (“beacons”) (Ex-1012, 7:62-67) to both the threatened person and the threatening person (Ex-1012, 7:62-63), which correspond to the restrictor and restrictee of Taylor.

282. In Fast's system, when "the two beacons [are] found to be too close together," an alarm is sent to both beacons and, if "greater separation distance [is] not provided within a predetermined time limit," the system triggers both beacons "into emergency mode allowing [a] supervising authority to track one or both parties." Ex-1012, 7:67-8:7. Thus, in response to detecting a restraining order violation, Fast teaches waiting a "predetermined time limit" to confirm the violation

is ongoing, before notifying a “supervising authority” of the violation. Put another way, Fast teaches that the violation is reported only if close proximity has been maintained for at least the “predetermined time limit.” A POSITA would have understood that Fast’s “predetermined time limit” (like the loitering time of Layson’213, discussed above) allows a threatening person to remedy an inadvertent violation of the threatened person/restrictor’s space, and helps to ensure that the system does not respond disproportionately to a brief, unintentional violation that does not pose an actual threat to the threatened person. A POSITA would have recognized that otherwise notifying the authorities and the threatened person/restrictor under such false-alarm circumstances would burden oversight authorities and create unnecessary stress on the restrictor. For example, in the context of home alarm systems, it was well-known that “false alarms present a serious threat to the effectiveness of police departments and to the safety of the communities they serve,” given the strain they place on police resources, and the “sense of complacency among officers” that they may breed. Ex-1053, 0002, 0005.

283. Indeed, as I explained in Section VIII.B.2.b, methods suitable for use in reducing such false-alarm scenarios were well-known in the prior art. For instance, U.S. Patent No. 5,266,944 (“Carroll”) discloses an offender-victim tracking system in which a device located with the victim is configured to receive an ID signal transmitted by the offender’s device, when the offender’s device is

nearby. Ex-1041, 14:3-30. In Carroll's system, "an appropriate test is [] performed" to verify that the receipt of a valid ID signal was not simply a false alarm. In particular:

If the receipt of a valid ID signal is confirmed (block 92), then an **appropriate test is next performed** to positively verify that a valid ID signal was actually received. Typically, this is done, as shown in FIG. 5, by waiting to receive a valid ID signal a second time (block 96). If the abuser is near the RMD, a second valid ID signal should be transmitted within the next 30-120 seconds. Thus, a time window is started after receipt of the first valid ID signal, and **if a valid ID signal is not received before the time window times out (block 98), e.g., within 3-4 minutes, then a false alert is logged** (block 100).

Ex-1041, 21:64-22:8. Thus, Carroll explains that it is the "receipt of a valid ID signal *over a prescribed period of time* provides sufficient evidence to establish probable cause that [a] protective order has or is being violated." Ex-1041, 14:3-6; *see also* Ex-1042, 16:2-7 (waiting a "grace period" before reporting a violation).

284. A POSITA would have been motivated to implement Fast's "predetermined time limit" in Taylor's monitoring system by waiting for Fast's "predetermined time limit" before notifying "an oversight authority" (Ex-1011, 20:17-20), in response to the restrictee's violation of one of the restrictor's perimeters, in case the violation was inadvertent. The combined Taylor-Fast system would include the record keeping and central location features of Taylor while obtaining the benefit of Fast's teachings; namely helping to ensure that the system does not respond disproportionately to a temporary/inadvertent violation.

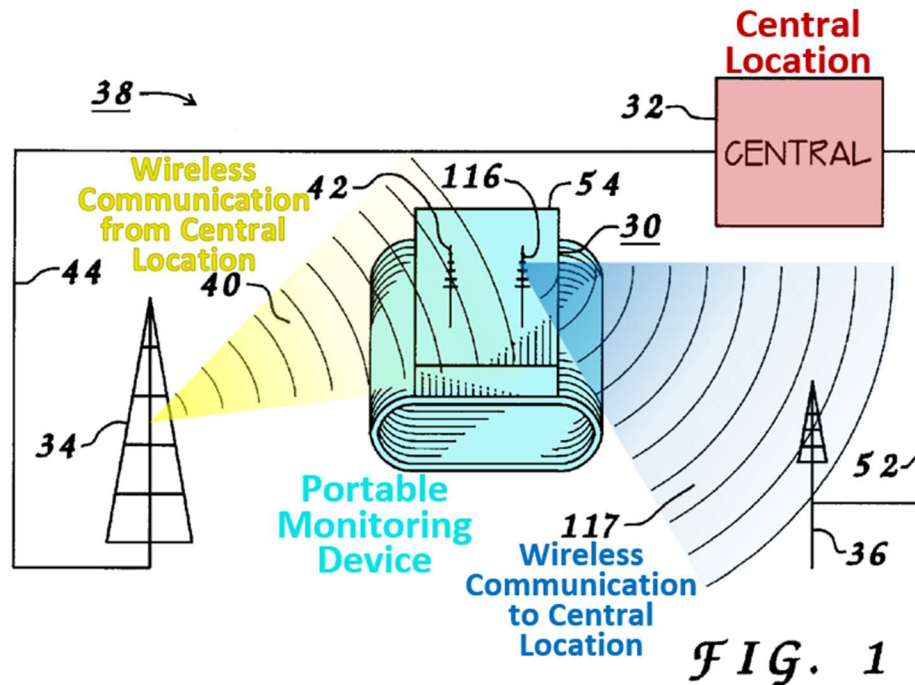
2. Independent Claim 15

- a. Element 15[pre]: A method for determining that a first portable remote unit of a wireless consumer associated with a network is being tracked by at least a second portable remote unit that is in motion with the first portable remote unit over a tracking period comprising;**

285. Taylor-Fast teaches the preamble of Claim 15, to the extent it is limiting.

286. **First and second portable remote units:** Taylor's restrictor portable monitoring device corresponds to the "first portable remote unit" and Taylor's restrictee portable monitoring device corresponds to the "second portable remote unit."

287. Taylor teaches a "restrictor" person (e.g., a potential victim) that seeks to be warned when one or more "restrictee" persons (e.g., a stalker subject to a restraining order) is located nearby. Ex-1011, 20:5-29, 20:2-4 ("multiple restrictee persons [may be] monitored relative to a single restrictor person"). To this end, both the restrictor and restrictee carry a "portable monitoring device" (Ex-1011, 20:58-62) configured to communicate with a central location (Ex-1011, 6:21-28). As illustrated in annotated Figure 1 below, this communication may occur wirelessly, using "conventional wireless communication systems" (Ex-1011, 6:34-40).



288. The restrictor is a wireless consumer of the wireless network, because he/she consumes wireless resources when using his/her device. This interpretation is consistent with the '918 Patent specification which describes a wireless consumer as simply a member of the general public that uses the wireless system. *See e.g.*, Ex-1001, 1:59-2:4.

289. The '918 Patent explains that its portable mobile remote units are capable of wireless communication (Ex-1001, 3:36-67), and are used to provide location information to the network, as the units are carried:

A PRU may be able to assist the network in determining its global location or use any location determination technique to resolve and provide its location to the network. **As a PRU is carried from one location to the other it may obtain and provide information concerning its current location to the network.**

Ex-1001, 5:11-16.

290. Each of Taylor's restrictee portable monitoring devices is also configured for wireless communication (Ex-1011, 6:21-28), and obtains and transmits information about its current position to the central location as the restrictee person moves (*id.*, 14:45-56).

291. Accordingly, each of Taylor's portable monitoring devices is a "portable mobile remote unit" of the same form as the '918 Patent's portable mobile remote units.

292. **Restrictor and restrictee devices are in motion:** Taylor's system is used to monitor the movement of the restrictee person relative to the restrictor person. Ex-1011, 19:62-64. This is done by defining perimeters around the restrictor, which "are variable and move with restrictor portable monitoring device 312 as restrictor person 306 carries it about." Ex-1011, 20:66-21:1.

