

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.
Petitioner

v.

BROADPHONE LLC
Patent Owner

Patent No. 10,341,811

DECLARATION OF DR. KEVIN C. ALMEROTH

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I, Kevin C. Almeroth, declare as follows:

I. INTRODUCTION

1. I have been retained by Samsung Electronics Co., Ltd. as an independent expert consultant in this proceeding before the United States Patent and Trademark Office against Broadphone LLC regarding U.S. Patent No. 10,341,811 (“the ’811 patent”) (Ex-1001).¹ I have been asked to consider whether the prior art discloses or suggests the features recited in claims 1, 4, 5, 8, 14-15, 18-19, 22, 24-25, and 28 (“the challenged claims”) of the ’811 patent. My opinions are set forth below.

2. I am being compensated at my standard rate for my work in this proceeding. 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 interest in this proceeding.

¹ Where appropriate, I refer to exhibits that I understand are to be attached to the petition for *Inter Partes* Review of the ’811 patent.

II. BACKGROUND AND QUALIFICATIONS

3. I am currently a Professor Emeritus in the Department of Computer Science at the University of California, Santa Barbara (UCSB). While at UCSB, I held faculty appointments and was a founding member of the Computer Engineering (CE) Program, Media Arts and Technology (MAT) Program, and the Technology Management Program (TMP). I also served as the Associate Director of the Center for Information Technology and Society (CITS) from 1999 to 2012. I have been a faculty member at UCSB since July 1997.

4. I hold three degrees from the Georgia Institute of Technology: (1) a Bachelor of Science degree in Information and Computer Science (with minors in Economics, Technical Communication, and American Literature) earned in June 1992; (2) a Master of Science degree in Computer Science (with specialization in Networking and Systems) earned in June 1994; and (3) a Doctor of Philosophy (Ph.D.) degree in Computer Science (Dissertation Title: Networking and System Support for the Efficient, Scalable Delivery of Services in Interactive Multimedia System, minor in Telecommunications Public Policy) earned in June 1997. During my education, I took a wide variety of courses as demonstrated by my minor. My undergraduate degree also included a number of courses more typical of a degree in

electrical engineering including digital logic, signal processing, and telecommunications theory.

5. One of the major concentrations of my research over the past 30+ years has been the delivery of multimedia content and data between computing devices, including through various network architectures. In my research, I have studied large-scale content delivery systems, and the use of servers located in a variety of geographic locations to provide scalable delivery to hundreds or thousands of users simultaneously. I have also studied smaller-scale content delivery systems in which content is exchanged between individual computers and portable devices. My work has emphasized the exchange of content more efficiently across computer networks, including the scalable delivery of content to many users, mobile computing, satellite networking, delivering content to mobile devices, and network support for data delivery in wireless networks.

6. In 1992, the initial focus of my research was on the provision of interactive functions (*e.g.*, VCR-style functions like pause, rewind, and fast-forward) for near video-on-demand systems in cable systems; in particular, how to aggregate requests for movies at a cable head-end and then how to satisfy a multitude of requests using one audio/video stream broadcast to multiple receivers simultaneously. This research has continually evolved and resulted in the

development of techniques to scalably deliver on-demand content, including audio, video, web documents, and other types of data, through the Internet and over other types of networks, including over cable systems, broadband telephone lines, and satellite links.

7. An important component of my research has been investigating the challenges of communicating multimedia content, including video, between computers and across networks including the Internet. Although the early Internet was used mostly for text-based, non-real time applications, the interest in sharing multimedia content, such as video, quickly developed. Multimedia-based applications ranged from downloading content to a device to streaming multimedia content to be instantly used. One of the challenges was that multimedia content is typically larger than text-only content, but there are also opportunities to use different delivery techniques since multimedia content is more resilient to errors. I have worked on a variety of research problems and used a number of systems that were developed to deliver multimedia content to users. One content-delivery method I have researched is the one-to-many communication facility called “multicast,” first deployed as the Multicast Backbone, a virtual overlay network supporting one-to-many communication. Multicast is one technique that can be used on the Internet to provide streaming media support for complex applications like video-on-demand,

distance learning, distributed collaboration, distributed games, and large-scale wireless communication. The delivery of media through multicast often involves using Internet infrastructure, devices and protocols, including protocols for routing and TCP/IP.

8. Starting in 1997, I worked on a project to integrate the streaming media capabilities of the Internet together with the interactivity of the web. I developed a project called the Interactive Multimedia Jukebox (IMJ). Users would visit a web page and select content to view. The content would then be scheduled on one of a number of channels, including delivery to students in Georgia Tech dorms delivered via the campus cable plant. The content of each channel was delivered using multicast communication.

9. In the IMJ, the number of channels varied depending on the capabilities of the server including the available bandwidth of its connection to the Internet. If one of the channels was idle, the requesting user would be able to watch their selection immediately. If all channels were streaming previously selected content, the user's selection would be queued on the channel with the shortest wait time. In the meantime, the user would see what content was currently playing on other channels, and because of the use of multicast, would be able to join one of the

existing channels and watch the content at the point it was currently being transmitted.

10. The IMJ service combined the interactivity of the web with the streaming capabilities of the Internet to create a jukebox-like service. It supported true Video-on-Demand when capacity allowed, but scaled to any number of users based on queuing requested programs. As part of the project, we obtained permission from Turner Broadcasting to transmit cartoons and other short-subject content. We also connected the IMJ into the Georgia Tech campus cable television network so that students in their dorms could use the web to request content and then view that content on one of the campus's public access channels.

11. More recently, I have also studied issues concerning how users choose content, especially when considering the price of that content. My research has examined how dynamic content pricing can be used to control system load. By raising prices when systems start to become overloaded (*i.e.*, when all available resources are fully utilized) and reducing prices when system capacity is readily available, users' capacity to pay as well as their willingness can be used as factors in stabilizing the response time of a system. This capability is particularly useful in systems where content is downloaded or streamed on-demand to users.

12. As a parallel research theme, starting in 1997, I began researching issues related to wireless devices and sensors. In particular, I was interested in showing how to provide greater communication capability to “lightweight devices,” *i.e.*, small form-factor, resource-constrained (*e.g.*, CPU, memory, networking, and power) devices. Starting in 1998, I published several papers on my work to develop a flexible, lightweight, battery-aware network protocol stack. The lightweight protocols we envisioned were similar in nature to protocols like Bluetooth, Universal Plug and Play (UPnP) and Digital Living Network Alliance (DLNA).

13. From this initial work, I have made wireless networking—including ad hoc, mesh networks and wireless devices—one of the major themes of my research. My work in wireless networks spans the protocol stack from applications through to the encoding and exchange of data at the data link and physical layers.

14. At the application layer, even before the large-scale “app stores” were available, my research looked at building, installing, and using apps for a variety of purposes, from network monitoring to support for traditional computer-based applications (*e.g.*, content retrieval) to new applications enabled by ubiquitous, mobile devices. For example, my research has looked at developing applications for virally exchanging and tracking “coupons” through “opportunistic contact” among mobile wireless devices (*i.e.*, communication among devices moving into

communication range with each other). In many of the courses I have taught there is a project component. Through these projects I have supervised numerous efforts to develop new “apps” for download and use across a variety of mobile platforms.

15. Toward the middle of the protocol stack, my research has also looked to build wireless infrastructure support to enable communication among a set of mobile devices unaided by any other kind of network infrastructure. These kinds of networks are useful either in challenged network environments (*e.g.*, when a natural disaster has destroyed existing infrastructure) or when suitable support for network communication never existed. The deployment of such networks (or even the use of traditional network support) are critical to support services like disaster relief, catastrophic event coordination, and emergency services deployment.

16. Yet another theme is monitoring wireless networks, in particular different variants of IEEE 802.11 compliant networks, to (1) understand the operation of the various protocols used in real-world deployments, (2) use these measurements to characterize use of the networks and identify protocol limitations and weaknesses, and (3) propose and evaluate solutions to these problems. I have successfully used monitoring techniques to study wireless data link layer protocol operation and to improve performance by enhancing the operation of such protocols.

For wireless protocols, this research includes functions like network acquisition and channel bonding.

17. One theme in my wireless network research has been cross-layer solutions and innovations. As mentioned above, with greater wireless device use and network support, we envisioned new application paradigms and services, for example, when mobile devices come into contact with each other. Instead of relying on existing infrastructure to relay communication, the devices are able to discover each other and communicate directly. Other examples include discovering and using location information to enhance users' experiences. Network support and novel applications span use a variety of network architectures supporting users on foot, in vehicles, and across varying terrains and environments. Finally, we studied how communication efficiency can be supported through intelligent handoffs as well as location and movement prediction.

18. Protecting networks, including their operation and content, has been an underlying theme of my research almost since the beginning of my research career. Starting in 2000, I have been involved in several projects that specifically address security, network protection, and firewalls. After significant background work, a team on which I was a member successfully submitted a \$4.3M grant proposal to the Army Research Office (ARO) at the Department of Defense to propose and develop

a high-speed intrusion detection system. Key aspects of the system included associating streams of packets and analyzing them for viruses and other malware. Once the grant was awarded, we spent several years developing and meeting the milestones of the project. A number of my students worked on related projects and published papers on topics ranging from intrusion detection to developing advanced techniques to be incorporated into firewalls. I have also used firewalls, including their associated malware detection features, in developing techniques for the classroom to ensure that students are not distracted by online content.

19. My recent work ties some of the various threads of my past research together. I have investigated content delivery in online social networks and proposed reputation management systems in large-scale social networks and marketplaces. On the content delivery side, I have looked at issues of caching and cache placement, especially when content being shared and the cache has geographical relevance. We were able to show that effective caching strategies can greatly improve performance and reduce deployment costs. Our work on reputation systems showed that reputations have economic value, and as such, creates a motivation to manipulate reputations. In response, we developed a variety of solutions to protect the integrity of reputations in online social networks. The techniques we developed for content delivery and reputation management were

particularly relevant in peer-to-peer communication and recommendations for downloadable “apps.”

20. As an important component of my research program, I have been involved in the development of academic research into available technology in the market place. One aspect of this work is my involvement in the Internet Engineering Task Force (IETF). The IETF is a large and open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. I have been involved in various IETF groups including many content delivery-related working groups like the Audio Video Transport (AVT) group, the MBone Deployment (MBONED) group, Source Specific Multicast (SSM) group, the Inter-Domain Multicast Routing (IDMR) group, the Reliable Multicast Transport (RMT) group, the Protocol Independent Multicast (PIM) group, etc. I have also served as a member of the Multicast Directorate (MADDOGS), which oversaw the standardization of all things related to multicast in the IETF. Finally, I was the Chair of the Internet2 Multicast Working Group for seven years.

21. My involvement in the research community extends to leadership positions for several academic journals and conferences. I am the co-chair of the Steering Committee for the ACM Network and System Support for Digital Audio

and Video (NOSSDAV) workshop and on the Steering Committees for the International Conference on Network Protocols (ICNP), ACM Sigcomm Workshop on Challenged Networks (CHANTS), and IEEE Global Internet (GI) Symposium. I have served or am serving on the Editorial Boards of IEEE/ACM Transactions on Networking, IEEE Transactions on Mobile Computing, IEEE Network, ACM Computers in Entertainment, AACE Journal of Interactive Learning Research (JILR), and ACM Computer Communications Review. I have co-chaired a number of conferences and workshops including the IEEE International Conference on Network Protocols (ICNP), IEEE Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON), International Conference on Communication Systems and Networks (COMSNETS), IFIP/IEEE International Conference on Management of Multimedia Networks and Services (MMNS), the International Workshop On Wireless Network Measurement (WiNMee), ACM Sigcomm Workshop on Challenged Networks (CHANTS), the Network Group Communication (NGC) workshop, and the Global Internet Symposium, and I have served on the program committees for numerous conferences.

22. Furthermore, in the courses I taught at UCSB, a significant portion of my curriculum covered aspects of the Internet and network communication including the physical and data link layers of the Open System Interconnect (OSI)

protocol stack, and standardized protocols for communicating across a variety of physical media such as cable systems, telephone lines, wireless, and high-speed Local Area Networks (LANs). The courses I have taught also cover most major topics in Internet communication, including data communication, multimedia encoding, and mobile application design. My research and courses have covered a range of physical infrastructures for delivering content over networks, including cable, Integrated Services Digital Network (ISDN), Ethernet, Asynchronous Transfer Mode (ATM), fiber, and Digital Subscriber Line (DSL). For a complete list of courses I have taught, see my curriculum vitae (CV).

23. In addition, I co-founded a technology company called Santa Barbara Labs that was working under a sub-contract from the U.S. Air Force to develop very accurate emulation systems for the military's next generation internetwork. Santa Barbara Labs' focus was in developing an emulation platform to test the performance characteristics of the network architecture in the variety of environments in which it was expected to operate, and, in particular, for network services including IPv6, multicast, Quality of Service (QoS), satellite-based communication, and security. Applications for this emulation program included communication of a variety of multimedia-based services, including video conferencing and video-on-demand.

24. In addition to having co-founded a technology company myself, I have worked for, consulted with, and collaborated with companies for nearly 30 years. These companies range from well-established companies to start-ups and include IBM, Hitachi Telecom, Turner Broadcasting System (TBS), Bell South, Digital Fountain, RealNetworks, Intel Research, Cisco Systems, and Lockheed Martin.

25. Through my graduate education, leadership with CITS, involvement in TMP, role in the development of the Internet2 infrastructure, and consulting with ISPs, I have gained a strong understanding in the role of the Internet in our society and the challenges of deploying large-scale production networking infrastructure. CITS, since its inception, has looked at the role of the Internet in society, including how the evolution of technology have created communication opportunities and challenges, including, for example through disruptive technologies like P2P. TMP looks to focus on non-purely technical issues, including, for example, state-of-the-art business methods, strategies for successful technology commercialization, new venture creation, and best practices for fostering innovation. Through my industry collaborations and Internet2 work, I have developed significant experience in the challenges of deploying, monitoring, managing, and scaling communication infrastructure to support evolving Internet services like streaming media, conferencing, content exchange, social networking, and e-commerce.

26. I am a Member of the Association of Computing Machinery (ACM) and a Fellow of the Institute of Electrical and Electronics Engineers (IEEE).

27. Additional details about my employment history, fields of expertise, courses taught, and publications are further included in my CV (Ex-1003).

28. I am not an attorney and offer no legal opinions, but in the course of my work, I have had experience studying and analyzing patents and patent claims from the perspective of a person skilled in the art.

III. MATERIALS REVIEWED

29. The opinions in this declaration are based on the documents I reviewed, my knowledge and experience, and professional judgment. In forming my opinions expressed in this declaration, I have reviewed the following materials:

- Ex-1001 U.S. Patent No. 10,341,811 (“*Shkedi*”)
- Ex-1004 Prosecution History of U.S. Patent No. 10,341,811
- Ex-1005 U.S. Patent No. 6,269,246 (“*Rao-I*”)
- Ex-1006 U.S. Patent No. 8,477,731 (“*Nanda*”)
- Ex-1007 U.S. Patent Application Publication 2001/0022558 (“*Karr*”)
- Ex-1008 U.S. Patent No. 7,116,987 (“*Spain-II*”)
- Ex-1009 U.S. Patent No. 6,782,265 (“*Perez-Breva-II*”)
- Ex-1010 U.S. Patent No. 6,393,294 (“*Perez-Breva-I*”)
- Ex-1011 U.S. Patent No. 6,944,465 (“*Spain-I*”)
- Ex-1012 T Suzuki, et al., The Moving-body Position Detection Method; JP Patent Application (shown as 63-195800), August 1988
- Ex-1013 M. Hellebrandt, et al., Estimating Position and Velocity of Mobiles in a Cellular Radio Network, IEEE Trans. On Vehicular Technology, Vol. 46, No. 1, pp. 65-71
- Ex-1014 I Gaspard, et al., Position Assignment in Digital Cellular Mobile Radio Networks (*e.g.*, GSM) Derived from Measurements at the Protocol Interface, IEEE Journal, pp. 592-596, March 1997
- Ex-1015 J. Jimenez et al., Mobile Location Using Coverage Information: Theoretical Analysis and Results, COST 259 TD (98), April 1999

- Ex-1016 U.S. Patent No. 7,848,765 (“*Phillips*”)
- Ex-1017 U.S. Patent No. 7,213,057 (“*Trethewey*”)
- Ex-1018 U.S. Patent Application Publication No. 2004/0203768
 (“*Ylitalo*”)
- Ex-1019 U.S. Patent Application Publication No. 2009/0075651
 (“*MacNaughton*”)
- Ex-1020 U.S. Patent Application Publication No. 2005/0185618
 (“*Friday*”)
- Ex-1026 U.S. Patent No. 6,167,274 (“*Smith-I*”)
- Ex-1027 U.S. Patent Application Publication No. 2004/0152471
 (“*MacDonald*”)
- Ex-1028 U.S. Patent No. 7,346,359 (“*Damarla*”)
- Ex-1029 U.S. Patent No. 6,052,598 (“*Rudrapatna*”)
- Ex-1030 U.S. Patent Application Publication No. 2004/0236850
 (“*Krumm*”)
- Ex-1031 Prosecution History of U.S. Patent No. 8,594,698
- Ex-1032 U.S. Patent No. 7,397,424 (“*Houri*”)
- Ex-1033 U.S. Patent No. 7,305,244 (“*Blomqvist*”)
- Ex-1045 U.S. Patent No. 7,286,835 (“*Dietrich*”)
- Ex-1047 U.S. Patent No. 7,312,752 (“*Smith-II*”)
- Ex-1053 U.S. Patent Application Publication No. 2005/0159174 (“*Bar-On*”)
- Ex-1054 U.S. Patent No. 6,957,076 (“*Hunzinger*”)