293. As I will discuss further in the subsequent limitations of Claim 15, Taylor-Fast teaches a method by which Taylor's central location determines that the restrictor device is being tracked by the restrictee device over a tracking period, while the devices are in motion.

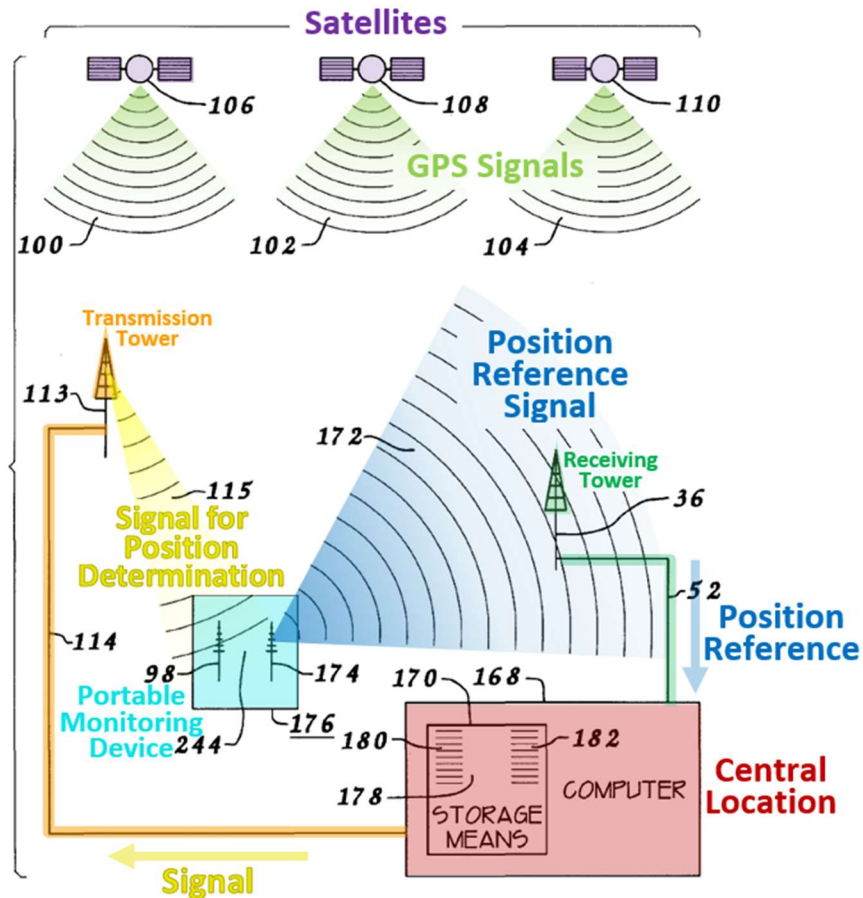
- b. Element 15[A]: i) obtaining the location information of the first portable mobile remote unit, said location information provided at intervals during said tracking period;**

294. Taylor-Fast teaches Element 15[A] through Taylor's restrictor device receiving position determination signals and providing its subsequently-determined position to the central location.

295. As explained for Element 15[pre], Taylor's restrictor portable monitoring device corresponds to the claimed first portable mobile remote unit.

296. Taylor teaches obtaining the location of the restrictor/wireless consumer using their portable monitoring device. "[E]ach portable monitoring device may routinely receive at least one signal ... [that] is then capable of, through a mathematical computation, being reduced to *a position reference* indicative of *a specific location*, within a predetermined range of measurement." Ex-1011, 14:9-14. These signal(s) used by the portable monitoring device to determine position may be transmitted from central location 168 (below, yellow) and/or GPS satellites (below, green), as illustrated in Figure 3, below:

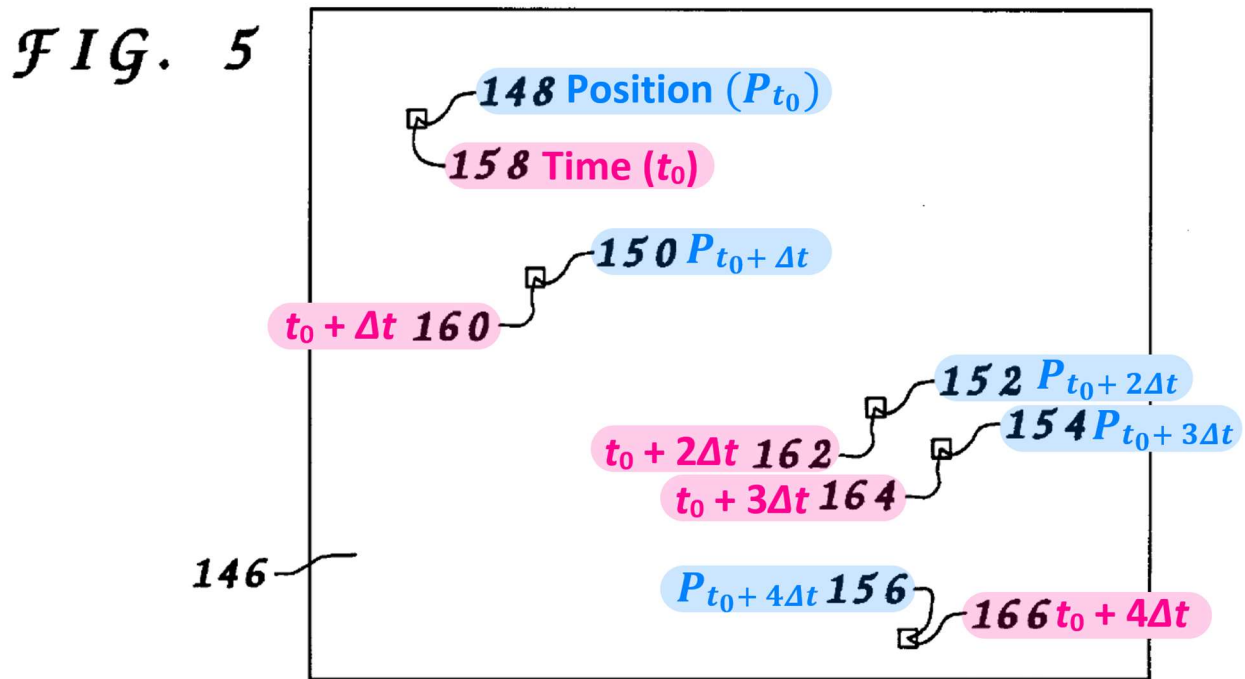
FIG. 3



Ex-1011, 9:40-49 (satellites and central location send positioning signals). After determining its position, each portable monitoring device may then “transfer signal 172 containing position reference 244” to the central location, where it is stored in database 182. Ex-1011, 14:53-56; *see also id.*, 14:14-23 (similar), 18:62-64 (similar).

297. Taylor’s portable monitoring devices are configured to generate position references at time “intervals during said tracking period.” For example, annotated Figure 5, presented below, illustrates a set of five position references for

a portable monitoring device, each obtained “a uniform measurement of time apart.” Ex-1011, 11:20-31. As shown in the figure (below, pink), the first measurement is taken at time t_0 , and subsequent measurements are taken at time intervals of Δt , a uniform measurement of time apart.



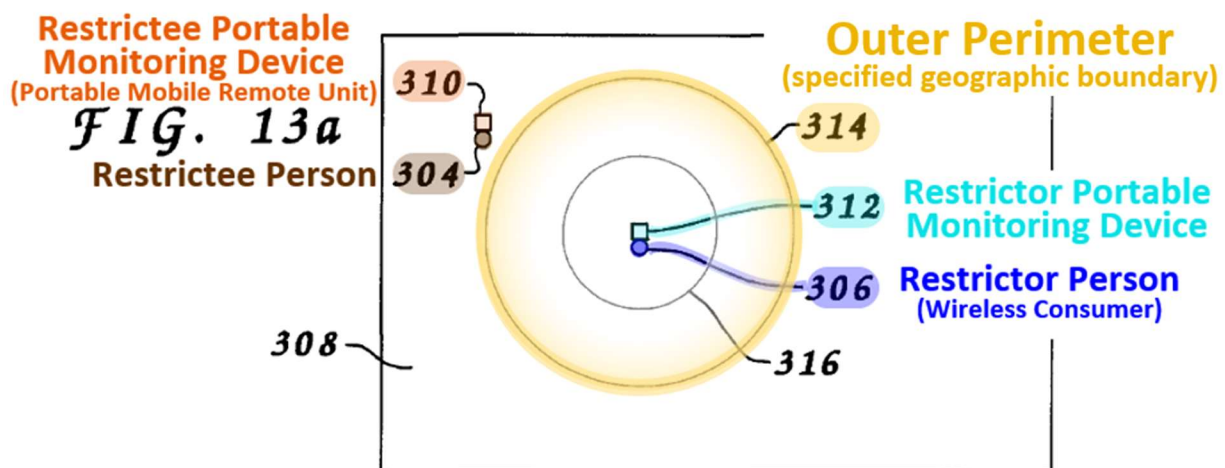
298. In the Taylor-Fast combination, the claimed “tracking period” would be used in conjunction with Fast’s “predetermined time limit” (Ex-1012, 7:65-8:7) before notifying Taylor’s “oversight authority” (Ex-1011, 20:17-20), in response to the restrictee’s violation of one of the restrictor’s perimeters. A POSITA would have understood that waiting Fast’s predetermined time limit would entail sampling both the restrictor’s and the restrictee’s positions over two or more intervals before alerting the authorities and the restrictor/victim.

- c. **Element 15[B]: ii) obtaining the location information of the at least second portable communication unit that is within a specified geographic boundary of the first portable remote unit, said location information provided at intervals during said tracking period;**

299. Taylor-Fast teaches Element 15[B].

300. Taylor's central location obtains the location information of the restrictee portable monitoring device, which is provided by the restrictee device, at intervals, when the device is located within a perimeter around the restrictor.

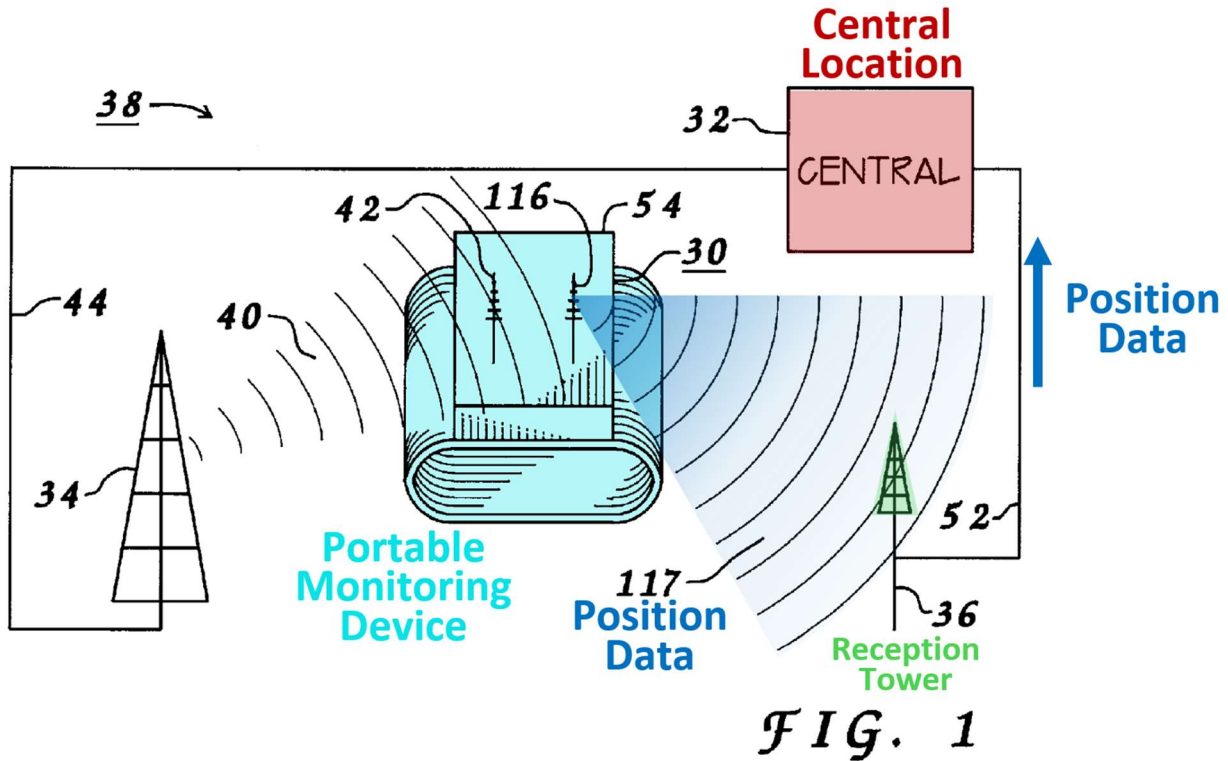
301. **Specified geographic boundary:** As explained for Element 15[pre], Taylor's restrictor portable monitoring device corresponds to the claimed first portable remote unit. Taylor teaches defining one or more perimeters (each a "specified geographic boundary") around a restrictor, as illustrated in annotated Figure 13, below, and notifying the restrictor when the restrictee enters within each perimeter. Ex-1011, 20:58-21:15.



302. **Obtaining the restrictee device's location at intervals:** As explained for Element 15[pre], Taylor's restrictee portable monitoring device corresponds to the claimed at least second portable communication unit.

303. In Taylor's system, both the restrictor and the restrictee portable monitoring devices provide location information by routinely receiving "at least one signal" that is then reduced to *a position reference* indicative of *a specific location*." Ex-1011, 14:9-14. The timing of each transmission of signal 40 corresponds to an "interval." Ex-1011, 11:20-31 ("a uniform measurement of time apart").

304. Upon receiving signal 40, Taylor's restrictee portable monitoring device will determine its position (Ex-1011, 5:63-6:13, 14:10-18 (similar)), and then "immediately transfer" it (Ex-1011, 10:5-7) to the central location (Ex-1011, 9:7-9), as illustrated in annotated Figure 1 below:



305. In Taylor, signal 40 corresponds to a request for all restrictee devices capable of receiving the signal to disclose their locations, whereas in Fast only victim/offender devices in close proximity disclose their locations to the central authority. Fast teaches that a beacon assigned to the threatened person and a beacon assigned to the threatening person “phone” one another to request their respective positions, to determine whether the beacons were “too close together ... indicating that a potential violation had occurred.” Ex-1012, 7:65-8:3. Thus, the two Fast beacons determine when they are in close proximity and report this information to a central authority if greater separation distance is not provided “within a predetermined time limit” or grace period. Ex-1012, 8:3-7.

306. One of skill in the art would have been motivated to include these teachings in Taylor. Taylor teaches an embodiment in which its portable monitoring devices transmit their location information to the central location in batches. Ex-1011, 10:5-13. Taylor also teaches that the devices may evaluate locally whether they are in prohibited or allowed areas. Ex-1011, 17:33-41 (“positional conditional database” defining “allowable” and/or “excluded” areas), 18:40-45 (portable device may store a copy of the positional conditional database for local use). In response to locally identifying that it is located within an excluded region, Taylor’s device reports this violation in real-time to the central location. Ex-1011, 19:8-17.