- Ex-1055 U.S. Patent No. 7,263,441 (“*Janky*”)
- Ex-1056 U.S. Patent Application Publication No. 2005/0136845
 (“*Masuoka*”)
- Ex-1057 U.S. Patent Application Publication No. 2004/0198386
 (“*Dupray*”)
- Ex-1058 U.S. Patent Application Publication No. 2005/0282557 (“*Mikko*”)
- Ex-1059 U.S. Patent No. 7,474,897 (“*Morgan-I*”)
- Ex-1060 U.S. Patent No. 6,714,865 (“*Angwin*”)
- Ex-1061 U.S. Patent No. 7,525,425 (“*Diem*”)
- Ex-1062 U.S. Patent No. 7,433,693 (“*Sheynblat-I*”)
- Ex-1063 U.S. Patent Application Publication No. 2007/0013584 (“*Camp*”)
- Ex-1064 U.S. Patent Application Publication No. 2008/0139219
 (“*Boeiro*”)
- Ex-1065 U.S. Patent Application Publication No. 2006/0240841
 (“*Bhattacharya*”)
- Ex-1066 U.S. Patent Application Publication No. 2006/0095349
 (“*Morgan-II*”)
- Ex-1067 U.S. Patent No. 6,915,123 (“*Daudelin*”)
- Ex-1068 U.S. Patent Application Publication No. 2007/0010956
 (“*Nerguizian*”)
- Ex-1069 U.S. Patent Application Publication No. 2005/0195761
 (“*Alicherry*”)
- Ex-1070 U.S. Patent Application Publication No. 2007/0133487 (“*Wang*”)

- Ex-1071 U.S. Patent Application Publication No. 2006/0089153
 (“*Sheynblat-II*”)
- Ex-1072 U.S. Patent Application Publication No. 2007/0249365
 (“*Jendbro*”)
- Ex-1073 U.S. Patent No. 7,941,656 (“*Hans*”)
- Ex-1074 U.S. Patent No. 7,454,608 (“*Gopalakrishnan*”)
- Ex-1075 U.S. Patent No. 8,948,785 (“*Grindeland*”)
- Ex-1076 U.S. Patent No. 8,725,406 (“*Kitajima*”)
- Ex-1201 U.S. Patent Application Publication No. 2006/0009235
 (“*Sheynblat-III*”)
- Ex-1202 U.S. Patent Application Publication No. 2004/0259573
 (“*Cheng*”)
- Ex-1203 U.S. Patent No. 7,359,713 (“*Tiwari*”)
- Ex-1204 U.S. Patent Application Publication No. 2003/0129995 (“*Niwa*”)
- Ex-1205 U.S. Patent No. 8,509,814 (“*Parker*”)
- Ex-1206 U.S. Patent Application Publication No. 2002/0102993
 (“*Hendrey*”)
- Ex-1207 U.S. Patent No. 7,072,666 (“*Kullman*”)
- Ex-1208 U.S. Patent No. 7,343,564 (“*Othmer*”)
- Ex-1209 U.S. Patent Application Publication No. 2005/0215243 (“*Black*”)
- Ex-1210 U.S. Patent No. 5,978,673 (“*Alperovich*”)
- Ex-1211 U.S. Patent No. 6,038,451 (“*Syed*”)
- Ex-1212 U.S. Patent Application Publication No. 2001/0055974 (“*Bates*”)

and any other materials I refer to in this declaration in support of my opinions.

30. I base my opinions in this Declaration on the materials I reviewed, my experience, knowledge, and professional judgment. My opinions have also been guided by my appreciation of how a person of ordinary skill in the art would have understood the claims and the specification of the '811 patent at the time of the alleged invention, which I have been asked to consider as September 19, 2006. My opinions reflect how one of ordinary skill in the art would have understood the '811 patent, including the challenged claims, the prior art to the patent and those claims, and the state of the art known to a person of ordinary skill in the art at the time of the alleged invention.

IV. PERSON OF ORDINARY SKILL IN THE ART

31. Based on my knowledge and experience, I understand what a person of ordinary skill in the art would have known at the time of the alleged invention, which I discussed above as being around September 19, 2006. My opinions herein are, where appropriate, based on my understandings as to a person of ordinary skill in the art at that time. In my opinion, based on the materials and information I have reviewed, and based on my experience in the technical areas relevant to the '811 patent, a person of ordinary skill in the art as of the identified effective date of the '811 patent would have had at least a Bachelor's of Science degree in computer science, electrical engineering, or a similar discipline, and two or more years of experience with location determining-based systems and/or processes, such as for example systems/processes for determining mobile device location(s). More education can supplement practical experience and vice versa. I apply this understanding in my analysis herein.

32. All of my opinions in this declaration are from the perspective of one of ordinary skill in the art, during the relevant timeframe (*e.g.*, the time of the alleged invention), which I discussed above as being around September 19, 2006. (*See also my discussions below in Sections V-IX.*)

V. TECHNICAL BACKGROUND

33. As I discuss further below, it is my opinion that the features recited in the challenged claims of the '811 patent are disclosed or suggested in the prior art. Many of the claimed features relate to technologies/techniques that were conventional and known to persons of ordinary skill in the art at the time before the time of the alleged invention of the '811 patent.

34. Below, I present an overview of technologies, techniques, and concepts that were known to a person of ordinary skill in the art prior to and at the time of the alleged invention of the '811 patent. The features, functionalities, and concepts I describe in this technical background section reflect the knowledge of the state of the art that a person of ordinary skill in the art would have had and understood prior to and at the time of the alleged invention of the '811 patent. I rely on, and incorporate as applicable (even if not expressly mentioned below in §IX), the following disclosures and opinions to support my opinions in this Declaration concerning the knowledge, skills, experience, and understanding of technologies, techniques, concepts, etc. in the state of art of a person of ordinary skill in the art near and at the time of the alleged invention (September 19, 2006), including those opinions relating to such a skilled person's understanding as to how the prior art discloses and/or suggests the features/limitations recited in the challenged claims of

the '811 patent and how and why a person of ordinary skill in the art would have been motivated to consider and combine the disclosures and suggestions from one or more prior art references as I explain below in Section IX. In my opinion, the concepts/technologies/techniques discussed below (and where I discuss elsewhere in Section IX) would have been within the knowledge and mindset of a person of ordinary skill in the art at the time.

A. Mobile Device Location Systems/Methods

35. Before the alleged time of invention, information pertaining to the location of a mobile device (cell phones, PDAs, etc.) was desired for a variety of applications. For instance, in the late 90s, the U.S. Federal Communication Commission proposed requirements for cellular telephone carriers to implement wireless telephone location services to assist locating efforts related to 911 calls. (Ex-1056, ¶0006, ¶0019; *see also* ¶¶0010-18.) And various related emergency and military location services were being developed for mobile devices. For example, U.S. Patent Application Publication No. 2004/0152471 to *MacDonald* (Ex-1027) describes:

The MSC 220 can be configured to perform an A/B number analysis to determine whether a location function is to be performed. For example, the MSC 220 can initiate the location function each time a mobile telephone dials

911. In addition, the mobile telephone system provider can offer this location function as a service to its customers. In this situation, if the user of the mobile telephone 120 dials a certain number, the MSC 220 can initiate the location function and the location of the mobile telephone could be communicated to the mobile telephone user.

(Ex-1027, FIG. 17, ¶0049.) Also,

For example, if the location function was initiated because of a 911 call from the mobile telephone 120, the MLM 230 will route the location information to the appropriate public service provider. If the location function was initiated because the MSC determined that the cellular telephone number belonged to a fleet company, the location information would be sent to the appropriate fleet company. Further, the location information could be communicated to the mobile telephone 120 itself if the request for location information came from the user of the mobile telephone 120.

(*Id.*, ¶0090.) (*See also id.*, ¶¶0004, 0091-0101, 0106-0108, 0115, FIGS. 3, 11-15).

Additionally, U.S. Patent Application Publication No. 2004/0198386 to *Dupray* (Ex-1057) explained that:

[L]ocation requesting applications that require relatively precise location information are emergency rescue, and

certain military related applications (*e.g.*, battlefield data fusion, battlefield maneuvers and/or military command, control and communication (C3)).

(Ex-1057, ¶0023; *see also id.*, Abstract, ¶¶0084, 0115, 0161, 0268.)

36. Beyond location applications for emergency services, a person of ordinary skill in the art would have been aware of other mobile phone location-based applications and features. For example, U.S. Patent Application Publication No. 2005/0282557 to *Mikko* (Ex-1058), confirmed such a skilled person's knowledge of

[a]pplication programs [that] have been developed that allow a request for the current location of a mobile terminal by another computing device.

(*See, e.g.*, Ex-1058, ¶0007.) *Mikko* also explained that,

Application programs have also been developed that allow a mobile terminal to request its current location. These applications may, for example, request accurate, real-time positioning of the mobile terminal itself in order to connect the terminal user to nearby points of interest, to advise them of current traffic or weather conditions, or to provide routing information.

(*Id.*) (*See also id.*, Abstract, FIGS. 2-4, ¶¶0008-0009, 0015, 0020, 0031, 0033, 0036, 0038, 0040.)

37. U.S. Patent No. 7,848,765 to *Phillips* (Ex-1016) confirmed a person of ordinary skill in the art's understanding and knowledge of:

methods and systems relating to location-based services such as *social networking*, providing *demographic information*, *tracking* mobile devices, providing *business information*, providing an *adaptable user interface*, remotely *effecting a change on a portable electronic device*, providing a *geofence*, *outputting location-based information* on a mobile device, *varying transmissions* to and from a mobile device, providing *location-based alerts*, *verifying transactions* and *tailoring information to the behavior of a user*.

(Ex-1016, Abstract.)² (*See also id.*, FIGS. 1-4, 6, 7, 27A-27C, 28-42B, 1:18-5:10, 6:30-7:3, 10:1-12:32, 14:38-44 (user may define a geofence via portable device), 16:41-67, 17:39-20:46, 21:34-22:21, 23:50-25:18, 26:38-27:23.)

38. A person of ordinary skill in the art understood and appreciated that the location of a mobile device was often used to trigger various mobile device functions. U.S. Patent Application Publication No. 2009/0075651 to *MacNaughton* (Ex-1019) confirmed a person of ordinary skill in the art's understanding and

² Emphasis is added in this declaration unless noted otherwise.

knowledge of location determining techniques and technologies that allowed a user to choose zones from which selected tasks may be performed when it is determined mobile device is moved outside or inside a particular zone. (Ex-1019, ¶¶0008-0081, 0164-0171, 0177-0185, 0217-0240; Ex-1055, 1:49, 2:20-3:3, 3:49-4:22, 6:12-7:41 (user designated zones where tasks are performed when it is determined mobile device is moved outside or inside zone).) Likewise, location-based reminder applications were well-known. (*E.g.*, U.S. Patent No. 6,957,076 to *Hunzinger*, 1054, Abstract; U.S. Patent No. 7,305,244 to *Blomqvist*, Ex-1033, 3:44-64, 5:10-37.) It was also known to inform and/or activate software applications and device profiles based on location.

Other functions to be mentioned in this context that can be activated on the basis of the location are starting of a program, changing the settings of a device, for example changing the user profile in a mobile station, re-configuration, or a security function. . . . By means of the method according to the invention it is for example possible to activate an application (program) installed in the device 1 at that stage when the device 1 is positioned close to a predetermined location. Further examples of such applications that can be mentioned are call set-up, sending a text message to indicate for example that the

user has arrived to a certain location, activating a map application, etc.

(Ex-1033, 8:52-62; *see also id.*, 5:45-50.)

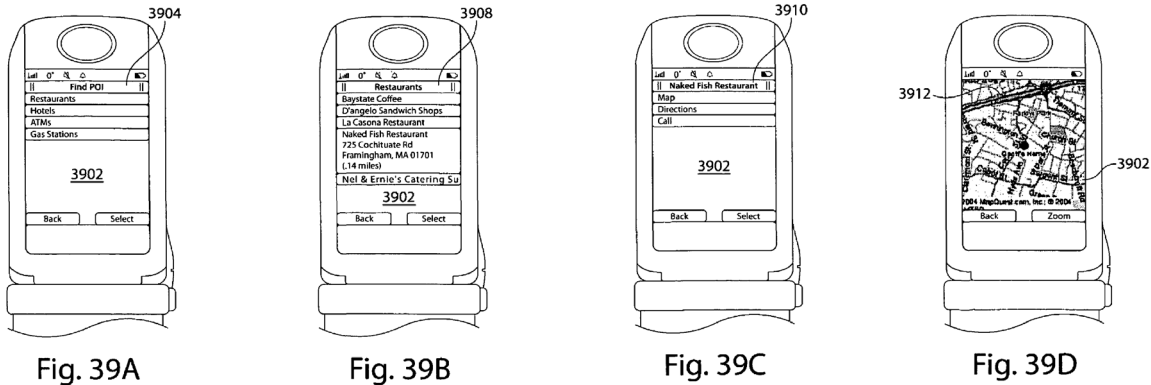
39. Other state of art reference describe similar features that confirm what would have been known, appreciated, and understood by a person of ordinary skill in the art at the time. (*See e.g.*; U.S. Patent No. 7,525,425 to *Diem*, Ex-1061, FIG. 13c, 1:61-2:8, 8:54-9:10, 21:4-13; U.S. Patent No. 7,305,244 to *Blomqvist*, Ex-1033, 1:43-59, 5:46-6:38; U.S. Patent No. 7,346,359 to *Damarla*, Ex-1028, Abstract, FIGS. 4-8, 1:10-4:14, 5:10-16 (MU taken to planned locations where RF samples are taken/record), 5:16-63, 7:23-8:28; U.S. Patent No. 6,052,598 to *Rudrapatna*, Ex-1029, FIGS. 6A-6E ¶¶0033-0034, 0045, 0063, 0071, 0074-0075; U.S. Patent Application Publication No. 2005/0185618 to *Friday*, Ex-1020, Abstract, ¶¶0013, 0029, 0048-0059; U.S. Patent No. 7,213,057 to *Trethewey*, Ex-1017, Abstract (“A method for configuring a mobile computer based on location.”), FIG. 1A-1B, 3, 5, 2:46-3:8, 3:13-4:7, 6:23-8:38; U.S. Patent No. 6,167,274 to *Smith-I*, Ex-1026, Abstract, 3:58-4:56; U.S. Patent Application Publication No. 2004/0152471 to *MacDonald*, Ex-1027, Abstract, ¶¶0012-0023, 0096-0099.)

40. U.S. Patent Application Publication No. 2004/0203768 to *Ylitalo* (Ex-1018) described a “system, apparatus, and method for automatically or interactively

updating a wireless/mobile device's active settings or profile, based on the location of the mobile device.” (Ex-1018, Abstract; *see id.*, FIGS. 1, 5, 6, 7, 8, ¶¶0002-0006, 0071-0081.) U.S. Patent Application Publication No. 2007/0249365 to *Jendbro* (Ex-1072) also described “position determined by means of the received positioning information relating to a current position, and the application requested by the user of the mobile device, are used in combination by control unit 150 to select a profile which is position-dependent, and to load and execute the selected application using parameters determined in the selected profile.” (Ex-1072, ¶0065; *see also id.*, FIGS. 1-2, ¶¶0060-0073; U.S. Patent No. 7,941,656 to *Hans*, Ex-1073, 19:48-54 (“if the mobile device changes its location, a localized set of application identifiers may be allotted to the mobile device. The change of location may also trigger loading one or more of the newly allotted applications.”), 20:40-23:48, FIG. 6; U.S. Patent No. 7,454,608 to *Gopalakrishna*, Ex-1074, 5:33-57 (“At step 240, the appropriate applications are determined and launched according to user's preferences for the location classification.”), FIG. 1, 5:32-6:43; U.S. Patent No. 8,948,785 to *Grindelan*, Ex-1075, 1:12-29 (“[T]here is an increasing interest in developing location-based applications, i.e., applications that make use of mobile station location information. These location-based applications may simply track or monitor the locations of

mobile stations, or they may provide information or services to mobile stations based on their locations.”), Abstract, 2:36-58, 5:10-6:60, 7:38-9:22.)

41. Map/direction and geofencing applications were also popular for determining when a user/mobile device arrived at a location, providing directions, sending coupons based on location, etc. before the alleged time of invention. (*E.g.*, U.S. Patent No. 6,714,865 to *Angwi*, Ex-1060, 6:41-63 (“[A]n application (305), such as a route finder application...”), FIGS. 1A-1C, 3, 5, 1:10-3:21; Ex-1076, 1:7-12 (“The present invention relates to a mobile communication (or communications) terminal such as a cellular (or mobile) phone for showing map data in accordance with position data, and relates to a map display system including the mobile communication terminal and a server for storing map data.”), Abstract, FIGS. 5-8, 7:52-11:50; Ex-1016, 24:5-14 (“the location of the portable electronic facility 300 with respect to the geofence 900 may result in the transmission of information 1702 to the portable electronic facility 300. The information may relate to a coupon, the weather or traffic conditions).”)



(Ex-1016, FIGS. 39A-D.)

42. Thus, before the alleged time of invention, a person of ordinary skill in the art would have appreciated that “[l]ocation-based services [were] an emerging area of mobile applications that leverage[ed] the ability of new devices to calculate their current geographic position and report that to a user or to a service.” (U.S. Patent No. 7,474,897 to *Morgan-I*, Ex-1059, 1:66-2:12; *see also id.*, FIGS. 1-3, 1:50-4:35.)

43. A person of ordinary skill in the art would have appreciated the benefits, needs, and different ways mobile device location features/services were applied. (See, e.g., U.S. Patent No. 6,714,865 to *Angwin*, Ex-1060, 3:12-20 (“There is a need for a technique whereby an application running on a device (such as a route finder application) can determine the device’s position by using a familiar co-ordinate system, irrespective of the technology providing the position information. More specifically, there is a need for a client side service that is available for applications

such as browser services.”), FIGS. 1A-1C, 3, 5, 1:10-3:21; U.S. Patent No. 6,957,076 to *Hunzinger*, Ex-1054, 1:57-2:49, 3:44-6:30.) In fact, *Morgan-I* (Ex-1059) informed a person of ordinary skill in the art that:

Mobile email, walkie-talkie services, multi-player gaming and call following are examples of how new applications are emerging on mobile devices. In addition, users are beginning to demand/seek applications that not only utilize their current location but also share that location information with others. Parents wish to keep track of their children, supervisors need to track the location of the company's delivery vehicles, and a business traveler looks to find the nearest pharmacy to pick up a prescription. All of these examples require the individual to know their own current location or that of someone else.