307. In the Taylor-Fast combined system, the restrictor and restrictee devices may report their location in batches under non-violation circumstances, but would communicate information needed to identify dynamic perimeter violations (as taught by Fast), and report any identified violations in real-time to the central station location (as taught by Taylor). Reporting identified violations would have involved transmitting their locations to the central location, so that those locations could be used as evidence “during a subsequent legal proceeding.” Ex-1011, 20:38-55 (“[I]t is possible to store the applicable position references of the restrictor person only when the restrictee person is with[in] a predetermined distance measurement of the restrictee person.... The restrictee person’s position references can similarly be stored.”); Ex-1012, 8:3-7 (explaining that, when the beacons are too close to one

another, they are “triggered into emergency mode allowing the supervising authority **to track** one or both the parties”). Thus, in the Taylor-Fast combined system, the central location’s transmission of signal 40 causes a restrictee portable monitoring device either to transmit its position (determined using signal 40) to the central location in response to identifying a violation, or store its position for later batch transmission. Where the only mobile units in close proximity to the restrictor are corresponding restrictee devices, each transmission of signal 40 by central location thus corresponds to a request, at a given time interval, at the network (central location), that all mobile remote units (restrictee portable monitoring devices) disclose their location to the network if they are in close proximity to the wireless consumer (in violation of a restrictor’s perimeter).

d. Element 15[C]: iii) using the location obtained according to step (i) and (ii) to verify whether the first portable remote unit and second portable remote unit have maintained relative proximity during the tracking period;

308. Taylor-Fast teaches Element 15[C].

309. Taylor’s restrictor and restrictee devices are located in proximity to one another when the restrictee device is located within the restrictor’s perimeter. Ex-1011, 21:4-7, 20:16-18 (similar). Because the restrictor and restrictee devices are in motion, as explained for Element 15[pre], verifying that the devices “have maintained relative proximity during the tracking period” corresponds to

determining that the restrictee device remained located within the restrictor's perimeter at each interval during the tracking period. This is taught by Taylor-Fast, as explained below.

310. As explained in Section XIII.D.1 (motivation to combine Taylor and Fast), in response to detecting a restraining order violation, Fast teaches waiting a “predetermined time limit” (or grace period) to confirm the violation is ongoing, before notifying a “supervising authority” of the violation. Ex-1012, 7:67-8:7. A POSITA would have been motivated to implement Fast's “predetermined time limit” in Taylor's system by configuring Taylor's central location to wait before notifying “an oversight authority” (Ex-1011, 20:16-19) of the restrictee person's violation until after determining that the violation continued over Fast's predetermined time limit, indicating that the restrictee person may pose an actual threat to the restrictor person.

311. Indeed, as I explained in Section VIII.B.2.b, it was well-known in the context of offender-victim tracking to wait a prescribed time prior to alerting the victim and/or the authorities to an offender's violation, to prevent false positives. *See, e.g.*, Ex-1041, 21:64-22:8 (waiting “a time window” to confirm a detected violation); Ex-1042, 16:2-7 (waiting a “grace period” before reporting a violation); Ex-1008, 23:33-36 (identifying an offender's presence within a prohibited zone as a violation, when it extends over a “loiter time”).

312. As explained above with respect to Element 15[A] (“intervals during said tracking period”), Fast’s predetermined time limit would have been chosen to cover two or more intervals over which the restrictor’s and restrictee’s locations are reported. This would help to ensure that the time over which the restrictee maintained close proximity to the restrictor is sufficient to qualify as an actual violation of the restrictor’s perimeter, as opposed to a transient and inadvertent violation. Accordingly, Fast’s predetermined time limit would correspond to a “tracking period.”

e. Element 15[D]: iv) forwarding the result of the verification to a network requestor at the end of the tracking period.

313. Taylor teaches Element 15[D].

314. Taylor teaches notifying the “an oversight authority” or the restrictor person in response to identifying a perimeter violation. Ex-1011, 20:17-20. As explained in Element 15[C], a POSITA would have been motivated to wait to ensure that the violation was maintained over Fast’s “predetermined time limit” (the tracking period), before sending the notification.

315. Both Taylor’s restrictor and oversight authority correspond to a “network requestor.” A POSITA would have understood that Taylor’s central location tracks proximately-located restrictees and alerts the restrictor to their presence at the restrictor’s request, based on the restrictor’s voluntary enrollment in

the monitoring system and transmission of their location coordinates to the central location. Similarly, a POSITA would have understood that Taylor's central location notifies the oversight authority of violations at its request, based on its use of Taylor's system.

E. Ground 5: Claims 1, 2, and 22 are obvious over Taylor-Fast-IllinoisLaw

1. A POSITA would have been motivated to combine Taylor-Fast-IllinoisLaw with a reasonable expectation of success

316. As explained in Section XIII.D.1, a POSITA would have been motivated to combine Taylor-Fast.

317. A POSITA would have been motivated to further combine Taylor-Fast with IllinoisLaw.

318. Taylor teaches that its monitoring system "is particularly expedient in the enforcement of court issued restraining orders," where it may be used to protect a restrictor person (e.g., a victim) from a restrictee person (e.g., a stalker subject to the restraining order). Ex-1011, 20:5-7. As explained in Section XIII.D.1, a POSITA would have been motivated to help ensure that a restrictee's presence within one of the restrictor's perimeters corresponds to an actual threat, before issuing a notification, such as by waiting Fast's "predetermined time limit" (Ex-1012, 7:67-8:7) before notifying an oversight authority (Ex-1011, 20:17-20) of a restraining order violation, in case the violation was inadvertent.

319. A POSITA would have recognized that certain other behaviors, such as stalking, can be indicative of intentional restraining order violations, even when an offender/restrictee maintains the minimum separation distance from the victim/restrictor specified in the restraining order. *See, e.g.*, Ex-1007, 8:50-56; Ex-1035, 4:36-53. Moreover, a POSITA would understand that stalking includes following and maintaining surveillance of a victim. *See, e.g.*, Ex-1055, 0001. In order to identify both types of restraining order violations—i.e., approaching the victim within the minimum separation distance specified by the restraining order, and stalking the victim—a POSITA would have been motivated to implement at least two of Taylor’s perimeters around the victim/restrictor (Ex-1011, 20:13-34)—(1) an inner perimeter corresponding to the minimum separation distance specified in the restraining order, for use in detecting violations of such separation distance, and (2) a larger outer perimeter, for use in detecting stalking.

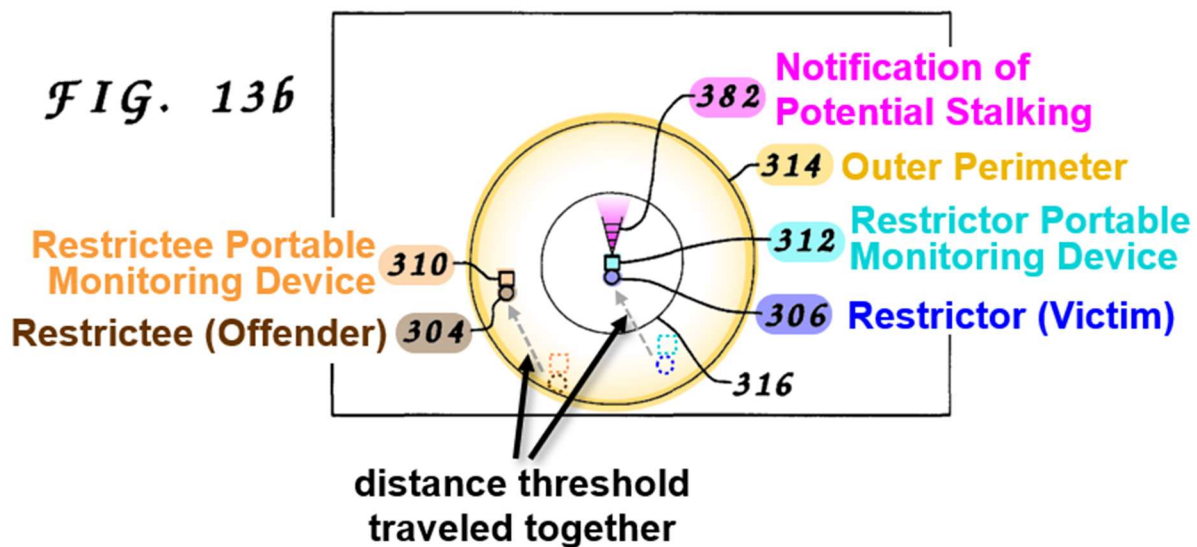
320. Indeed, as explained in Section XIII.B.1, a POSITA would have been motivated to design an offender-victim tracking system for the purpose of detecting potential stalking scenarios, given both the public’s and the government’s interest in protecting against stalking during the 1990s.

321. As explained in Section XIII.B.1, to detect such stalking, a POSITA would have been motivated to implement a system that addresses the legally-defined characteristics of stalking. To do so, a POSITA would have been motivated to turn

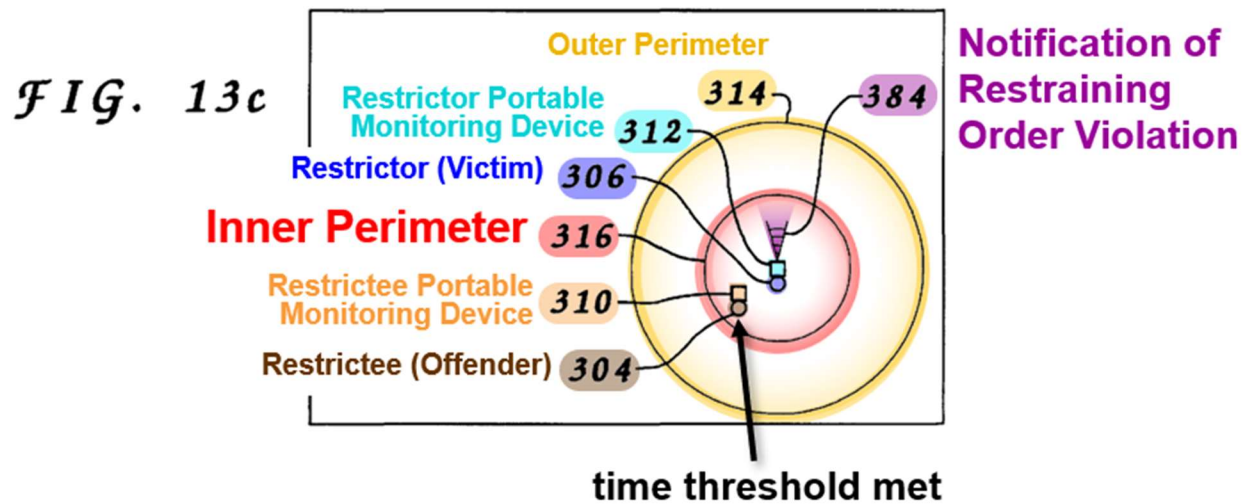
to stalking laws, such as IllinoisLaw, which prohibits behavior such as following and maintaining surveillance of a victim, as the victim “move[s] from place to place.” Ex-1010, 0009-0010. A POSITA seeking to use the Taylor-Fast combined system to address the crime of stalking would thus have been motivated to design a system that would address following as the victim “move[s] from place to place,” as taught by IllinoisLaw, as well as maintaining close proximity, as taught by Taylor-Fast. To capture such movement “from place to place,” a POSITA would have included a distance threshold, because following for a *short* distance might be incidental and innocent. *See, e.g.*, Ex-1037, 0011 (characterizing stalking as involving following for a “prolonged distance”). In addition, while a following event may be coincidental and innocent, in the event it is not, reporting and forwarding such occurrences would have been recognized as useful for subsequent use as “evidence during a legal proceeding.” Ex-1011, 18:38-41.

322. Thus, in the combined Taylor-Fast-IllinoisLaw system, two perimeters would be implemented around a victim/restrictor, and the locations of the victim/restrictor and offender/restrictor would be reported to Taylor’s central location, at intervals, when the restrictor entered within the victim’s outer perimeter (and would continue to be reported to the central location when the restrictor moved into the victim’s inner perimeter). When the restrictor device is located within the restrictor’s outer perimeter, but outside of the restrictor’s inner perimeter, Taylor’s

central location will use the reported locations to determine whether the restrictee may be stalking the restrictor. In particular, in response to determining that the restrictee device maintained proximity to the restrictor device, while both devices traveled a distance threshold (to capture IllinoisLaw’s following “from place to place” concept), as illustrated in annotated Figure 13b below, Taylor’s central location will report to the restrictor and/or law enforcement, that the restrictee is potentially stalking the restrictor.



323. When the restrictee device crosses the inner perimeter around the restrictor device, the central location will report this violation to the victim and/or law enforcement, if the restrictee device remains within the inner perimeter for a minimum time threshold, as taught by Taylor-Fast, and explained for Ground 4. This situation is illustrated below, in annotated Figure 13c.



2. Independent Claim 1

a. Element 1[pre]: A communication system comprising:

324. Taylor-Fast teaches the preamble of Claim 1, to the extent it is limiting. The “mobile location reporting communication system consists of a network of communication sources and targets managed by one or more control stations.” Ex-1001, Abstract.

325. Taylor discloses a communication system in the form of a “monitoring system 38” (Ex-1011, 5:32-34) “for monitoring a plurality of monitored persons” (*id.*, 2:34-37). As illustrated in annotated Figure 1 below, Taylor’s monitoring system 38 includes “a portable monitoring device [30] for each of the monitored persons” (*id.*, 2:37-39) together with a “central location 32” (*id.*, 5:32-34), which is a “control station.” See *id.*, 5:55-65 (“Supervisory personnel, not shown, would have access to exert control over, or otherwise interface with, monitoring system 38 at

central location 32.”).