(Ex-1059, 1:50-65.)

44. The known approaches for determining whether a mobile device was at a particular location included the familiar and then-used global positioning system (“GPS”) operated by the U.S. Government that leveraged dozens of satellites as reference points for location services. (Ex-1059, 1:65-2:27.) A person of ordinary skill in the art would have understood and appreciated that mobile devices at the time were known to be configured with GPS technologies and processes to use GPS

information for location services/applications. (Ex-1061, 1:47-57 (“[M]obile devices have been equipped with GPS receivers, which enable the users to know where they are located at any given time.”), 1:61-2:8, 8:54-9:10, 21:4-13, FIG. 13c; Ex-1011, 1:20-49.)

45. Cell phone signal information was also known to be used to locate mobile devices. In what was understood as location fingerprint techniques, “[t]ypically, the position of a mobile station [was] determined by comparing a RF data sample collected by the mobile station to fingerprint data in the database. The mobile station’s position [was] determined to lie in the area corresponding to a fingerprint data point of highest correlation to the RF data sample.” (U.S. Patent No. 7,433,693 to *Sheynblat-I*, Ex-1062, 1:25-34, FIGS. 1-6, Abstract, 1:11-2:10, 2:29-4:65, 4:65-5:64.) “Cell tower triangulation [was] another method used by wireless and cellular carriers to determine a user or device’s location.” (Ex-1059, 2:28-38.) “These various known location techniques...include[d] collecting ranging measurements such as, for example, a time of arrival (TOA), a time difference of arrival (TDOA), an observed time difference (OTD), or the like.” (U.S. Patent Application Publication No. 2007/0013584 to *Camp*, Ex-1063, ¶0007; *see also id.*, ¶0003, 0009-10.)

46. Various hybrid approaches to mobile device location techniques that involved both the use of GPS information and cell phone signal information were also known to those of ordinary skill in the art at the time. (U.S. Patent Application Publication No. 2008/0139219 to *Boeiro*, Ex-1064, ¶0002 (“Hybrid location methods are known to exploit different localization techniques, such as satellite measures (using *e.g.* the GPS-Global Positioning System--navigation system) and cellular measures (*e.g.*, based on the measure of the electromagnetic field). These known methods use suitable algorithms that, based upon two or more pluralities of measures acquired by the terminal, are intended to globally improve the performance of the positioning, in terms of accuracy, availability, and so on.”), Abstract, FIGS. 1-2, ¶0030; U.S. Patent No. 7,397,424 to *Houri*, Ex-1032 5:1-14 (“Specifically, when the GPS device 12 receives an accurate positioning signal, switch 16 would allow this GPS signal to be directed to the computing device 10 so that the computing device would consider its position that determined by the GPS signal. On the other hand, when the GPS device 12 is unable to provide an accurate GPS signal, switch 16 would allow a positioning signal derived from the wireless positioning system 14, and based on input from the computing device 10 at that time, to be directed to the computing device 10 and the computing device 10 would consider its position that indicated by this positioning signal.”), 4:59-67, 5:59-6:50, 7:52-8:3, 16:23-63.)

47. Location determining systems were known to be configured to determine when a user or mobile device arrived at or left a given/selected location. (E.g., Ex-1016, FIGS. 6, 27A-27C, 28-42B, 14:17-16:9, 19:4-42, 21:34-22:21, 23:50-25:18, 26:38-27:23; Ex-1033, 3:44-64 (“The position data can also contain information for example on the radius, wherein when the user arrives in the area determined by the coordinates and the radius, a predetermined function is performed.”), 6:9-17 (“Thus, the person carries a device 1 according to a preferred embodiment of the present invention in which the position conditions of the location-based functions are monitored in the manner presented in this description. When said person arrives to a certain location or leaves a predetermined location or area, information thereon is transmitted from the device of the person to the monitoring device.”); Ex-1054, 4:21-41, 5:13-22, 5:51-62 (“For example, the user may select that the reminder be triggered only when exiting the region, entering the region or in both cases 425.”); Ex-1062, 1:26-33 (“The mobile station’s position is determined to lie in the area corresponding to a fingerprint data point of highest correlation to the RF data sample.”); Ex-1028, 12:55-13:18 (discussing fingerprint location techniques to determine whether a user has entered or exited a given area).)

48. With respect to user interfaces, a person of ordinary skill in the art was aware of and understood that in many mobile device location systems, users were

able to use a device to mark locations in advance that could later be detected when the user or their device arrived at or left the chosen location. *Hunzinger* (Ex-1054) described examples of user-friendly interfaces that enabled a user to select locations and actions to be performed corresponding to those locations.

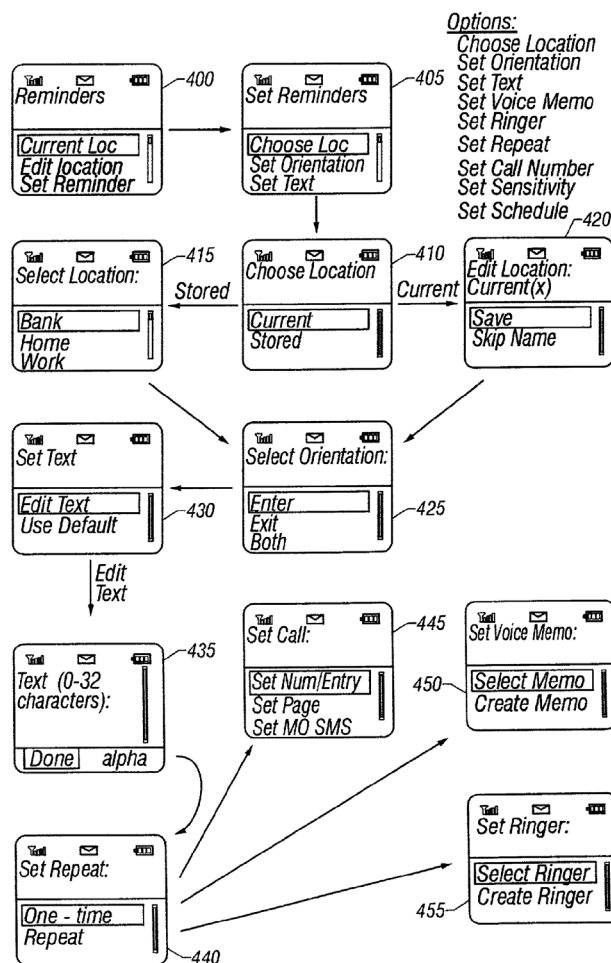
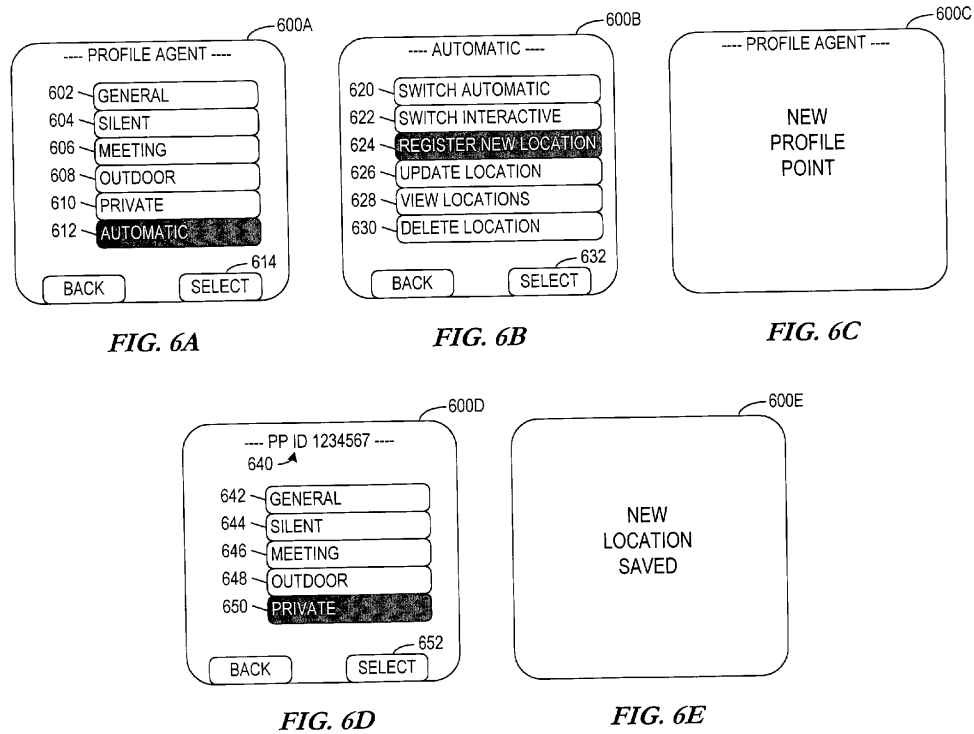


FIG. 4

(Ex-1054, FIG. 4; *see also id.*, FIG. 2, 1:38-2:6, 2:10-44, 3:4-67, 4:1-46, 5:22-6:22.)

U.S. Patent Application Publication No. 2004/0203768 to *Ylitalo* (Ex-1018)

described similar features where profiles were associated with designated locations from which a user could assign using user-friendly interface mechanisms.



(Ex-1018, FIG. 6; *see also id.*, FIGS. 1, 5, 7, 8, Abstract, ¶¶0002-0006, 0071-0081.)

B. Using Radio Frequency Fingerprints/Signatures to Detect/Determine Location

49. As I mentioned above, the use of radio frequency (RF) fingerprints and associated comparisons was known for detecting mobile device location. The basic concept behind RF fingerprinting for location determination was known. For example, U.S. Patent Application Publication No. 2006/0240841 to *Bhattacharya*

(Ex-1065) confirmed a person of ordinary skill in the art's understanding that at a given location:

[T]he values of the traits that vary with the location of wireless terminal...[may] represent a 'fingerprint' or 'signature' for that location.... For example, suppose that under normal conditions the traits have a first set of values when wireless terminal...is at a first location, and a second set of values when wireless terminal...is at a second location. Then when wireless terminal...is at an unknown location and the traits at that unknown location match the second set of values, it is more likely that wireless terminal...is at the second location.

(Ex-1065, ¶0074.) Similar to the unique characteristics of a human fingerprint, it was understood that “[e]very radio device and associated surrounding environment produces a unique signal fingerprint” at a given location. (U.S. Patent Application Publication No. 2006/0095349 to *Morgan-II*, Ex-1066, ¶0050.)

50. It was also known that various signal information could be monitored to generate a unique RF fingerprint for a given location. U.S. Patent No. 6,915,123 to *Daudelin* (Ex-1067) explained that,

A fingerprint refers to a snapshot of the signal characteristics of a receive signal 107. The signal characteristics may include one or more of the following:

propagational delay, antenna identifier, and signal quality indicator (*e.g.*, signal-to-noise ratio or a short-term average of signal strength).

(Ex-1067, 5:16-27; *see also id.*, Abstract, FIG. 2, 5:40-51, 8:66-9:43; U.S. Patent Application Publication No. 2007/0010956 to *Nerguizian*, Ex-1068, ¶0008 (“To constitute a ‘signature’ pattern or a fingerprint, several types of information can be used such as, received signal strength (RSS), received angular power profile (APP) and received power delay profile (PDP) or channel impulse response (CIR).”), ¶¶0007-17.)

51. The use of signal strength measurements for fingerprint-based location services was understood and known years before the alleged time of invention. U.S. Patent Application Publication No. 2005/0195761 to *Alicherry* (Ex-1069) explained, “[f]or example, RADAR (see, P. Bahl et al., ‘RADAR: An In-Building RF-Based User Location and Tracking System’, IEEE Info Com, March 2000...[was] a [then] well-known technique for tracking indoor environments where a single fingerprint of an entire region is constructed and the location of a particular node is determined based on the signal strength observed at its location.” (Ex-1069, ¶0006.) Signal strength information (*e.g.*, the measured power level of a received signal from wireless signal sources, such as base stations, etc.) was commonly used with location

fingerprints at the relevant time. (*E.g.*, Exs-1006, 1008-1011; Ex-1026, Abstract, FIGS. 1-3, 5, 2:13-3:12, 3:30-4:49; Ex-1028; Ex-1070, Abstract, FIGs. 4-5, ¶¶0010-13, 0036-0038; Ex-1071, FIGS. 2-6.)

52. It was also known at the time various ways for using fingerprint information to determine whether a mobile device was at or near a particular location. For example, a person of ordinary skill in the art was aware and was able to develop systems/processes that compared RF fingerprint information for a currently monitored device location to previously saved fingerprint information that was collected/generated for given locations. (*E.g.*, Ex-1071, ¶0004 (“Typically, the position of a mobile station is determined by comparing a RF data sample collected by the mobile station to fingerprint data in the database.”).) If currently monitored information matches or was close to a reference fingerprint, proximity to a location was determined. (*E.g.*, Ex-1028, 6:34-37 (“The MU RF fingerprint is compared or matched to the reference RF fingerprints 3000 produced in the survey process.”); Ex-1068, ¶0007 (“The first phase consists of recording a set of fingerprints as a function of the user's location, covering the entire zone of interest. During the second phase, a fingerprint is measured by a receiver and compared with the recorded fingerprints of the database. A pattern matching algorithm (positioning algorithm) is then used to identify the closest recorded fingerprint to the measured one and hence

to infer the corresponding user's location.”).) A person of ordinary skill in the art would have been aware of and capable of developing, programming, and/or implementing various algorithms for performing fingerprint comparisons/analysis. (See e.g., Ex-1068, ¶0013 (“Several geolocation systems, using fingerprinting techniques, have been deployed in both indoor and outdoor environments. The main differences between these systems are the types of fingerprint information and the types of pattern matching algorithms.”).)

53. It was also known and appreciated by a person of ordinary skill in the art that reference fingerprints used for location determination were often stored in some form of a database, including in memories in a mobile device or in a server or other remote system/device. (Ex-1028, 16:43-45 (“Reference RF fingerprints must be stored in some form of database. They are most likely stored in the infrastructure, but could be stored on the MUs themselves.”).)

54. In sum, a person of ordinary skill in the art would have been aware of, experienced with, and capable of configuring, modifying, programming, etc. systems and processes that provided the conventional features I mentioned above, including those associated with the then-conventional approach of using RF fingerprint snapshots and corresponding comparisons to determine whether a mobile device was currently at, near, or left a previously selected location. (E.g., Exs-1006,

1008-11, 1026, 1028, 1070, 1071.) Such fingerprint-based location processes (among others) were often considered in applications where GPS location determinations may not have been possible or practical and because such location determining processes would leveraged existing mechanism, components, network infrastructures, and software programming skills to implement. (*E.g.*, Ex-1011, 3:34-46, 15:19-29.) At the same time, a person of ordinary skill in the art would have been aware and capable of developing, configuring, and/or implementing location determining systems that leveraged GPS technologies to collect geographical information for purposes of maintaining/building a fingerprint database. (*See e.g.*, Ex-1032, Ex-1032, Abstract, 1:15-31, 3:23-4:26, 4:59-67, 5:59-6:39.)

VI. OVERVIEW OF THE '811 PATENT

55. I understand from my review that the '811 patent issued on July 2, 2019, from U.S. Patent Application No. 14/085,603 filed November 20, 2013. (Ex-1001, cover.)

56. The Abstract of the '811 patent describes:

At least one portable RF communications device in conjunction with at least two fixed-location service-area antenna stations respectively capable of RF communication with the at least one device performs the steps of: (I) using a portable device at a selected location to measure RF communications signals from the plurality of local fixed-location service-area antenna stations and electronically storing at least two of the respective reception signal strength measurements; and (II) monitoring a portable device location by causing the device to measure reception signal strength associated with local fixed-location service-area antenna stations signals, and to electronically compare these measurements with the stored at least two measurements.

(*Id.*, Abstract; *see also id.*, 6:24-39, 18:30-19:19, 24:54-25:17.)

57. The '811 patent indicates that

When it is described according embodiments of the instant invention that a cell phone measures a signal-strength

from a surrounding cell, it means that the cell phone measures the strength of the signal sent by that cell's base station antenna. These measurements are from the perspective of the location of the reception device (the cellular telephone, ubiquitous computer, etc.) and substantially form an instance of an antenna space reception fingerprint[.]....

(*Id.*, 17:66-18:8.) “Once the cell phone records the signal strengths measured by the cell phone from surrounding cells at a desired location, the combination of the *recorded signal strengths from surrounding cells are used as the coordinates of the desired location.*” (*Id.*, 19:12-16.) The signal strengths are respectively stored in unique radio frequency snapshots referred to as “fingerprints.” (*Id.*, 16:66-17:7.) “The user will stand in the location where he would like something to take place every time he reaches that place (a desired location)” and “[u]sing his cell phone he will choose the action that he wants to take place.” (*Id.*, 18:46-49.)

58. “After the cell phone records the desired location coordinates (the combination of signal strengths from surrounding cells), the cell phone will check its location as reflected by the signal strengths from surrounding cells....” (*Id.*, 19:20-23.)

If the current location's surrounding cell IDs are different from the desired location's surrounding cell IDs then the

cell phone does not need to continue the comparison, the current location is clearly not the desired location. ***When the signal strengths*** from the cells surrounding the current location ***are identical*** to the signal strengths measured by the cell phone from the exact same cells (same cell IDs) at the desired location ***then the cell phone is determined to have returned to the desired location (i.e. current location=desired location)*** and the location based application which is pending the return of the cell phone to the desired location will be activated.

(*Id.*, 19:35-46.)

VII. CLAIM CONSTRUCTION

59. I understand that claim terms are typically given their ordinary and customary meanings, as would have been understood by a person of ordinary skill in the art at the time of the alleged invention. For purposes of this declaration, I have been asked to apply the plain and ordinary meaning of the terms in the challenged claims (although I may address other interpretations that I have been asked to consider below in my analysis of those claims in Section IX). My opinions concerning the interpretation of the challenged claim terms is based on the time of the alleged invention I have been asked to consider (*e.g.*, September 19, 2006). I understand that in considering the plain meaning of the claims, one must consider the language of the claims, the specification, and the prosecution history of record. I have done so to support my opinions in this declaration where appropriate.