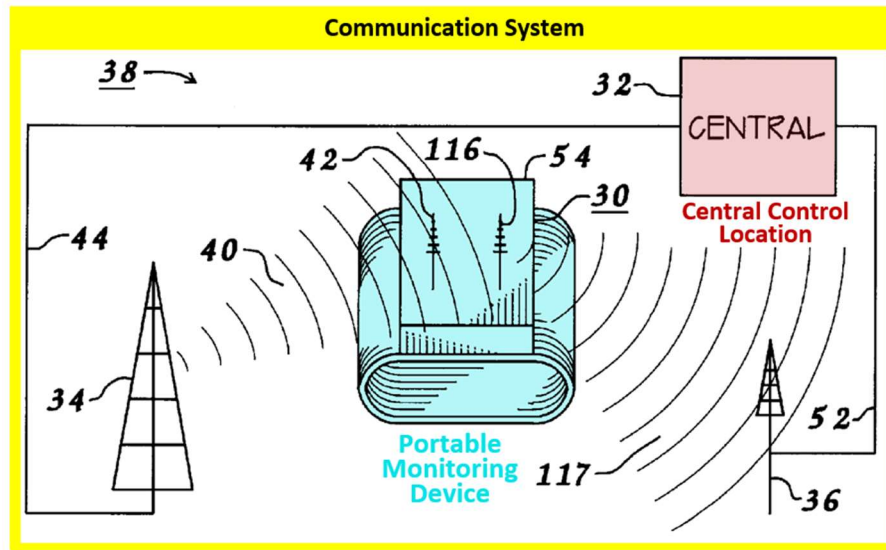
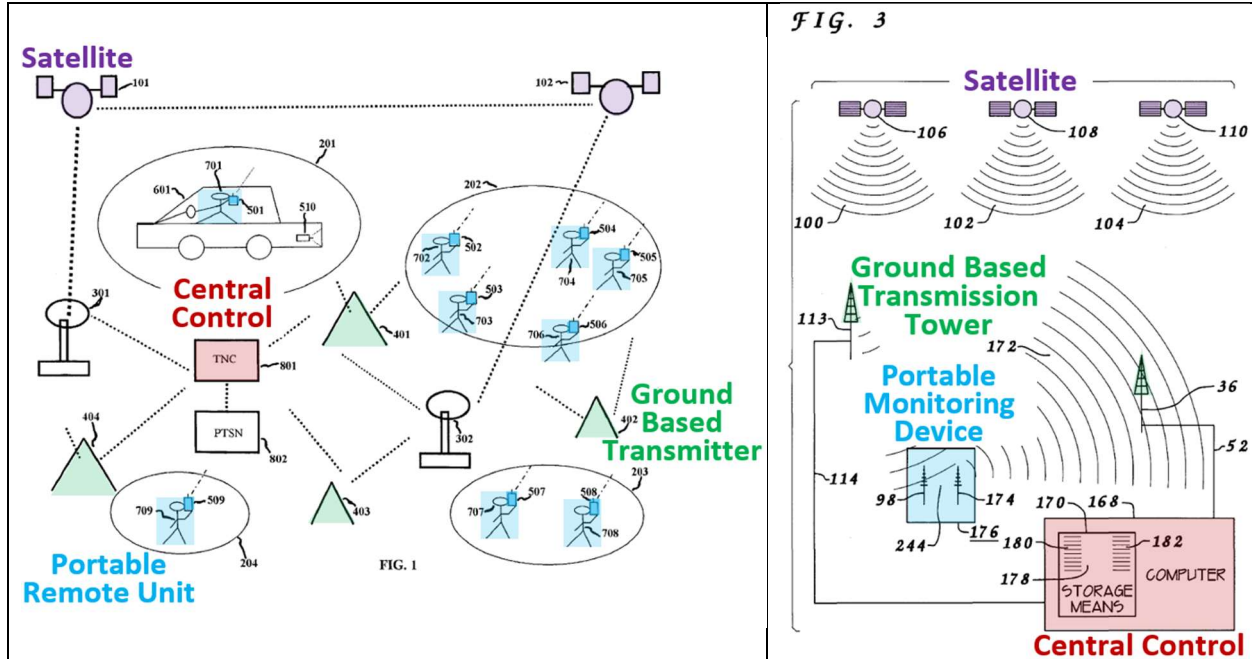


FIG. 1

326. Indeed, Taylor’s “monitoring system” is of the same form as the ’918 Patent’s “communication system,” as illustrated by the below comparison between Figure 3 of Taylor, and Figure 1 of the ’918 Patent.

'752 Patent, Figure 1 (annotated)	Taylor, Figure 3 (annotated)
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b. Element 1[A]: a portable mobile remote unit;

327. Taylor-Fast-IllinoisLaw teaches Element 1[A].

328. Taylor’s restrictor portable tracking device is a portable mobile remote unit, because it obtains and transmits position information to the central location as the monitored person moves (*id.*, 14:45-56), as explained for Element 15[pre].

c. Element 1[B]: a network of communication units;

329. Taylor-Fast-IllinoisLaw teaches Element 1[B].

330. Each of Taylor’s portable monitoring devices is a “communication unit” because it is capable of sending and receiving communications. *See, e.g.*, Ex-1011, 9:20-22 (device includes a “reception antenna”), 10:18-20 (device includes “a transmit antenna”).

331. Taylor’s system includes a network of portable monitoring devices, because it “monitor[s] the behavior of a first person, a restrictee person, relative to a second person, a restrictor person” (Ex-1011, 19:61-64), with each restrictee/restrictor assigned a portable monitoring device (*id.*, 20:58-62). Moreover, “a single restrictee person [may be] monitored relative to a plurality of restrictor persons” and/or “multiple restrictee persons [may be] monitored relative to a single restrictor person.” *Id.*, 20:1-4.

332. The restrictor/restrictee portable monitoring devices form “a network of communication units,” because each device is communicatively connected to the central location. Ex-1011, 6:21-23 (“It is a requirement that the central location(s) be capable of communicating with respective portable monitoring devices.... either from the central location to respective portable monitoring devices, from respective portable monitoring devices to the central location or both.”). In particular, a POSITA would have recognized this configuration—i.e., a set of devices configured to communicative with a central control location—as corresponding to a “hub-and-spoke” communications network. Ex-1049, 0004; Ex-1050, 0026. In the combined Taylor-Fast system, the portable devices are also able to communicate directly with one another (Ex-1012, 7:62-8:7), over Taylor’s cellular network (Ex-1011, 10:3-4; Ex-1012, 2:54-55).

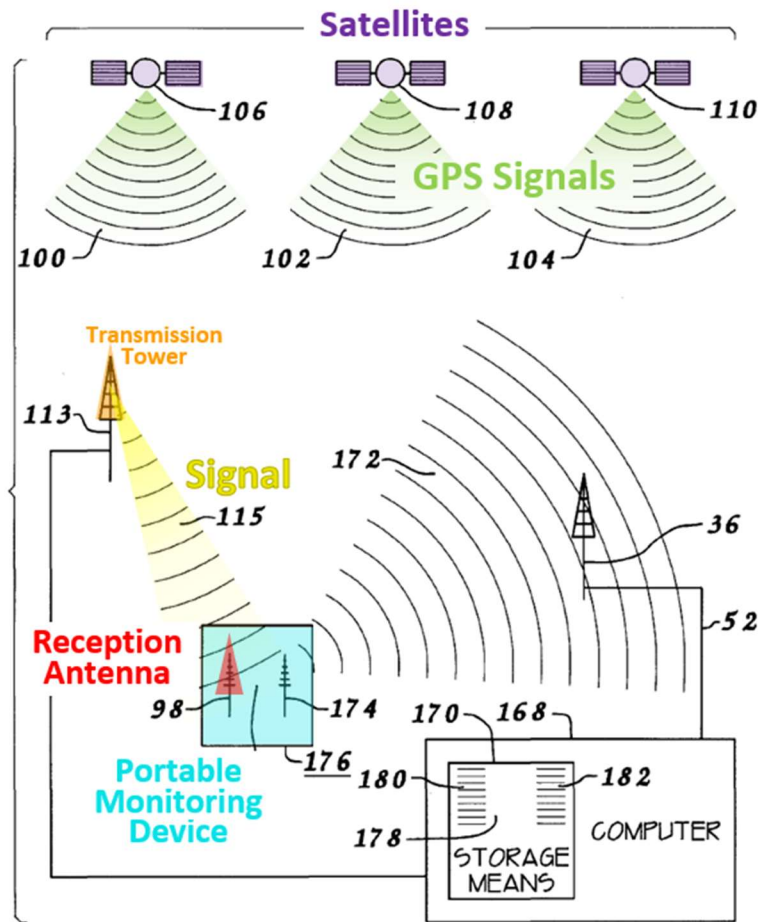
d. Element 1[C]: means to obtain the location of the portable mobile remote unit;

333. Taylor-Fast-IllinoisLaw teaches Element 1[C].

334. Taylor teaches the claimed “means” under the construction proposed in Section VII.A.1, which is equivalent to “an antenna 20 and a transceiver 21” configured to receive signals, together with a “control unit” programmed to use such signals to determine location.