60. While the plain meanings of the challenged claim terms are applicable here, I have been asked to consider how the claimed **“at least one number based on signal strengths”** (limitation 1(b)) is met under its plain meaning and in context of representations concerning that term during prosecution, including representations made in a parent application. Specifically, I have been asked to consider whether the prior art discloses or suggests **both direct signal strength measurement numbers and calculations that are based on signal strength**

values like that claimed. (Ex-1004 ('811 patent file history), 41-43 (“[T]here’s got to be comparison of a new -- a current measurement and an old stored measurement of signal strength....And...neither reference compares any other number that’s based on that signal strength, new or old. So whether it’s direct -- signal strength comparison directly or comparing any calculation based on signal strength, neither reference does it.”), 75 (“The claim term ‘*number based on the signal strengths*’ must be interpreted as a number that is ‘based on,’ *i.e.*, depends on, the signal strengths, and cannot reasonably be interpreted to cover a number that is not ‘based on’ any signal strength.”), 140 (“All independent claims require comparing (i) ‘*a number based on the signal strengths of first plurality of communication signals*’ to (ii) ‘*a number based on corresponding signal strengths of a second plurality of signals*.’ The second number is derived from previously measured or received signal strengths at a target location. Appellant sometimes refers the first ‘number’ as ‘a comparison metric’ and the second number as ‘a compared-to metric,’ for ease of reference and clarity, but those terms refer directly to the quoted claim language.”); *see also* Ex-1031 ('698 parent patent file history), 166-167 (representing “the ‘number based on...’ is intended to refer to the output of any ‘formula,’ including but not limited to a difference formula,...or ‘determinations that are based on derivatives, integrals, statistical metrics, mathematical normalizations, correction

functions, [or] heuristic convolution functions.”).) My opinions below address such features.

61. I have also been asked to consider if the claimed **“proximity”** and **“device-specific target location”** determination claim features are disclosed or **suggested** under their plain meaning and in context of representations concerning these terms during prosecution, including **by comparing signal strength metric values/numbers at a target location**. (Ex-1004, 127 (“As indicated in part (b), the portable device causes a determination of whether the portable device is within proximity of a device-specific target location by comparing (i) a comparison metric derived from signals currently received at the device from plural base stations (*‘a number based on the signal strengths of first plurality of communication signals’*), *‘a comparison metric’* for short, to (ii) a number derived from previously identified signal strengths at a target location (*‘a number based on corresponding signal strengths of a second plurality of signals’*), *‘a compared-to metric’* for short.”), 136 (same).) My opinions below address such analysis.

VIII. OVERVIEW OF THE PRIOR ART

A. *Spain-I* (Ex-1011)

62. I understand that *Spain-I* is an issued United States patent. (Ex-1011, Cover.) My understanding is that *Spain-I* was filed November 18, 2002, and issued September 13, 2005. (*Id.*) For purposes of my analysis, I have been asked to assume *Spain-I* (and its incorporated disclosures) is prior art.

63. I also understand that *Spain-I* is a continuation-in-part (CIP) of *Perez-Breva-II* (Ex-1009), *Perez-Breva-I* (Ex-1010), and *Rao-I* (Ex-1005). (Ex-1011, Cover.) *Spain-I* incorporates by reference each of those patents (*id.*, 1:5-14) and the disclosures in Exhibits 1012-1015 (*id.*, 15:1-16). Thus, I understand and have been asked to assume that the disclosures of Exhibits 1005, 1009-1010, and 1012-1015 are considered part of the disclosure of *Spain-I*. While I reference *Spain-I* to support my opinions regarding the challenged claims, I also refer to disclosures in the incorporated prior art references of *Perez-Breva-II* (Ex-1009), *Perez-Breva-I* (Ex-1010), and *Rao-I* (Ex-1005).³

³ My opinions regarding how the prior art disclose or suggests the limitations of the challenged claims in §IX below would not change if the disclosures in Exhibits 1005, 1009-1010, and 1012-1015 were not considered part of *Spain-I*.

64. *Spain-I* discloses a “method for determining the location of MU 10 which (a) works in areas where GPS coverage is not typically available, and (b) does not require any infrastructural modifications.” (Ex-1011, 3:35-41.) A mobile unit (“MU”) (red below) is operable to perform location-determining processes based on comparisons operations, where the MU works in conjunction and communicates with a plurality of antenna stations that are capable of RF communication with the MU. (Ex-1011, FIGS. 1-2 (annotated below), 9-10, 1:18-49, 3:5-34, 3:41-4:63, 5:20-6:34, 7:58-8:44, 9:25-13:15, 13:16-14:37, 15:19-35; *see also* Ex-1005, FIGS. 1-2, FIGS. 4-5, Abstract, 1:26-34, 1:40-57, 2:8-11, 2:33-36, 2:30-3:9, 3:29-61, 4:59-63, 5:40-56; Ex-1010, Abstract, FIGS. 1-2, 5-10, 1:10-60, 2:23-5:41, 7:1-54, 8:42-11:29; Ex-1009, Abstract, FIGS. 1-2, 9-10, 1:14-64, 2:25-6:50, 7:4-8:14, 8:46-11:17; *see my below analysis in §§IX.A.1(a)-(b).*)

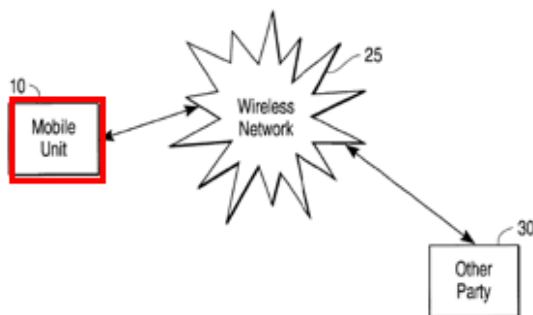


FIG. 1

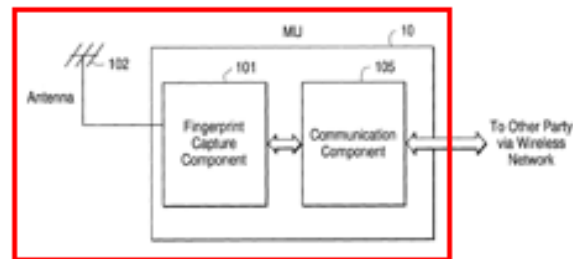


FIG. 2

65. *Spain-I* explains that the MU communicates with base stations during operation. (*E.g.*, Ex-1011, 4:7-22, 1:25-28, 10:35-41, 11:57-65.) And at selected

location(s), the MU collects identifier information (*e.g.*, station ID) and measures signal strengths associated with communication signals received from stations in range of the MU capable of RF communications with the mobile device at those location(s). (Ex-1011, 3:42-4:63, 5:20-6:8, 7:58-8:8, 10:43-46, 11:41-46, 13:16-14:37; Ex-1005, 4:16-37, 5:40-56, 6:34-51; Ex-1010, 3:4-4:9, 4:32-44, 4:63-5:24, 7:1-18, 10:4-32; Ex-1009, 2:61-5:21, 7:40-57, 9:15-10:37.)

66. The MU creates/stores fingerprints including station identifier information and measured signal strengths corresponding to the received communication signals from the stations when the MU is certain locations. (Ex-1011, FIG. 9, 3:41-4:6, 4:5:20-6:30, 7:58-8:8, 10:48-11:26, 11:41-46, 13:16-55; Ex-1005, FIG. 4, 3:29-61, 4:23-27, 4:59-5:9, 5:40-6:12, FIG. 4, Ex-1009, FIG. 9, 5:1-21, 7:4-21, 9:15-54; Ex-1010, FIG. 9, 5:5-57, 7:1-36, 9:10-49.) Collections of fingerprints are stored in a database used for the disclosed location-determination processes. (Ex-1011, FIG. 10, 10:48-11:27, 13:56-14:37, Ex-1005, FIG. 5, 6:13-61; Ex-1009, 9:55-10:47; Ex-1010, FIG. 10, 9:50-10:32.)

67. “When a location estimate of the MU is desired (either by itself or by the Other Party), it [MU] activates component 101 (FIG. 2), which captures predetermined information from a predetermined portion of the RF spectrum.” (Ex-1011, 4:42-46; Ex-1005, 3:29-39; Ex-1009, 3:60-63; Ex-1010, 3:56-60.) The MU

creates a fingerprint associated with a current monitored location by measuring *e.g.*, signal strengths received from identified service stations. (Ex-1011, 5:20-6:8, 7:64-8:44, 9:25-10:27, Ex-1005, 3:29-4:24; Ex-1009, 3:63-4:44, 5:7-21; Ex-1010, 3:60-4:44, 5:5-19.) The fingerprint may be generated “using *many different parameters*, either *individually or in combination*.” (Ex-1011, 4:55-56; Ex-1005, 3:40-42; Ex-1009, 4:4-5; Ex-1010, 4:1-2.) This includes *signal strengths* of received signals and “the identity of the signal source (*e.g.*, channel number of *station code*)” (Ex-1011, FIG. 4, 4:56-63; Ex-1005, 3:42-49; Ex-1009, 4:6-11, Ex-1010, 4:3-8.) Indeed, the MU is “equipped with appropriate circuitry to determine the strength of the received signal” and the “location of the transmitter is broadcast in the signal and is extracted in the MU” (Ex-1011, 5:28-32, 3:55-58, 5:20-28 (MU captures signals and their parameters); Ex-1005, 3:57-61, 4:16-18; Ex-1009, 3:7-24, 4:34-44; Ex-1010, 3:4-21, 4:32-44.)

68. The MU performs processes to determine whether the MU is currently “at a particular location or not” (Ex-1011, 4:23-25⁴; Ex-1005, 3:10 18.) For

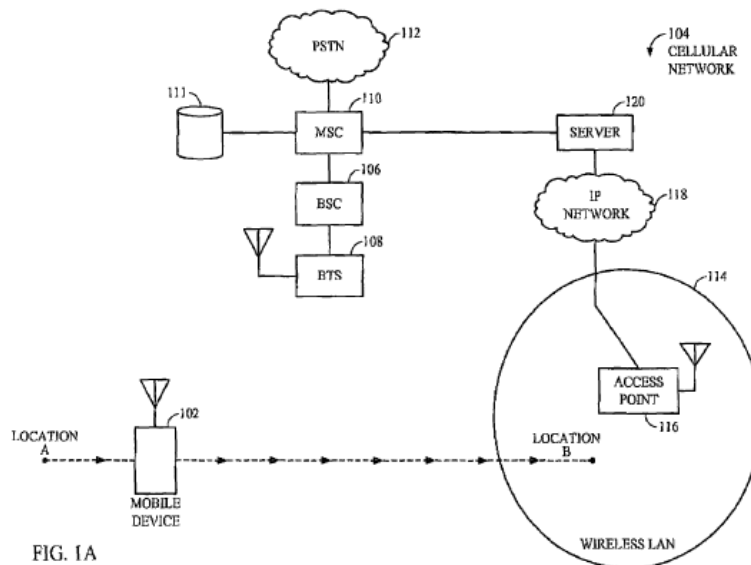
⁴ *Spain-I* explains elsewhere that the MU can initiate the location estimate processes (Ex-1011, 4:43–47 (“location estimate of the [MU] is desired (either by the [MU] itself or by the location server)”).)

instance, the MU compares fingerprint information for a current monitored location with previously generated/stored fingerprint information relating to other locations to determine a “closest” match. If the relevant compared information matches (or is close), the MU determines the MU is at or in proximity of the location associated with the matching fingerprint in the database. (Ex-1011, 5:61-6:8.) *Spain-I* discloses various processes for determining closeness between compared fingerprint information and for making such analysis more efficient. (Ex-1011, FIGS. 9-10, 5:61-6:8, 7:58-67, 8:1-26 (closest matching fingerprint), 8:27-10:27, 10:29-13:15 (reducing set of fingerprint information for comparison), 14:10-37 (measuring signal characteristics at predetermined locations and interpolating fingerprints between “sampled locations”), 17:15-19; Ex-1005, 3:29-4:37, 4:65-5:9, 5:10-40, FIGS. 4-5, 5:40-6:47, 6:48-61; Ex-1009, 3:40-4:46, 5:1-21, 7:4-9:14, *see also id.*, 5:44-7:3; Ex-1010, 3:37-4:44, 4:64-5:19, 7:1-9:10.)

B. Nanda (Ex-1006)

69. I understand that *Nanda* is an issued United States patent. (Ex-1006, Cover.) My understanding is that *Nanda* was filed February 15, 2006, and issued July 2, 2013. (*Id.*) For purposes of my analysis, I have been asked to assume *Nanda* is prior art.

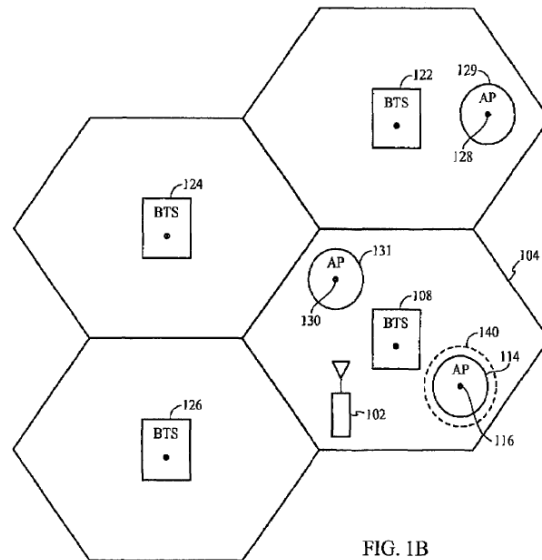
70. *Nanda* describes systems/processes similar to *Spain-I*, which determine whether a mobile device is “in the vicinity of” a location by comparing fingerprint information. (*Id.*, 2:16-59, 5:50-7:28.) In particular, *Nanda* describes a mobile device 102 that moves through a wireless network (WAN 104) including plurality of BTSs 108 (base stations), and one or more wireless LANs 114, each including an access point 116. (*Id.*, FIG. 1A (below), 3:48-4:14, 5:9-14.)



71. As exemplified in connection with FIG. 1A, mobile device 102 searches for beacon signals transmitted from access point 116 as it moves through WAN 104 from location A to B. (*Id.*, 4:24-64.)

72. In the event device 102 cannot detect a beacon or receives a probe request (*e.g.*, when at location A above), the device “attempts to access the WAN 104” when it is determined it is close to WLAN 114 by acquiring a pilot signal from

BTS 108. (*Id.*, 4:38-48.) At that point, a radio connection may be established between device 102 and BTS 108 “by means well known in the art,” which the device may use with the BTS 108 to register with a mobile switching center (MSC) 110. (*Id.*, 4:48-52.) FIG. 1B below shows a larger WAN having multiple BTSs 108, 122, 124, 126 in coverage area cells, and multiple LANs 129, 131, 114 with respective access points 128, 130, 116. (*Id.*, 5:15-18), including a coverage area for access point 116 and LAN 114 (140). (*Id.*, 5:41-49.)



73. *Nanda* discloses features that limit searching for signals from access points only when mobile device 102 is determined to be within a LAN/access point coverage area. (Ex-1006, 5:41-49.) Device 102 monitors beacon and pilot signals from the base stations of WAN to measure primary and neighbor signal strengths. (*Id.*, 5:50-57.) Device 102 can observe up to n base stations with measurable signal

strengths (characterized as vectors $X_1 \dots, X_n$) originating from a particular identified base station. (*Id.*, 5:57-67, 5:67-6:3 (“neighbors base stations may be identified by frequency channel or other ***base station identifier and a signal strength associated with each base station***”).) The vectors can include information that “identifies a source and at least one characteristic of the reference signal, *e.g.*, pilot or paging signal.” (*Id.*, 6:3-11; *id.*, 6:12-34 (signal strength and base station identifier).)

74. Such information may be used to provide a fingerprint of a location of mobile device 102. (*Id.*, 6:52-58 (“[i]f locations within the area 140 have a certain known fingerprint, then the ***mobile device can determine its current fingerprint and compare it to the known fingerprint to determine whether the mobile device is located within the area 140.***”).) Other attributes, and combinations thereof, may be used as a fingerprint (*id.*, 6:58-66) given “a fingerprint is a collection of attributes of a first communication network that changes based on location and can be used by the mobile device to determine the proximity of a second communication network” and can include characteristics of the transmitters of the second networks (*e.g.*, MAC ID, band, channel, access point RSSI information (*e.g.*, signal strength)) (*id.*, 7:6-14). Such attributes may be calculated in different ways, such as instant signal strength measurements or multiple measurements may be averaged together or

otherwise combined in some statically significant manner in order to generate the fingerprint. (*Id.*, 7:19-28.)

75. *Nanda* explains with reference to Figure 3A (below),

Once the mobile device has connected with the access point, the user may, in step 304, signal to the device to capture the current fingerprint. This step may typically be user-initiated because the user may want only certain wireless LANs to be stored in the fingerprint database such as those wireless LANs that the user normally subscribes to or connects.

(Ex-1006, 9:61-10:7.)