335. As illustrated in annotated Figure 3, below, each portable monitoring device includes a “reception antenna 98” that is capable of receiving GPS signals and/or signal 115. Ex-1011, 9:40-48.

FIG. 3



336. As Taylor explains, “a device located within the portable monitoring device” may be programmed to perform a “mathematical computation” to reduce these received signal(s) to “a position reference indicative of a specific location....” Ex-1011, 14:8-18, 14:45-56 (similar). Thus, each of portable monitoring devices perform the recited function of obtaining its location.

- e. **Element 1[D]: means to obtain geographic boundary information in order to disclose a global location at the network;**

337. Taylor-Fast-IllinoisLaw teaches Element 1[D].

338. Taylor-Fast-IllinoisLaw teaches the claimed “means” under the construction proposed in Section VII.A.2, which is equivalent to “an antenna 20 and a transceiver circuitry 21” configured to receive signals that include geographic boundary information.

339. As explained for Element 1[C], each of Taylor’s portable monitoring devices includes a “reception antenna 98.” Ex-1011, 9:41-44. As explained for Element 15[B], in the Taylor-Fast combined system, Taylor’s restrictor and restrictee devices would communicate geographic boundary information needed to identify dynamic perimeter violations to one another (as taught by Fast (Ex-1012, 7:65-8:3)), in order to report any identified violation in real-time to the central location (as taught by Taylor (Ex-1011, 19:8-17)). Such geographic boundary information would include the device’s current location, and one or more radii, corresponding to Taylor’s perimeter(s).¹⁶ Thus, each portable monitoring device

¹⁶ This radii information could be sent together with the restrictor/restrictor device’s current location, for use by the restrictor/restrictor device as the geographic boundary information, or it could be sent separately (e.g., by the central location during enrollment of the device in the tracking system) and stored on the device for use with the received locations.

performs the recited function of obtaining geographic boundary information. As explained for Element 1[E], below, this geographic boundary information is used by the restrictee device in determining whether to transmit its location to the central location (“to disclose a global location at the network”).

- f. Element 1[E]: means to provide the location of the portable mobile remote unit to the network upon determination that the portable mobile remote unit is within the geographic boundary obtained at the network;**

340. Taylor-Fast-IllinoisLaw teaches Element 1[E].

341. Taylor-Fast-IllinoisLaw teaches the claimed “means” under the construction proposed in Section VII.A.3, which is equivalent to “an antenna 20 and a transceiver circuitry 21” configured to transmit location information, together with a “control unit” programmed to determine that the unit is within the geographic boundary.

342. Fast teaches that each of its “beacons” includes “a microprocessor and a memory for storing programs to be executed by said microprocessor.” Ex-1012, Cl. 1. As explained for Element 15[B], in the Taylor-Fast combined system, Taylor’s restrictor and restrictee devices may report their location to Taylor’s central location in batches under non-violation circumstances, but would communicate their locations to one another, as geographic boundary information needed to identify

dynamic perimeter violations,¹⁷ and then report any identified perimeter violations in real-time to the central location. As explained for Element 15[B], reporting such perimeter violations to the central location would involve sending their locations to the central location.

343. Taylor teaches that each portable monitoring device includes a “transmitting antenna 116” for transmitting signals to the central location (Ex-1011, 10:18-22), such as location as part of reporting identified violations to the central location. Reporting such violations would involve transmitting the device’s location to the central location, thus performing the means of providing the portable monitoring device location to the network.

g. Element 1[F]: means to determine and report to the system upon request that, another mobile remote unit of the network has tracked the portable mobile remote unit over a period of time.

344. Taylor-Fast-IllinoisLaw teaches Element 1[F].

345. Taylor-Fast-IllinoisLaw teaches the claimed “means” under the construction proposed in Section VII.A.4, which is equivalent to a control unit

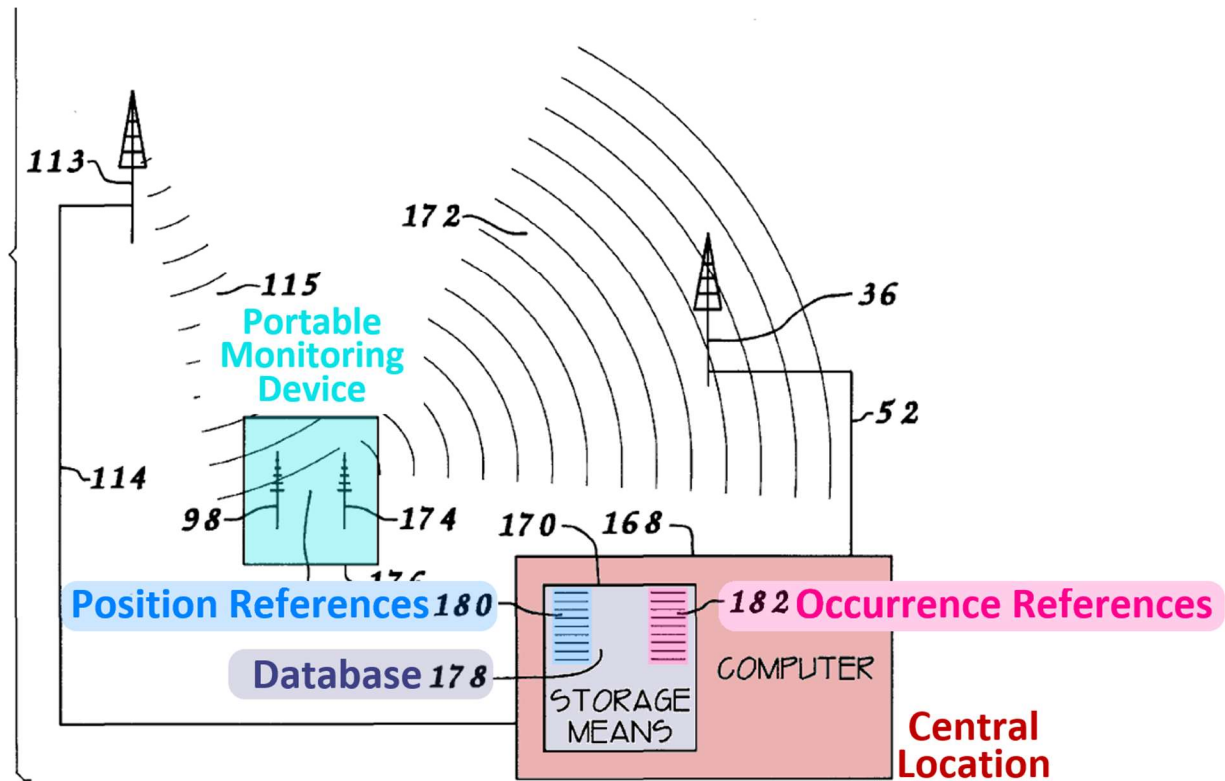
¹⁷ As explained for Element 1[D], such geographic boundary information would include the device’s current location, and one or more radii, corresponding to Taylor’s perimeter(s). This radii information could be sent together with the restrictor/restrictor device’s current location, for use by the restrictor/restrictor device as the geographic boundary information, or it could be sent separately (e.g., by the central location during enrollment of the device in the tracking system) and stored on the device for use with the received locations.

programmed to: (1) receive, at intervals, the location of the “tracked” mobile unit, (2) receive the locations of “other” mobile units, during such intervals, and (3) maintain a list of such “other” units within a predefined geographic boundary of the “tracked” unit for a period of time as the tracked unit moves, together with a transmitter configured to transmit a message identifying such “other” unit.