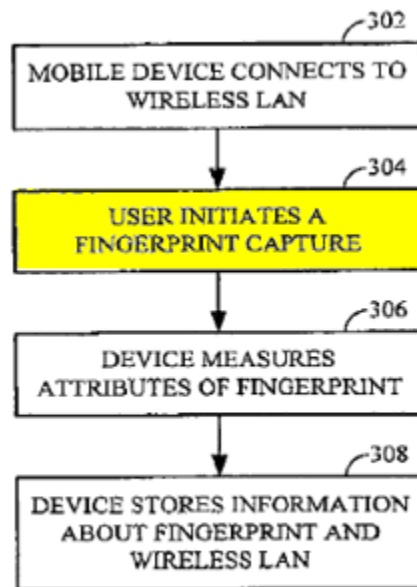


FIG. 3A

C. *Tiwari* (Ex-1203)

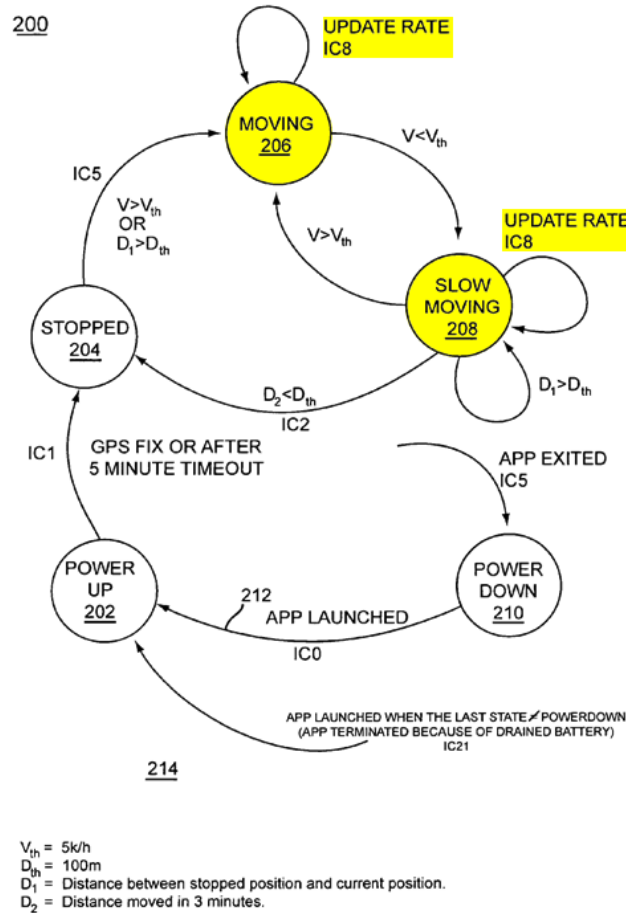
76. I understand that *Tiwari* is an issued United States patent. (Ex-1203, Cover.) My understanding is that *Tiwari* was filed February 28, 2003, and issued April 15, 2008. (*Id.*) For purposes of my analysis, I have been asked to assume *Tiwari* is prior art.

77. *Tiwari* discloses systems/processes relating to location services for mobile devices, including where such a device may determine its location based on “cellular signals.” (*Id.*, Abstract, FIG. 1, 2:39-67.) *Tiwari* also discloses features that dynamically adjust how often a location determination is performed based on the rate of change of a user’s location. For example, *Tiwari* explains that a mobile device that can conduct location determining operations “usually has a limited amount of power available from its battery and frequent use of the location determination technique may quickly drain the battery.” (*Id.*, 1:13-36.) In order to make such location determining processes more efficient, *Tiwari* describes configurations where the device may monitor whether it is in a stopped state, moving state, or a slow moving state. (*Id.*, 3:30-4:50, FIG. 2.)

78. For instance, “if mobile communication device 100 is in slow moving state 208, the **location determination** function **may be performed at a lower frequency** relative to when mobile communication device 100 is in moving state

206, **because the location of mobile communication device 100 is changing at a slower rate.**” (*Id.*, 4:15-24.) The location determination frequency (*e.g.*, “one minute, thirty seconds, 5 seconds,” etc.) may be based on the velocity of the user. (*Id.*, 4:34-5:14.)

79. “By monitoring the state of the device (*e.g.*, stopped, slow moving, or moving),” *Tiwari* discloses that “it can be determined how often a location determination should be performed to provide adequate tracking and monitoring of mobile communication device 100.” (*Id.*, 4:25-50.) In this fashion, “battery power may be conserved by preventing unnecessary location determinations, such as when mobile communication device 100 is stopped or moving slowly” based on the rate of change of a user’s location. (*Id.*, 6:48-61, FIG. 2 (below).)



D. *Othmer* (Ex-1208)

80. I understand that *Othmer* is an issued United States patent. (Ex-1208, Cover.) My understanding is that *Othmer* was filed December 9, 2005 and issued March 11, 2008. (*Id.*) I also understand that *Othmer* relates to application number 10/916,960, which was filed August 11, 2004, and application number 60/494,644, which was filed August 11, 2003. For purposes of my analysis, I have been asked to assume *Othmer* is prior art.

81. *Othmer* discloses, among other features, systems and processes relating to location services for mobile devices, where a device can detect its location based on cell site signals or other well understood methods. (*Id.*, Abstract, FIG. 1 (below), 1:16-22; 2:37-51, 3:8-32, 3:32-45 (“Determining a mobile device’s location is well understood in the art and can be done through a number of means....”), 7:54-8:15.)

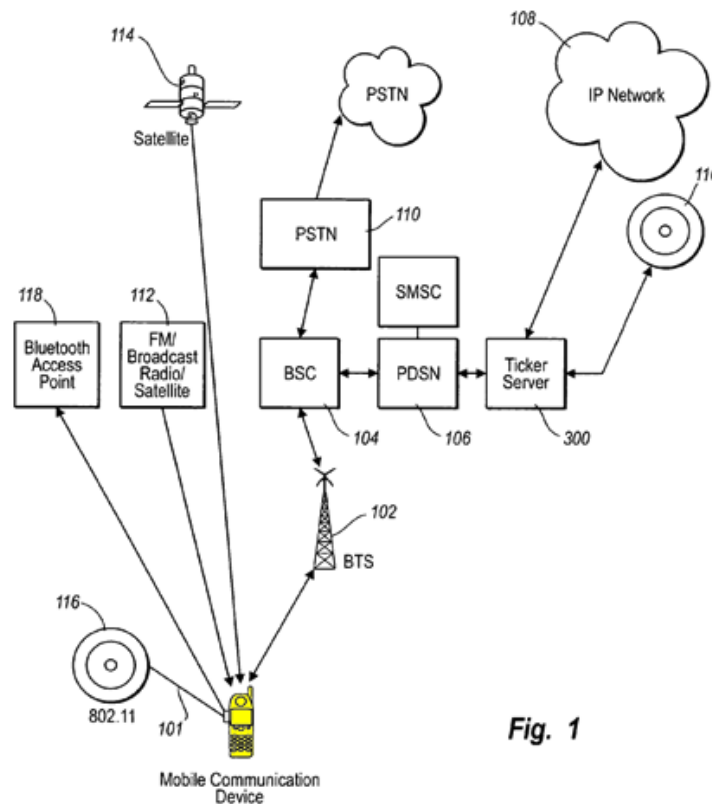
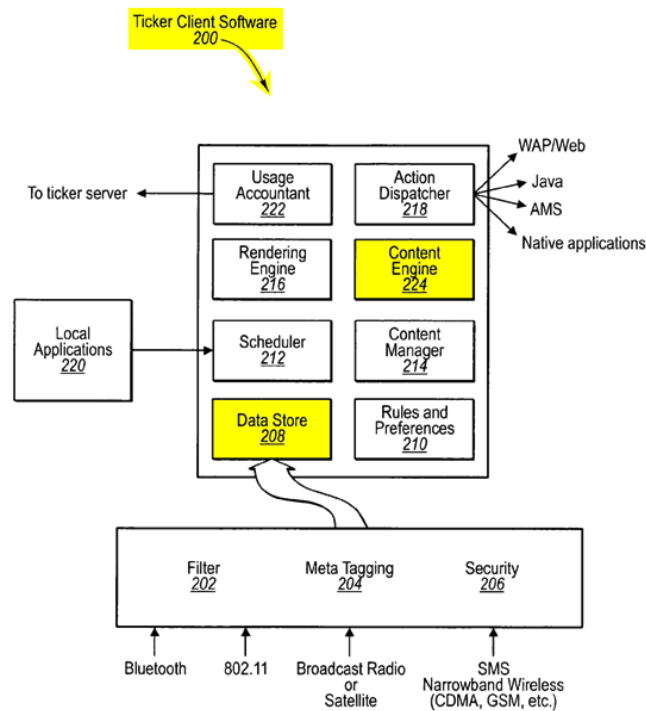


Fig. 1

82. Additionally, *Othmer* discloses techniques to display coupons on mobile devices based on location, such as “promotional coupon[s]” on a “ticker”/scrolling information display of a user’s mobile phone. (*Id.*, 1:24-65, 2:36-51, 3:46-63, 8:19-44, FIGS. 1-2.) Such a “*promotional coupon is associated with*

metadata that includes a proximity rule stating that if a user arrives at a location within a specified distance of a Peet's retail store, the information is to be displayed on the ticker of the user's device.” (Id., 3:46-63; see also id., 10:15-34 (engine periodically checking device location and matching current location with available content (such as coupons)), FIG. 2 (below), 2:36-65, 4:21-35, 8:29-9:21.)



83. When mobile device determines that its current location (retail store) is a match for stored content (coupon), it is displayed to the user. (*Id.*, 14:50-15:26, 2:36-65, 3:46-63, 8:29-9:21, 10:15-34.) As configured, a promotional coupon for Peet's retail store, etc. "may be...stored on the device pending display when the user reaches the location specified in the proximity rule." (*Id.*, 3:46-63.)

E. *Blomqvist* (Ex-1033)

84. I understand that *Blomqvist* is an issued United States patent. (Ex-1033, Cover.) My understanding is that *Blomqvist* was filed January 21, 2004, and issued December 4, 2007. (*Id.*) For purposes of my analysis, I have been asked to assume *Blomqvist* is prior art.

85. *Blomqvist* discloses methods for efficiently detecting the location of a mobile device. (*Id.*, Abstract, 1:43-2:16, 2:63-3:12.) *Blomqvist* also discloses a device 1 (mobile phone) similar to the mobile devices disclosed by *Spain-I* and *Nanda*. (*Id.*, FIG. 2, 5:10-60.) The device can automatically trigger a function when a specified location is detected. (*Id.*, FIG. 2, 5:10-60.)

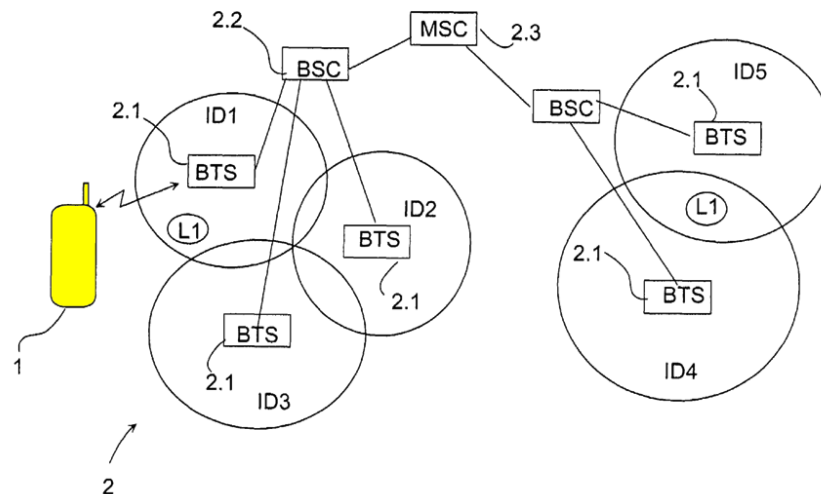


Fig. 2

(*Id.*, FIG. 2 (annotated).)

86. *Blomqvist* describes processes that aim to reduce the need to perform positioning processes, which reduces loading of the processor of the mobile device and possible loading of the network the device operates in. (*Id.*, 2:63-3:12.) For instance, *Blomqvist* discloses monitoring processes in which location positioning only starts taking place when the mobile device detects that it switched to a new cell base station. (*Id.*, 4:35-45 (“[A]t least one property of the wireless communication network and changes in the same are monitored. In the following, cell identifiers and changes in them are used”).) *Blomqvist* explains that,

FIG. 1b shows another example situation in which the method according to a preferred embodiment of the invention is applied. Also in this situation, position data is determined in the location-based function. Advantageously at least this position data is transmitted to the communication network 2, in which it is determined (for example in a network centre 2.3) in the area of which cell or cells this location is situated. ***Information on the identifiers of such a cell or cells is transmitted to the device 1, in which the information is stored into the memory 1.1*** for example into the information of said location-based function. In the device 1, the ***changing of the cell identifier is monitored as disclosed hereinabove*** in connection with the description of the method according to the first embodiment of the invention. At that stage

when the serving base station changes, i.e. the cell identifier changes, the device 1 examines the information on the location-based functions on the basis of the new cell identifier. If one or several cell identifiers that have been determined for a location-based function *match with the cell identifier of the new serving base station, i.e. the device 1 is probably in the vicinity of such a location in which the execution of a location-based function is determined, positioning is conducted.* At that stage when the positioning shows that the device 1 is in the area determined for said location-based function, said location-based function is conducted.

(*Id.*, 6:46-64; *see id.*, FIG. 1b (below), 7:19-26 (“the cell identifier is also compared with the stored cell identifiers”).)

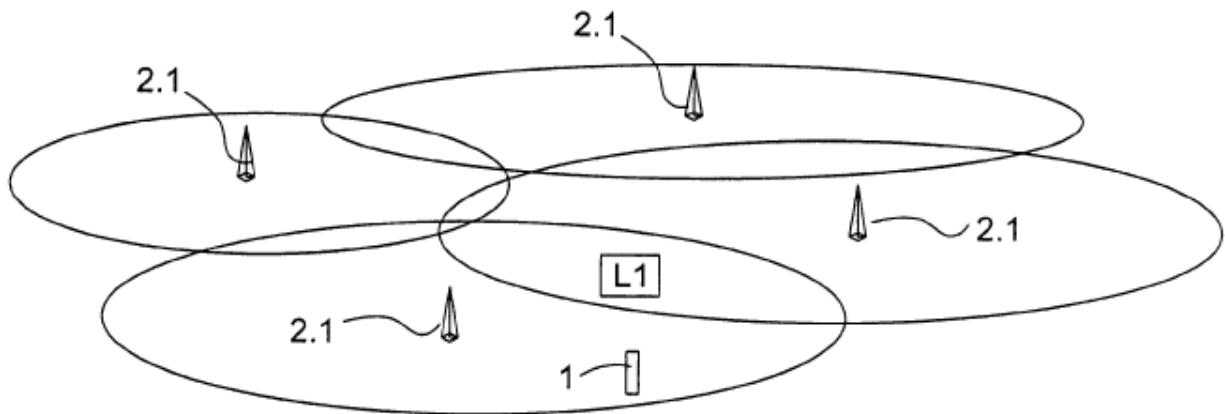


Fig. 1b

87. *Blomqvist* thus discloses that location determination does not need to occur at all times and instead can occur less frequently at appropriate locations based on cell ID information. (*Id.*, 2:20-3:19.)

88. *Blomqvist* also discloses an application for a device 1 (mobile phone) that utilizes a reminder service. (*Id.*, FIG. 1, 5:10-37.) After the location of the device has been determined and “[w]hen the application has received information on the arrival in the determined location, the application implements the determined function, for example presents a message in text format.” (*Id.*, FIG. 1, 5:10-37.) *Blomqvist* also discloses that “[o]ther functions to be mentioned in this context that can be activated on the basis of the location are starting of a program.” (*Id.*, 5:46-

60.) Thus, the mobile device 1 is configured to start a program or perform another function when a mobile device is a specified location. (*Id.*, FIG. 1, 5:10-60.)

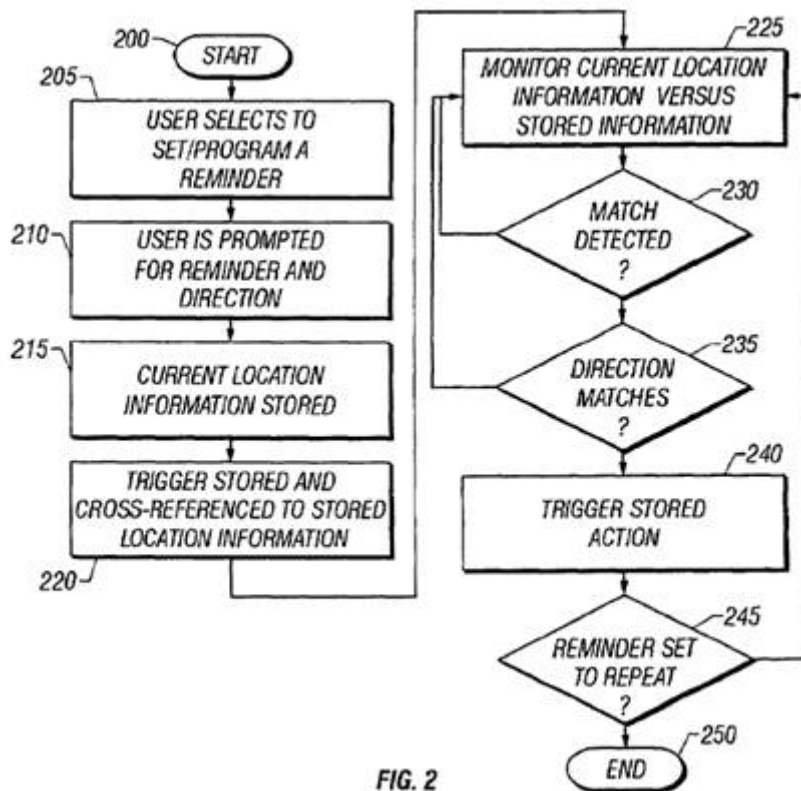
F. *Hunzinger* (Ex-1054)

89. I understand that *Hunzinger* is an issued United States patent. (Ex-1054, Cover.) My understanding is that *Hunzinger* was filed November 15, 2001, and issued October 18, 2005. (*Id.*) For purposes of my analysis, I have been asked to assume *Hunzinger* is prior art.

90. *Hunzinger* discloses a location determining system/process where a user of a mobile device may set actions/alerts/reminders, etc. that are performed based on a determined location of the device.

A system allows users of wireless mobile terminals to set reminders, alerts, or other actions to be triggered based on location or dynamics. Such location information may include, but is not limited to, a specific location description such as latitude, longitude and a radius describing a generally circular region in which the terminal is located. The system monitors the location information until the programmed conditions are satisfied. Once the location condition is satisfied the system of the present invention triggers the programmed reminder.

(Ex-1054, Abstract; *see also id.*, FIGS. 1A-4, 1:38-2:6, 2:10-44, 3:4-67.) Figure 2 (which I show below) exemplifies a process for location reminder programming, monitoring and triggering procedures, executed on the mobile device that can have “position location technology.” (*Id.*, FIG. 2, 3:49-55.)



91. Location related information (“‘remembered’ locations”) and trigger or action information is stored in the mobile device, which also has position-monitoring functions that “compares one or more ‘remembered’ locations with current location information.” (*Id.*, 2:56-60.) The user may use a stored or current location, and the device can use location information such as “station ID...other signal conditions...or

other location identifying information” where it is “only necessary that information allow the terminal to *recognize whether or not it has left or returned to the same location.*” (*Id.*, 4:1-12.) Location information can include a “set area [that] may be defined several ways: a point with a radius, network parameters, a geographic geometric shape, etc.” but “it is not necessary that the mobile [device] knows the exact location...as long as it can store and recognize it.” (*Id.*, 4:12-18.) “The *location area characteristics may be settable by the user* or be adapted according to the precision, accuracy or availability of location information.” (*Id.*, 4:18-20.)

92. The mobile device “stores the location trigger and action information and a reference to the current location 220” so that it can monitor “the current location until it is outside of the ‘set’ location area.” (*Id.*, 4:21-24.) For instance the mobile may detect it has transitioned out of the area described by the stored location information or that the current location matches the stored location information 230. (*Id.*, 4:24-31.) Thus, where the mobile device “exit[s] the location, it may not trigger the stored action but rather return[s] to continue monitoring...until the current location again matches or is similar to the stored location.” (*Id.*, 4:21-38, 4:44-46 (triggering stored action when detecting device has “reentered the vicinity of the stored-location, i.e., entering the location described by the stored location information”).) (*See also id.*, 4:51-5:22.)

93. Figure 4 (which is annotated below) depicts exemplary user interface features associated with a user controlled options for programming location actions to be executed when a programmed reminder is triggered based on a corresponding location. (*Id.*, 5:22-40.)

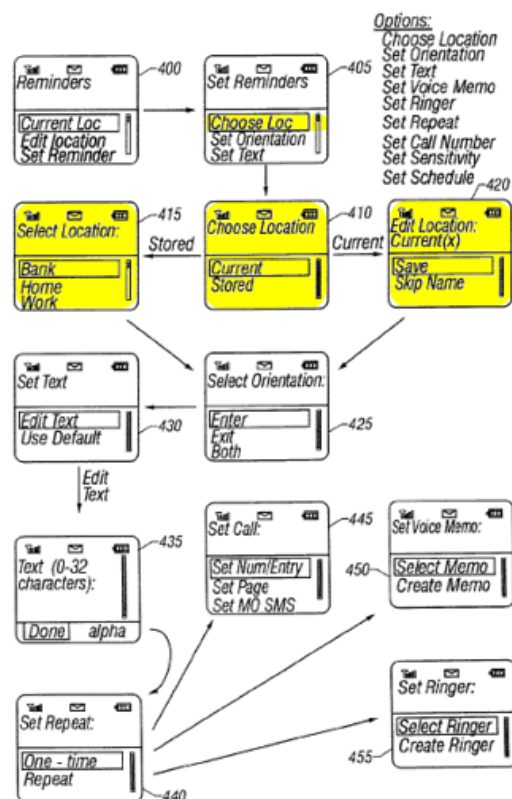


FIG. 4

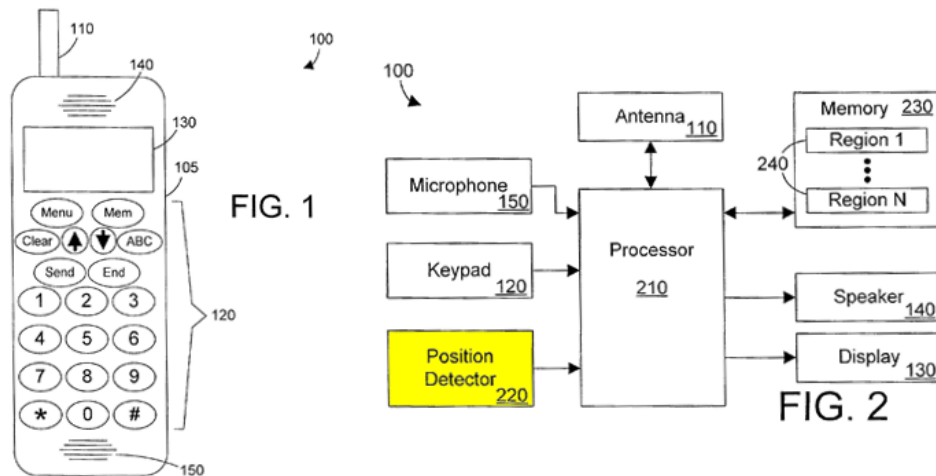
As highlighted above, the “user may select the current location and provide a text name to be associated with it 420.” (*Id.*, FIG. 4, 5:51-52.) The “user may also selected to be reminded only upon leaving an area or entering an area independently or exclusively.” (*Id.*, 5:53-61.) The reminder action can take many forms, including

displaying a text message, voice memo play-back, call to a number, playing a ringer, download information/content, etc. (*Id.*, 5:62-6:7.) *Hunzinger* also discloses that location precision and accuracy can be improved “through multiple measurements or through refinement of the measurements” including “averaging multiple measurements or fixes [as] is *well known in the art.*” (*Id.*, 6:8-22.)

G. *Bates* (Ex-1212)

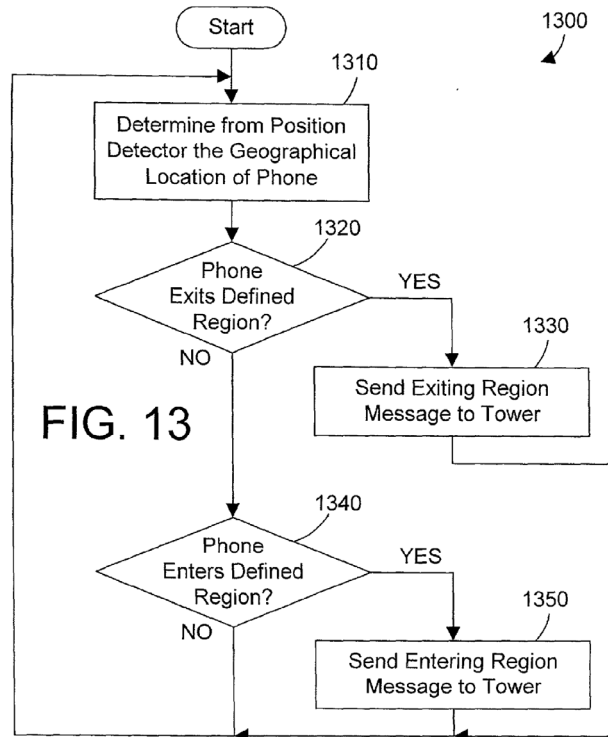
94. I understand that *Bates* is a United States patent application publication. (Ex-1212, Cover.) My understanding is that *Bates* was filed January 12, 2001, and was published December 27, 2001. (*Id.*) For purposes of my analysis, I have been asked to assume *Bates* is prior art.

95. *Bates* discloses systems/processes relating to location services for mobile devices. (*Id.*, Abstract, FIGS. 1-2, 13, ¶¶0003-0007.) Specifically, *Bates* discloses features where a mobile device may determine its location (using a position detector element 220). (*Id.*, FIGS. 1-2 (below), ¶0034.)



96. *Bates* noted that “[m]odern life” made it “desirable for the location of a portable phone to affect how other land-based phones or other portable phones function.” (*Id.*, ¶0006; *id.* ¶0005.) “For example, when a user of a portable phone takes the phone home, it may be *desirable for a call to the portable phone to ring the user’s home phone instead*, thereby avoiding wireless charges during the call.” (*Id.*, ¶0006) And “[w]ithout a way for a portable phone to change the function of other phones based on its geographical position,” *Bates* discloses that “the power of using portable phones [would] not fully be realized.” (*Id.*)

97. Thus, *Bates* describes features where a mobile device is configured determine its location and send information to a remote location information reporting as it enters/exits defined locations/regions. (*Id.*, FIG. 13 (below), ¶¶0022, 0048.)



98. The remote location (call tower) determines how to forward phone calls based on the received location information and maintained phone parameters. (*Id.*, ¶0049.) “For example, when the portable phone 100 is at home 710, the call router 750 could **route calls to the portable phone 100 to the home phone 712 without the portable phone 100 ringing, ...**” etc. (*Id.*, ¶0044; *id.*, ¶0043 (“home phone 712 that is a land-based phone...as is known in the art”).) “Other variations” (*e.g.*, forwarding portable phone calls to a “land-based” work phone) were also envisioned and could be “easily programmed into the phone parameters that dictate the function of the portable phone and other phones according to the self-detected geographical position of the portable phone.” (*Id.*, ¶¶0042-0044, FIGS. 7, 9, 11.)

99. *Bates* further discloses/suggests features where the landline telephone would be within proximity of a device-specific target location because portable phone 100 is close to the location of the landline (*e.g.*, home 710 or work 730) when call forwarding is activated in order to allow the user to pick up calls on the local landline. (*Id.*, FIGS. 7, 9, 13, ¶¶0042 (“ring a single phone...when a portable phone is within or outside of a defined region”), ¶¶0043-0044; *id.*, FIGS. 4-6, 13, ¶¶0036-0042.) Figures 7, 9, and 11 (below) illustrate such exemplary configurations contemplated by *Bates* where a portable phone may be within proximity of a device-specific target location and forward calls to a home/work landline in the same location. (*Id.*, FIGS. 7, 9, 13 (below), ¶¶0042-44.)

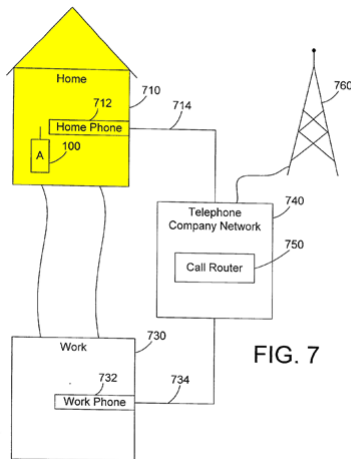


FIG. 7

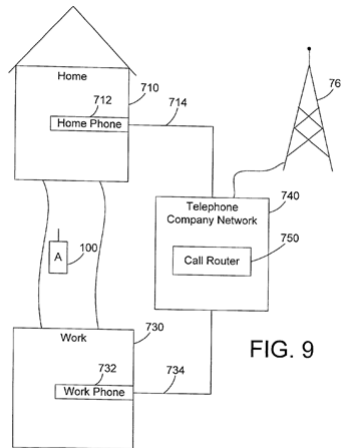


FIG. 9

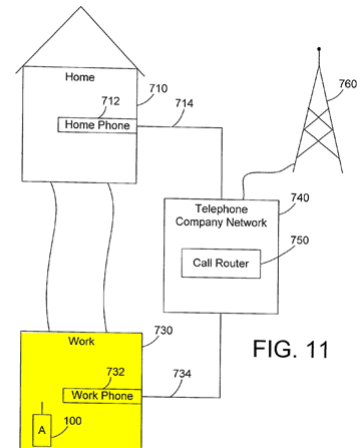


FIG. 11

IX. THE PRIOR ART DISCLOSES OR SUGGESTS ALL RECITED FEATURES OF CLAIMS 1, 4, 5, 8, 14-15, 18-19, 22, 24-25, AND 28 OF THE '811 PATENT

100. Below I provide a summary of the prior art combinations that I address in more detail below.

- *Spain-I* in view of *Hunzinger* and *Nanda* discloses and/or suggests the features of claims 1, 8, 14, 15, 22, and 28;
- *Spain-I* in view of *Hunzinger*, *Nanda*, and *Blomqvist* discloses and/or suggests the features of claims 4 and 18;
- *Spain-I* in view of *Hunzinger*, *Nanda*, and *Tiwari* discloses and/or suggests the features of claims 5 and 19;
- *Spain-I* in view of *Hunzinger*, *Nanda*, and *Othmer* discloses and/or suggests the features of claim 24; and
- *Spain-I* in view of *Hunzinger*, *Nanda*, and *Bates* discloses and/or suggests the features of claim 25.

A. *Spain-I* in View of *Hunzinger* and *Nanda* Discloses and/or Suggests the Features of Claims 1, 8, 14, 15, 22, and 28

1. Claim 1

[pre]A method of determining whether a portable RF communications device is present at a device-specific target location, the method comprising: with the portable RF communications device automatically:

101. I have been asked to assume that the preamble of claim 1 is limiting. Under that assumption, it is my opinion that *Spain-I* (including its incorporated disclosures)⁵ (and including as modified below) discloses and/or suggests these limitations. (See my below analysis in §§IX.A.1(a)-(c) and above in §VIII.A.)

102. *Spain-I* discloses a “method for determining the location of MU 10 which (a) works in areas where GPS coverage is not typically available, and (b) does not require any infrastructural modifications.” (Ex-1011, 3:35-41.) A mobile unit (“MU”) (*e.g.*, “a first portable RF communications device”) that is operable to perform location-determining processes to determine whether the MU is at a particular location based on signal comparisons (*e.g.*, “signal-comparison based location-determining method”) where the MU works in conjunction and communicates with a plurality of fixed-location service-area antenna stations substantially continuously operating and capable of RF communication with the MU. (Ex-1011, FIGS. 1-2 (annotated below), 9-10, 1:18-49, 3:5-34, 3:35-41 (“new method for determining the location of MU 10 which (a) works in areas where GPS coverage is not typically available, and (b) does not require any infrastructural

⁵ See my above analysis in §VIII.A (discussing how the disclosures of Exhibits 1005, 1009–1010, 1012–1015 are part of the disclosure of *Spain-I*).

modifications”), 3:41-4:63, 5:20-6:34, 7:58-8:44, 9:25-13:15, 13:16-14:37, 15:19-35; *see also* Ex-1005 (*Rao*), FIGS. 1-2, FIGS. 4-5, Abstract, 1:26-34, 1:40-57, 2:8-11, 2:33-36, 2:30-3:9, 3:29-61, 4:59-63, 5:40-56; Ex-1010 (*Perez-Breva-I*), Abstract, FIGS. 1-2, 5-10, 1:10-60, 2:23-5:41, 7:1-54, 8:42-11:29; Ex-1009 (*Perez-Breva-II*), Abstract, FIGS. 1-2, 9-10, 1:14-64, 2:25-6:50, 7:4-8:14, 8:46-11:17; *see my below analysis in §§IX.A.1(a)-(b).*)

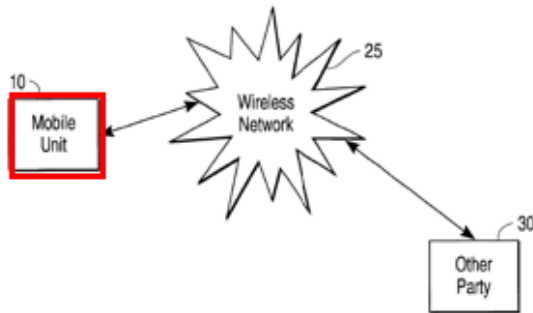


FIG. 1

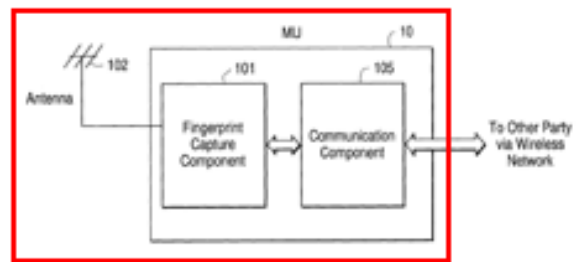


FIG. 2

(Ex-1011, FIGS. 1-2 (annotated to exemplify a MU in red (where in FIG. 2 the antenna 102 is as an example included with such a RF portable communications device))).)

103. *Spain-I* explains that:

- The MU communicates with base stations during operation. (Ex-1011, FIGS. 1-2, 3:9-4:6, 7-22 (“the communication link between the mobile unit and location server is through the base stations and base station controllers of the cellular network”), 1:25-28 (“cell from which the

mobile unit is communicating”), 10:35-41 (“cell sites, Cell Site A, Cell Site B, and Cell Site C, that are responsible for providing service to the mobile units”), 11:57-65 (“Cell A is the serving cell (*i.e.*, the cell currently handling the communications traffic to and from the mobile)”.)

- When at selected location(s), the MU performs processes that collect/measure information including signal strengths associated with communication signals received from antenna stations within RF communication in range of the MU capable of RF communications with the mobile device while at those location(s). (*Id.*, 3:42-4:63, 5:20-6:8, 7:58-8:8, 10:43-46, 11:41-46, 13:16-14:37, FIGS. 9-10; Ex-1005, 4:16-37, 5:40-56, 6:34-51; Ex-1010, 3:4-4:9, 4:32-44, 4:63-5:24, 7:1-18, 10:4-32; Ex-1009, 2:61-5:21, 7:40-57, 9:15-10:37.)
- The MU creates and stores fingerprints based on the collected/measured information, including station identifier information and measured signal strengths corresponding to the received communication signals from the stations. (Ex-1011, FIG. 4 (station IDs, signal strengths), 3:41-4:6, 4:5:20-6:30, 7:58-8:8, 10:48-11:26, 11:41-46, 13:16-55; Ex-1005, 3:29-61, 4:23-27, 4:59-5:9, 5:40-

6:12, FIG. 4, Ex-1009, FIG. 9 (station ID and signal strengths), 5:1-21, 7:4-21, 9:15-54; Ex-1010, FIG. 9, 5:5-57, 7:1-36, 9:10-49.) A collection of the fingerprint structures may be stored in a fingerprint database used for subsequent location-determination processes, where the database may be stored locally on the MU or remotely. (Ex-1011, FIG. 10, 5:61-66, 6:9-32, FIG. 3, 10:48-11:27, 13:56-14:37, Ex-1005, FIG. 5, 6:13-61; Ex-1009, 9:55-10:47; Ex-1010, FIG. 9, 9:50-10:32.)