346. Taylor’s central location includes a control unit of a network control center, because it is configured to “perform computational calculations” on information received from portable monitoring units. Ex-1011, 5:42-46. As explained for Element 1[E], the central location receives the location of the restrictor portable tracking device (“tracked” unit). These locations are transmitted over intervals, as explained for Element 15[A], while the restrictor and restrictee devices are in proximity. The central location also receives the locations of restrictee portable tracking devices (“other” mobile units) during such intervals, as explained for Element 15[B].

347. Taylor’s central location maintains a list of restrictee monitoring devices (such “other” units) located within a perimeter around the restrictor monitoring device (i.e., within a predefined geographic boundary of the “tracked” unit) that provided their location at each interval. Taylor teaches maintaining the position references, along with associated time-of-occurrence references, received from the portable tracking devices, as lists in a database (storage means 170), as

illustrated in excerpted and annotated Figure 3:



348. As I explained in the Background Section, a POSITA would have understood that, conceptually, a database is a set of related lists. *See* Section VIII.D *supra*; *see also* Section XIII.B.2.f *supra*.

349. As explained in Section XIII.E.1, the central location may determine that such restrictee devices maintained close proximity to the restrictor device while the devices traveled a minimum distance threshold,¹⁸ for a period of time (Fast’s

¹⁸ As noted in Section VII.A.4, to the extent that Patent Owner or the Board adopts a construction that does not require a “minimum distance” as part of the algorithm that performs the recited function, then Claim 1 is rendered obvious by the Taylor-Fast combination without the need to rely on IllinoisLaw. As shown by the relied

“predetermined time limit”), to identify and report potential stalking behavior, thus performing the recited function.

350. Taylor’s central location also includes a transmitter, to enable it to communicate using “wireless communications systems.” Ex-1011, 6:34-40. The central location uses such transmitter to report violations to the victim and law enforcement, as explained for Element 15[D].

3. Dependent Claim 2

- a. **Claim 2: The portable mobile remote according to claim 1, having means to further determine if location disclosure for the remote unit is prohibited at a specific geographic boundary before sending its location to the network.**

351. Taylor-Fast-IllinoisLaw teaches the claimed “means” under the construction proposed in Section VII.A.5, which is equivalent to a control unit programmed to: (1) compare its current location to an exclusion zone; (2) if its current location is within the exclusion zone, abort; (3) otherwise, proceed to provide its current location to the network.

352. Fast teaches that each of its “beacons” includes a control unit in the form of “a microprocessor and a memory for storing programs to be executed by

upon evidence to this point in the analysis, Taylor-Fast and its described “predetermine time limit” teaches this element if the function can be performed using time-only based techniques. But, under the construction set out in Section VII.A.4, the IllinoisLaw teaching is brought in if the function also needs to include a minimum distance-based approach as well.

said microprocessor.” Ex-1012, Cl. 1.

353. Taylor teaches use of “a computer program” to purge a series of position data from Taylor’s locational tracking database when the positions within that series do not vary beyond a “predetermined tolerance range” (because, for example, the monitored person is sleeping). Ex-1011, 11:56-67. While Taylor teaches such “purg[ing]” occurring at the database (*id.*), a POSITA would have recognized advantages in configuring Taylor’s portable monitoring devices to perform such purging locally. For example, a POSITA would have recognized that locally purging positions, rather than storing them for later batch upload or immediately sending them to Taylor’s central location, only for the central location to subsequently purge them, would conserve (1) communication resources, (2) the portable device’s storage resources, and (3) the central location’s processing resources. Indeed, the communication resources consumed by maintaining location data at a central system was a well-known concern in the prior art. *See, e.g.*, Ex-1009, 1:41-52).

354. Accordingly, a POSITA would have been motivated to include Taylor’s purging “computer program” within Taylor’s portable tracking devices, to enable the devices to perform such purging locally. For instance, such computer program could be implemented as part of the programming used by Taylor’s devices to locally identify violations of prohibited areas specified in the devices’ conditional

databases. Ex-1011, 18:40-43. After each time the device transmitted its location to Taylor's central database, the device would be programmed to wait until its current location differed by a "predetermined tolerance range" of the previously transmitted location, before sending a new location to the central database, in order to conserve communication resources, and the central location's processing resources.

355. As explained for Element 15[B], in the Taylor-Fast combined system, Taylor's devices would be configured to dynamically identify perimeter violations (i.e., when the restrictee device is located within one of the restrictor's perimeters) (as taught by Fast), and transmit their location in real time to the central location, as part of reporting such perimeter violations. In a system in which Taylor's devices are modified to perform location "purging" locally (as opposed to transmitting their locations to Taylor's central database, which would then perform such purging), each of Taylor's devices would be configured to report its position to the central location in response to first identifying a perimeter violation, and, while the violation was ongoing, only transmit a new position to the central location if that position varied from the previously reported position by Taylor's "predetermined tolerance range." This predetermined tolerance range would thus correspond to an "exclusion zone," defining an area around the device's last-reported position within which the device should not provide its location to the central location.

4. Independent Claim 22

a. Element 22[pre]: A communication system comprising:

356. Taylor-Fast-IllinoisLaw teaches the preamble of Claim 22, for the reasons explained for Element 1[pre].

b. Element 22[A]: (i) a network of communication units;

357. Taylor-Fast-IllinoisLaw teaches Element 22[A], for the reasons explained for Element 1[A].

c. Element 22[B]: (ii) at least a first communication unit and at least a second communication unit able to provide location information to the network for a time while in motion;

358. Taylor-Fast-IllinoisLaw teaches Element 22[B].

359. Taylor's restrictor monitoring device is a first communication unit, and Taylor's restrictee monitoring device is a second communication unit, as explained for Element 15[pre]. Taylor's devices are in motion, as explained for Element 15[pre], and are able to provide their locations to the central database ("network") for a time during such motion, as explained for Elements 15[A] (restrictor device) and 15[B] (restrictee device).

d. Element 22[C]: (iii) means to request whether the at least second communication unit is tracking the at least first communication unit;

360. Taylor-Fast-IllinoisLaw teaches Element 22[C].

361. Taylor-Fast-IllinoisLaw teaches the claimed "means" under the

construction proposed in Section VII.A.6, which is equivalent to either “antenna 20 and transceiver circuitry 21” configured to transmit tracking requests.

362. As explained for Element 1[E], Taylor teaches that each portable monitoring device includes a “transmitting antenna 116” for transmitting its location to the central location (Ex-1011, 10:18-22). As explained for Elements 22[D]-[E], below, such locations are used to determine and report to the restrictor that he/she is being tracked by the restrictee. Accordingly, a POSITA would have understood that each transmission of location coordinates by the restrictor portable monitoring device corresponds to a request for the central location to track any proximately-located restrictees.

- e. **Element 22[D]: (iv) means to determine from said location provided (ii) that the at least first and second communication unit maintained proximity while in motion during said time;**

363. Taylor-Fast-IllinoisLaw teaches the claimed “means” under the construction proposed in Section VII.A.7, for the reasons explained for Element 1[F].

- f. **Element 22[E]: (v) means to provide result of the determination (iv) to the requestor of (iii).**

364. Taylor-Fast-IllinoisLaw teaches the claimed “means” under the construction proposed in Section VII.A.8, which is equivalent to a transmitter configured to transmit the result of the determination to a device belonging to the

requestor.

365. Taylor's central database includes a transmitter, to enable it to communicate using "wireless communications systems." Ex-1011, 6:34-40. The central location uses such transmitter to report violations to the victim and law enforcement, as explained for Element 15[D].

XIV. CONCLUSION

366. It is thus my opinion that Claims 1, 2, 15, and 22 of the '918 Patent would have been obvious and should be canceled as unpatentable over the prior art.

367. I hereby declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct, and that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true. I understand that willful false statements are punishable by fine or imprisonment or both. *See* 18 U.S.C. § 100.

Date: May 3, 2024

Respectfully submitted,



Scott Andrews