- Later, “when a location estimate of the MU is desired (either by itself or by the Other Party)” where the MU is at particular location (*e.g.*, which can be one of the same specific fingerprint locations stored in the database), “it [MU] activates component 101 (FIG. 2), which captures predetermined information from a predetermined portion of the RF spectrum.” (Ex-1011, 4:42-46; Ex-1005, 3:29-39; Ex-1009, 3:60-63; Ex-1010, 3:56-60.) The MU creates a fingerprint associated with a current monitored location by measuring *e.g.*, signal strengths received from identified service stations. (Ex-1011, 5:20-6:8, 7:64-8:44, 9:25-10:27, Ex-1005, 3:29-4:24; Ex-1009, 3:63-4:44, 5:7-21; Ex-1010, 3:60-4:44, 5:5-19.) The fingerprint may be generated “using *many different parameters*, either *individually or in combination*.” (Ex-1011, 4:55-

56; Ex-1005, 3:40-42; Ex-1009, 4:4-5; Ex-1010, 4:1-2.) This includes *signal strengths* of received signals and “the identity of the signal source (*e.g.*, channel number of *station code*)” (Ex-1011, FIG. 4, 4:56-63; Ex-1005, 3:42-49; Ex-1009, 4:6-11, Ex-1010, 4:3-8.) Indeed, the MU is “equipped with appropriate circuitry to determine the strength of the received signal” and the “location of the transmitter is broadcast in the signal and is extracted in the MU” (Ex-1011, 5:28-32, 3:55-58, 5:20-28 (MU captures signals and their parameters); Ex-1005, 3:57-61, 4:16-18; Ex-1009, 3:7-24, 4:34-44; Ex-1010, 3:4-21, 4:32-44.)

104. The MU performs processes to determine whether the MU is currently “at a particular location or not” (Ex-1011, 4:23-25⁶; Ex-1005, 3:10 18.) To do so, the MU compares the fingerprint information for the current monitored location with the previously generated/stored fingerprint information to determine a “closest” match. If the compared information matches (or is close), the MU determines the MU is at or near the location associated with the matching fingerprint in the database.

⁶ *Spain-I* discloses that the MU can initiate the location estimate processes (Ex-1011, 4:43–47 (“location estimate of the [MU] is desired (either by the [MU] itself or by the location server)”).)

Spain-I discloses various processes for determining closeness between compared fingerprint information (*e.g.*, signal strengths corresponding to associated station IDs, etc.) and for making such analysis more efficient. (Ex-1011, FIGS. 9-10, 5:61-6:8, 7:58-67 (signal strength parameters and dynamic changes for fingerprints), 8:1-26 (processes for determining closest matching fingerprint), 8:27-10:27, 10:29-13:15 (processes for reducing set of fingerprint information for comparison), 14:10-37 (measuring signal characteristics at predetermined locations and interpolating fingerprints between “sampled locations”), 17:15-19; Ex-1005, 3:29-4:37, 4:65-5:9, 5:10-40, FIGS. 4-5, 5:40-6:47, 6:48-61; Ex-1009, 3:40-4:46, 5:1-21, 7:4-9:14, *see also id.*, 5:44-7:3; Ex-1010, 3:37-4:44, 4:64-5:19, 7:1-9:10.)

105. It is thus is my opinion that *Spain-I*, including as modified below, discloses or suggests features like that claimed and/or described in the '811 patent. This is illustrated by comparing my above discussions with Exhibit 1001 where steps (A) and (B) involving “registering/recording” (*id.*, 6:4-13) bear resemblance to *Spain-I*’s construction of a fingerprint database using signal strengths from multiple stations. Furthermore, step (C) involving “monitoring” (*id.*, 6:14-18) in the '811 patent is akin to *Spain-I*’s process of measuring and using signal strengths to create a fingerprint at a monitored location. Lastly, step (D) related to “determining” (*id.*, 6:19-23) in the '811 patent aligns with *Spain-I*’s method of comparing fingerprint

information for recorded database fingerprints with the current mobile unit location fingerprint to determine if the mobile unit is “at the selected location” of a matching fingerprint.

106. The mobile unit (MU) is equipped with components and software designed to execute or enable these functions, which are therefore understood to be carried out automatically. (Ex-1011, FIG. 2, 3:55-4:22, 5:20-32, 15:19-25.) Therefore, for the reasons I discussed above and those discussed below, it is my opinion that the MU in the modified *Spain-I* system and/or processes would have automatically executed processes for determining whether the MU is present at a device-specific target location like each of the steps in limitations 1(a)-(c) of the method recited in claim 1. (§§IX.A.1(a)-(c); *e.g.*, IX.A.1(b)(5).) For example, it is my opinion that *Spain-I* (including as modified below in view of *Hunzinger* and *Nanda*) discloses/suggests the “device-specific target location” and “with the portable RF communications device automatically” limitations for the reasons above and those explained below in §§IX.A.1(b)-(c) (explaining how the *Spain-I-Hunzinger-Nanda* system/processes would allow a MU user to choose device-specific target locations associated with collected/measured signal strength fingerprint information, etc. §IX.A.1(b)(1)) and automatically receiving signals, detecting location, and performing related actions as recited in claim 1 (*see e.g.*,

§IX.A.1(b)(5)). Thus, for those reasons, (and those above), it is my opinion that *Spain-I* (including as modified below in view of *Hunzinger* and *Nanda*) discloses/suggests limitation 1(pre).

- a) (a) receiving a first plurality of communications signals, each received from one of a first plurality of antenna stations within range of the portable RF communications device, wherein the antenna stations are fixed-location service-area antenna stations and are substantially continuously operating;**

107. It is my opinion that *Spain-I* (including as modified as discussed below) discloses or suggests these limitations. (*See also* my analysis above in §§VIII.A, IX.A.1(pre).)⁷ The MU is configured to perform processes for monitoring its location by receiving signals from a plurality of stations (“fixed-location service-area antenna stations”) (as disclosed or modified as I discuss below and/or IX.A.1(b)(4)) within range of the MU. (*See* my above analysis §IX.A.1(pre); *see* my above analysis §IX.A.1(b); Ex-1201, ¶0094 (“base stations in range of the mobile station”); Ex-1045, 3:17-22 (“the mobile station measures the signal strength

⁷ I have also been asked to assume a scenario wherein *Spain-I* does not disclose features in limitation 1(a). As to that scenario, it is my opinion that a person of ordinary skill in the art would have been motivated to implement such features in view of *Hunzinger-Nanda* for reasons similar to for limitation 1(b) (§IX.A.1(b)).

of each of access points within range”); Ex-1202, ¶0025 (“the receiving range of the mobile telephone 1000”).) (*See also* §IX.A.1(b)(5) (“automatic” features).)

108. For example, *Spain-I* discloses that “[w]hen a location estimate of the mobile unit is desired (either by the mobile unit itself or by the location server), it activates component 101 (FIG. 2), which captures predetermined information from a predetermined portion of the RF spectrum” from stations that are within range of the MU. (Ex-1011, 4:42-46; Ex-1005, 3:29-39; Ex-1009, 3:60-63; Ex-1010, 3:56-60.) The MU creates a fingerprint for that current location based on the received signal information, which includes signal strength. (Ex-1011, 3:55-58 (MU determines “the strength of the received signal”), 4:55-63, 5:20-6:8, 6:9-30 (MU capturing fingerprint of “current location”), 7:64-8:44, 9:25-10:27, 13:16-33, FIGS. 9-10; Ex-1005, 3:29-4:24; Ex-1009, 3:7-4:44, 5:7-21; Ex-1010, 3:4-4:44, 5:5-19; §IX.A.1(pre).) The fingerprint may be generated “using *many different parameters*, either *individually or in combination*.” (Ex-1011, 4:55-56; Ex-1005, 3:40-42; Ex-1009, 4:4-5; Ex-1010, 4:1-2.) This includes *signal strengths* of received signals. (Ex-1011, FIG. 4, 4:56-63; Ex-1005, 3:42-49; Ex-1009, 4:6-11, Ex-1010, 4:3-8.) The MU obtains “multiple pieces of information or from multiple portions of the [RF] spectrum” from the communication signals received from surrounding stations in range. (Ex-1011, 3:55-58, 4:43-54, 5:20-22; Ex-1005, 3:29-37, 3:4-9.) The MU

is “equipped with appropriate circuitry to determine the strength of the received signal” and the “location of the transmitter is broadcast in the signal and is extracted in the MU.” (Ex-1011, 5:28-32, 3:55-58, 5:20-28 (MU captures signals and their parameters); Ex-1005, 3:57-61, 4:16-18; Ex-1009, 3:7-24, 4:34-44; Ex-1010, 3:4-21, 4:32-44.) The MU creates a fingerprint associated with a current monitored location by extracting station ID information and measuring *e.g.*, signal strengths received from identified service stations (varying signal characteristic other than ID). (Ex-1011, 5:20-6:8, 7:64-8:44, 9:25-10:27, Ex-1005, 3:29-4:24; Ex-1009, 3:63-4:44, 5:7-21; Ex-1010, 3:60-4:44, 5:5-19.)

109. The MU obtains “multiple pieces of information or from multiple portions of the [RF] spectrum” from communication signals from a source (*e.g.*, station). (Ex-1011, 3:55-58, 4:43-54, 5:20-22; Ex-1005, 3:29-37, 3:4-9.) The MU is capable of capturing information from the received signals and is “equipped with appropriate circuitry to determine the strength of the received signal.” (Ex-1011, 5:28-32, Ex-1005, 3:57-61.)

110. As I discussed above for limitation 1(pre), when at a current monitored location (*e.g.*, a location from where the MU initiates a location determination process), the MU captures information from the RF spectrum to create fingerprint information based on *parameters (individually or in combination)*, such as *signal*

strength measurements. (Ex-1011, FIGS. 9 (below)-10, 4:55-63 (fingerprint may use different parameters (“individually or in combination”) (*e.g.*, signal strengths and station ID)), 5:20-32, 5:33-6:8, 7:64-8:44, 9:25-10:27, 13:16-33, Ex-1005, 3:29-61, 5:51-56; Ex-1009, 4:4-11; Ex-1010, 4:1-8.) Figure 9 (below) exemplifies a fingerprint structure, which is generated by “receiving a first plurality of communications signals, each received from one of a first plurality of antenna stations within range of the portable RF communications device” (yellow), like that claimed.

400	Fingerprint Structure					
401	Time of Capture:					
403	Station ID:	I1	I2	I3	...	In
405	Frequency:	F1	F2	F3	...	Fn
407	Tuning Parameters:	P1	P2	P3	...	Pn
409	Transmitter Location:	L1	L2	L3	...	Ln
411	Signal Strength 1:	S11	S12	S13	...	S1n
413	Signal Strength 2:	S21	S22	S23	...	S2n
415	...	...	...	...	...	...
417	Signal Strength m:	Sm1	Sm2	Sm3	...	Smn

Fig. 9

(Ex-1011, FIG. 9 (measured signal strengths (yellow) for signals received from a plurality of stations (Station ID1-In)); *id.*, 3:42-54, 4:33-36, 7:58-8:8, 13:51-44 (sampling multiple times); Ex-1005, 2:40-52, 3:57-61, 4:59-5:9.)

111. “Each column in FIG. 9 is information pertaining to a particular frequency or carrier. A Station ID field 403 indicates the unique identifying code of a broadcasting station from which the signal emanated” and may be “filled by the MU using information received in the signal.” (Ex-1011, 5:20-32, 5:55-60, 13:27-33 (MU extracts parameter information from signal and determines strength of received signal for generating fingerprint); Ex-1005, 3:57-61, 4:16-21, 5:51-64.)

112. Figure 9 further exemplifies the results of how the MU obtains station ID information and measures signal strengths for the signals received from surrounding antenna stations in range when the MU is at a current location (and also does similar operations when at device-specific target location as I discuss below in §IX.A.1(b)). For instance, a person of ordinary skill in the art would have understood that each fingerprint structure can include multiple signal strength number(s) (SS1-SSm) which were measured by the MU from signals received from respective stations. Such a skilled person would have understood that signal strengths may vary, as known in the art. (Ex-1011, 3:42-54 (signal characteristics vary across RF spectrum but for any given location, preselected signal parameters

may be measured unique to that location), 7:58-8:8, (capturing fingerprints at different times to minimize interference with other stations), 13:51-44 (signal strength sampled multiple times for each frequency/carrier and filled in by MU); Ex-1005, 2:40-52, 4:59-5:9, 6:7-12; Ex-1006, Abstract, 7:19-28 (signal strength “vary because of environmental variability”), 10:19-22⁸.)

113. Accordingly, for reasons above and below *Spain-I* discloses the MU monitoring its location by (for example):

- “receiving a first plurality of communications signals, each received from one of a first plurality of antenna stations within range of the portable RF communications device, wherein the antenna stations are fixed-location service-area antenna stations and are substantially continuously operating” (see my above analysis; *e.g.*, Ex-1011, FIGS. 1-3, 9-10, 6:9-30 (MU capturing fingerprint of its “current location”), 3:5-16, 3:42-4:62, 5:55-6:8, 13:29-49; Ex-1005, FIGS. 1-4, 1:40-54,

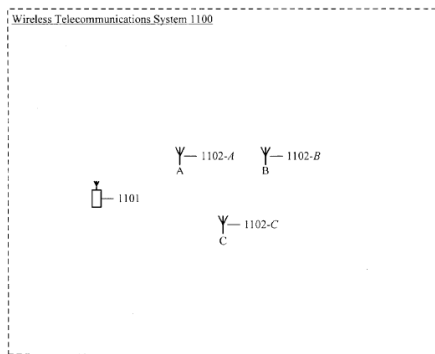
⁸ Ex-1006 (*Nanda*) is referenced here to demonstrate a person of ordinary skill in the art’s state-of-art knowledge at the time. *Nanda* is also relied upon below as an asserted reference for other claim features. (See my below analysis §IX.A.1(b).)

2:5-16, 2:32-3:5, 3:29-4:22, 4:38-50; *see* my above analysis in §§VIII.A, IX.A.1(pre).)

114. A person of ordinary skill in the art would have understood in the context of *Spain-I* that the “station(s)” providing the communication signals received by the MU are substantially continuously operating fixed-location service-area antenna stations, like that claimed since that they include base stations that communicate with the MU using RF communication signals within respective service areas, consistent with known wireless network infrastructures. For example, such a skilled person would have understood that *Spain-I* recognizes that any location has a unique RF spectral fingerprint, and the MU includes an antenna that is configured to receive RF signals from signal sources (stations) in a wireless communication network consistent with that known in the art. (Ex-1011, FIG. 2, 4:7-22 (MU antenna 102 and communication link between MU and location server is “though the base stations...of the cellular network”); *id.*, 3:42-4:6, 1:18-48 (discussing conventional cellular “base stations”), 3:55-4:6 and 7:58-67 (television/radio broadcast stations), 5:33-54 (television signals having “better coverage of the cell than other signals”), 4:59-61 (station code identifying signal source), 13:27-31 (“Station ID field 403 indicates the unique identifying code of a broadcasting station from which the signal emanated”), FIG. 9, 6:31-39 (“base

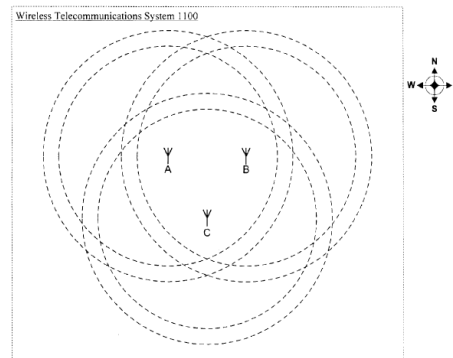
station signal strengths”); Ex-1005, 1:10-19, 1:26-34, 2:40-3:3, 3:4-9, 3:50-61, FIGS. 2, 4, 4:59-63, 5:51-56; Ex-1009, 3:25-39, 4:9-10, 5:44-51, 7:4-21, 9:26-54; Ex-1010, 1:31-41, 3:22-36, 4:1-7, 5:46-49, 7:1-18, 9:21-49.) Such a skilled person would have understood, by the MU having an antenna to receive the communication signals, that the source of such signals (*e.g.*, stations) would likewise have antennas to transmit the RF signals from which the MU measures corresponding signal strengths. Indeed, *Spain-I* discusses coverage areas served by antenna base stations that communicate RF signals with a MU in the context of processes for reducing fingerprint samples for comparison. (Ex-1011, FIGS. 11, 14 (below), 12-13, 15-19, 10:29-13:15.)

FIG. 11



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FIG. 14



115. A person of ordinary skill in the art would have recognized such discussions of antenna base station coverage areas are applicable to the features relating to the location-determination processes performed by the MU in terms of the signal sources (*e.g.*, antenna stations) as discussed above (and below) regarding

Spain-I. (See also my below analysis in §IX.A.1(b).) Such communication-related operations were consistent with known wireless network infrastructures similar to those described by *Spain-I*. (Ex-1007, ¶¶0185 (describing wireless cell sites including base stations 122 that are “standard high traffic, fixed location base stations used for voice and data communications with a plurality of MSs 140” (mobile stations (*id.*, ¶0183))), 0237 (described a based station as a fixed BS 122).) Consistent with such understandings, it is my opinion that a person of ordinary skill in the art would have understood the “station(s)” in *Spain-I* to be fixed and serve particular areas using an antenna to facilitate wireless communications with the MU when in the coverage/service area for that station, consistent with conventional wireless network infrastructures. (Ex-1007, ¶¶0009-0020, 0032, 0053, 0193, FIG. 3, 236, 250.) Accordingly, a person of ordinary skill in the art would have understood the stations described by *Spain-I* are fixed-based service area antenna stations like those claimed.

116. For similar reasons, a person of ordinary skill in the art would have understood the fixed-location antenna “stations” described by *Spain-I* would have been **substantially continuously operating** in order for wireless communications and related signal strength measurement processes to take place as described by *Spain-I*, consistent with the operation/functions of such conventional networks and

associated equipment/components in order to provide the wireless communications used to facilitate the location-determining processes as described by *Spain-I*. The system operates in, or works with, a conventional wireless network with base stations, and without such substantially continuous operation, the location-determining processes disclosed by *Spain-I* would not perform as disclosed. For example, without the stations operating substantially continuously operating, RF communications would not be performed as known in such wireless systems, and thus, for example, measured signal strengths may become stale, which may compromise the integrity of the location determining process described by *Spain-I*. *Spain-I* looks to provide accurate location determinations based on the signal parameters (e.g., station IDs and signal strengths). (See my discussions of *Spain-I* above; e.g., Ex-1011, 8:1-8, 9:64-67, 10:64-67, 13:16-55, 14:1-3.) As such, *Spain-I* discloses substantially continuously operating fixed-location service-area antenna stations that communicate RF signals with the MU and are “substantially continuously operating,” as claimed.

117. Nonetheless, I have also been asked to assume a scenario wherein *Spain-I* does not disclose such features. As to that scenario, it is my opinion that a person of ordinary skill in the art would have been motivated to configure *Spain-I*'s MU system and related processes to operate in conjunction with “substantially

continuously operating” “fixed-location service-area antenna stations” that communicate RF signals with the MU consistent with conventional wireless network infrastructures like those described by *Spain-I*. Such a skilled person would have understood from the disclosures in *Spain-I*, and based on their knowledge/experience in the art, that the infrastructure in which the MU operates includes conventional wireless networking technologies/techniques. (Ex-1011, 1:16-50, 3:8-54, 10:34-11:26; Ex-1007, FIG. 3, ¶¶0009-0020, 0032, 0053, 0193, 236, 250; Ex-1027, FIGS. 1-2, 16, ¶¶0002-0021, 0042-0045, 0102-0103.) *Spain-I* discusses conventional mobile communications technologies that include wireless cells (Ex-1011, 1:18-49; Ex-1005, 1:8-37), operations in portions of the RF spectrum including television and radio transmission signals (Ex-1011, 3:55-4:6; Ex-1005, 2:53-3:3) and cellular communication networks (Ex-1011, 4:7-22, 5:33-51, Ex-1005, 3:62-4:12, 5:28-33), all known to operate with substantially continuously operating antenna stations providing wireless communications to mobile devices. Accordingly, for the scenario where *Spain-I* does not teach such antenna station features, a person of ordinary skill in the art would have understood such features were suggested and a skilled person would have been motivated to configure *Spain-I*'s processes and system(s) to operate in conjunction with such fixed-location service-area antenna stations from which communication signals were received by

the MU and processed in accordance with *Spain-I*'s disclosed processes. Such a skilled person would have had the knowledge and skills to configure, and a reasonable expectation of success in implementing, such features to facilitate wireless communications like those discussed by *Spain-I*, especially where such configuration/implementation would have involved known technologies and techniques within the skills and knowledge of a person of ordinary skill in the art. (Ex-1011, 1:16-50, 3:8-4:22, 5:33-51, 10:34-11:26; Ex-1005, 1:8-37, 2:53-3:3, 3:62-4:12, 5:28-33; *see also* Ex-1007, FIG. 3, ¶¶0009-0020, 0032, 0053, 0193, 236, 250; Ex-1027, FIGS. 1-2, 16, ¶¶0002-0021, 0042-0045, 0102-0103.) A person of ordinary skill in the art was thus well aware of such antenna stations and would have been motivated to configure *Spain-I*'s MU to operate in conjunction with similar continuously operating antenna stations (like those claimed). Indeed, such a skilled person would have understood there was a narrow spectrum of design choices in terms of network antenna stations (in terms of operating substantially continuously). As such, such a person would have not only understood how to implement such features in the *Spain-I* system/processes, but would have understood the advantages and disadvantages associated with various options, and considered them when deciding to configure the system/process with such antenna stations like those claimed. Further, it is my opinion that a person of ordinary skill in the art would

have been motivated to implement such antenna station features for reasons that I explained below in §IX.A.1(b)(4). (*See* also my below analysis in §IX.A.1(b).)

118. Moreover, it is my opinion that a person of ordinary skill in the art would have been motivated to implement such automatic features corresponding to limitation 1(a) for reasons similar to those discussed above (§IX.A.1(pre)) and below (§IX.A.1(b)(5)). (*See* also my below analysis in §IX.A.1(b).)⁹

- b) (b) causing a determination of whether the portable RF communications device is within proximity of the device-specific target location by electronically comparing at least one number based on signal strengths of each of the first plurality of communications signals with at least one number based on corresponding signal strengths of each of a second plurality of communication signals from a second plurality of antenna stations that have been identified as being within range of the same location as the device-specific target location, which signal strengths have been determined for the same location as the device-specific target location; and**

⁹ Even if *Spain-I* were interpreted to not disclose all the features in limitation 1(a), it is my opinion that a person of ordinary skill in the art would have been motivated to implement them in view of *Nanda* and/or *Hunzinger* for reasons similar to those I discuss below for limitation 1(b) (§IX.A.1(b)).

119. It is my opinion that *Spain-I* in view of *Hunzinger* and *Nanda* discloses and/or suggests these limitations. (See §§VIII.B, F.)

120. As I explained, *Spain-I* discloses that the MU performs processes causing a determination whether the MU is currently “at a particular location or not.” (Ex-1011, 4:23-25, 4:43-47 (“location estimate of the [MU] is desired (either by the [MU] itself or by the location server)”); Ex-1005, 3:10-18; §§IX.A.1(pre)-1(a).) To do so, the MU electronically compares fingerprint information for the MU’s current monitored location first communication signals (*e.g.*, where the MU is located when location determination/monitoring is initiated/performed) with previously generated/stored fingerprint information (*e.g.*, generated/collected at particular target location(s) second communication signals (from second antenna stations) stored in a fingerprint database) to determine a “closest” match. (See §§IX.A.1(a), IX.A.1(b).) As I noted, fingerprint information can include station identifier information and signal strength measurement values for communication signals communicated from signal sources surrounding and in range of the MU when the fingerprint information is collected/generated. If the comparison results in a match (or close match as I discuss further below), the MU determines that the MU is at, and/or otherwise within the proximity of, the device-specific location corresponding to the matching fingerprint information in the database. (Ex-1011, 5:55-6:4

(“corresponding location in the database is then chosen as the location of the mobile unit”); 8:1-26; *see also* my discussions above in §IX.A.1(pre)-1(a).)

121. Accordingly, the second antenna stations, which transmit the second signals utilized for creating fingerprints in the database, would have been recognized as operating within the range of the same location as the target location similar to that claimed and described in the specification and file history. (Ex-1001, 6:4-23; Ex-1004, 126-139; §IX.A.1(b)(1)-(3); *e.g.*, analysis in §IX.A.1(b)(2).) The first antenna stations (and corresponding first signals) are related to those communicating with the MU when at the monitored target location (§IX.A.1(a)), and the second antenna stations (and second signals) are related to those communicating with the MU when generating signal strength-based fingerprints used to build the database on the MU. When a match occurred, it would mean that identical or overlapping antenna stations were recognized as the source of both the first and second signals, which combined to create the matching fingerprint data.

122. The MU is also configured to perform various processes for determining closeness between compared fingerprint information and making such analyses more efficient. (Ex-1011, FIGS. 1-3, 9-10, 5:61-6:8, 7:58-67 (signal strength number(s) and dynamic changes for fingerprints), 8:1-26 (determining closest matching fingerprint), 8:27-10:27, 10:29-13:15 (discussing features where a

location server aids in the reduction of sample fingerprints to be considered in comparison), 14:10-22 (building fingerprint database built via off-line snapshots at locations), 14:23-31 (building database by taking measurements at predetermined locations and interpolating fingerprints at all locations between *sampled locations*), 17:15-19; Ex-1005, 3:29-4:37, 4:65-5:9, 5:10-40, FIGS. 4-5, 5:40-6:47, 6:34-36, 6:48-51; Ex-1009, 3:40-4:46, 5:1-21, 5:44-9:14; Ex-1010, 3:37-4:44, 4:64-5:19, 7:1-9:10.)

123. A person of ordinary skill in the art would have recognized that *Spain-I* discloses features and processes like those recited in claim 1, including those of limitation 1(b) (*e.g.*, determining whether the MU is at a particular location based on comparing fingerprint information associated with a current monitored location (*see e.g.*, limitation 1(a)) with stored fingerprint information corresponding to device-specific target locations where the MU was at when such information was obtained, etc.) Such suggestions in *Spain-I* provide disclosures that would have led a person of ordinary skill in the art to consider teachings in the art when considering the design, configuration and implementation of *Spain-I*'s system/process for desired applications. As I discuss further below, is my opinion that a person of ordinary skill in the art would have been motivated to configure the *Spain-I* system/processes to implement such features in view of the teachings and

suggestions in *Hunzinger* and *Nanda* and a person of ordinary skill in the art's knowledge and experience at the time regarding the state of art. (See my below analysis in §§IX.A.1(b)(1)-(5); and above in §§IX.A.1(pre-(a)), VIII.B.)

124. It is my opinion that the teachings/suggestions from *Spain-I*, *Hunzinger*, and *Nanda* (and the other prior art I discuss below in other sections) in context of a person of ordinary skill in the art's state-of-art knowledge/skills, etc. at the time, would have guided such a skilled person to design/configure/implement/modify the *Spain-I* system/processes in such a manner that would have predictably led to a system/process that disclose or suggest features like those recited in the challenged claims I address in this Declaration. Therefore, where I make references to any combination or combined system/process involving such prior art (e.g., “combined” *Spain-I-Hunzinger-Nanda* system/process or “combination” or similar language involving any of the prior art I discuss below—including in other sections), that does not mean or suggest that it is my opinion a person of ordinary skill in the art would have bodily incorporated discussed features from one prior art reference into the other. Rather, I use such language as short-hand for the resulting modified *Spain-I* system/process in light of such teachings/suggestions in the prior art from which such a skilled person would have been motivated and guided as I explain in this declaration.

(1) Determining If Device is Within Proximity of the Device-Specific Target Location

125. It is my opinion that *Spain-I* in view of *Hunzinger* and *Nanda* discloses and/or suggests the claimed “causing a determination of whether the portable RF communications device is within proximity of the device-specific target location” as claimed in limitation 1(b), in context of its plain language and related descriptions in the specification (Ex-1001) and in the prosecution file history (Ex-1004).

126. With respect to limitation 1(b), the '811 patent discloses functionalities in which a mobile device determines its location based on a comparison of current location signal strengths with and desired location signal strengths. (Ex-1001, 19:20-38) When the strengths “are identical,” the “cell phone is determined to have returned to the desired location (i.e., current location=desired location)” (*id.*, 19:39-20:26; *id.*, 7:19-36, 9:7-22, 18:46-54; §VII). As documented in the file history, I understand that the applicant associated the claimed “proximity” features to features in the specification: where “upon observing an *identical list of service antennas with substantially identical respective signal strengths*—can reasonably conclude that it is within a predetermined proximity of the original []selected location.” (Ex-1004, 128 (citing now Ex-1001, 9:10-14).) I also understand that the specification’s reference to “selected location” was discussed with respect to the claimed “device-specific target location.” (Ex-1004, 136 (citing now Ex-1001, 6:19-23).) During

prosecution of a parent '698 patent, the applicant stated “the instant application focuses on...determining whether a mobile device is or is not at a specified location (‘am I there?’)” as opposed to “determining where a mobile device is (‘where am I?’).” (Ex-1031, 167; §§VII-VIII.) I thus explain below how *Spain-I* in view of *Hunzinger-Nanda* discloses and/or suggests the claimed device-specific target location proximity features in context of the plain claim language, specification, and file history, including where the “device-specific target location” encompasses locations specifically targeted/selected by a MU user.

127. As I discussed above, a person of ordinary skill in the art would have understood that *Spain-I* describes that the fingerprints generated and stored in the fingerprint database correspond to location(s) that were selected or predetermined. (See my above analysis in §IX.A.1(pre)-(b); Ex-1011, FIG. 9, 3:42-4:63, 5:20-32, 13:49-55 (signal strength sampled multiple times); Ex-1005, 2:40-3:3; 3:57-61, 4:16-21, 4:65-9, 6:7-11.)

128. As I explained, *Spain-I* discloses processes to determine if “MU 10 is at a particular location or not.” (§IX.A.1(pre)-1(b); Ex-1011, 4:23-25; Ex-1005, 3:10-11.) *Spain-I* explains that the desire for obtaining a location estimate can originate from the MU or the location server. (Ex-1011, 4:43-47; Ex-1005, 3:29-31.) To do so, the MU collects fingerprint information (*e.g.*, station IDs) and

measures signal strength(s) associated with the signal(s) received from the plurality of stations corresponding to those IDs in order to build the fingerprint database on the MU. (Ex-1011, 5:20-6:31, 7:58-8:26, 13:16-14:37; Ex-1005, 3:23-6:56.) Fingerprints can be generated (and associated signal parameters measured/collected) based on signals received at predetermined locations. (Ex-1011, 4:42-63, 13:27-33, 14:23-31, Ex-1005, 6:48-51.) A person of ordinary skill in the art would have understood that *Spain-I* at least suggests features where generating fingerprints and building the fingerprint database stems from signal characteristic (*e.g.*, signal strength) measurements and related information collected when the MU was carried by a user to specific locations of the MU.

129. For example, *Spain-I* describes features where a user can request the location of the MU, *albeit* in context of the FIG. 3 embodiment, which uses the location server to store the fingerprint database. (Ex-1011, 6:9-21; Ex-1005, 6:43-46.) “On receipt of the request, the MU captures the fingerprint of its current location,” which is processed and eventually sent to the location server for storage and use in context of the FIG. 3 procedures. (Ex-1011, 6:20-30; Ex-1005, 6:46-47, FIG. 3 (below).)

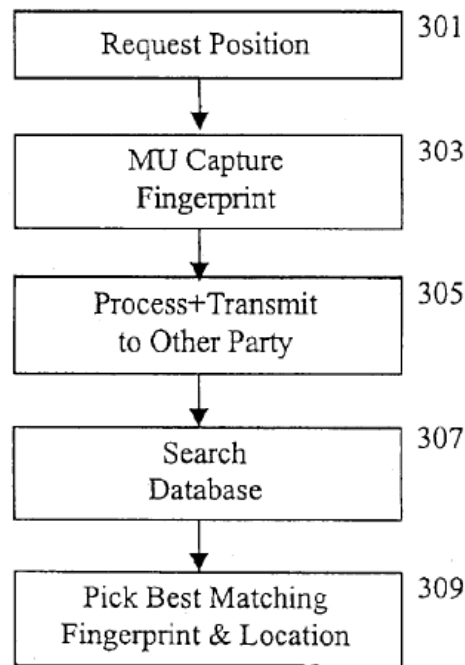


Fig. 3

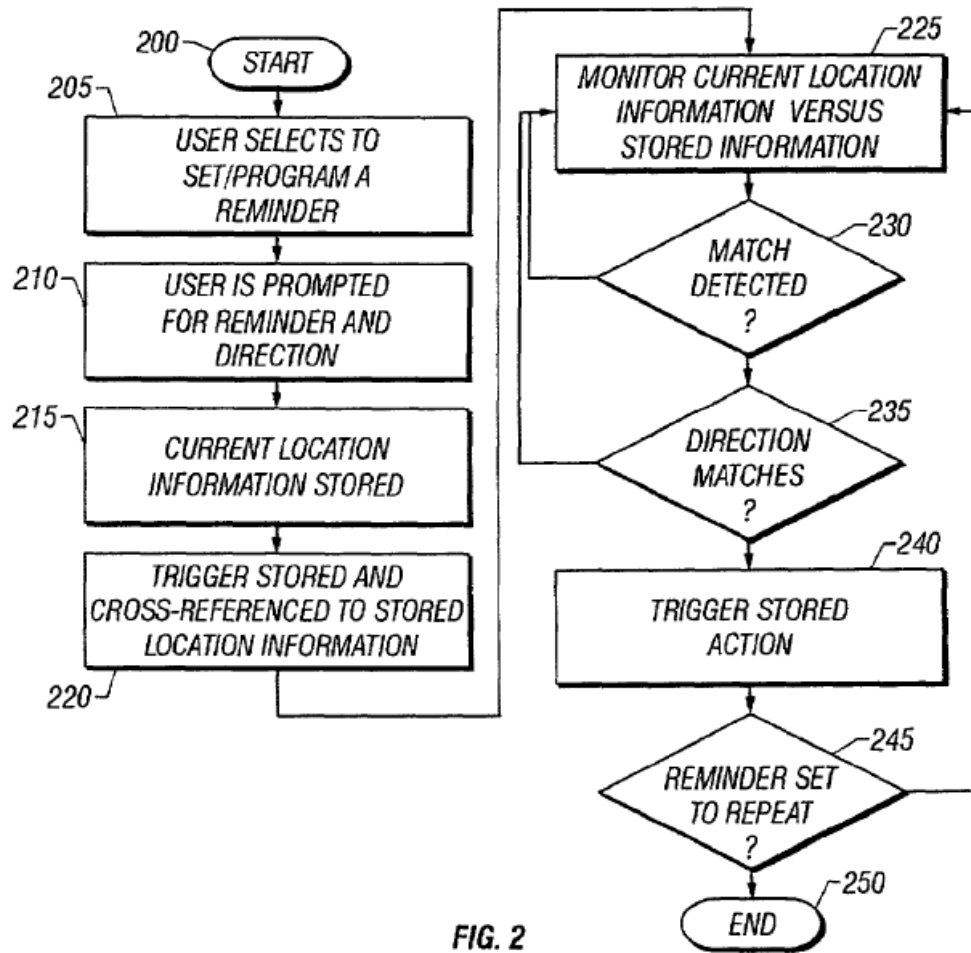
130. While such teachings relate to a remotely stored fingerprint database and performing fingerprint matching processes, they also would have suggested to a person of ordinary skill in the art that the MU may be (or is) configured to receive a user request to measure/collect signal information for generating a fingerprint. *Spain-I* thus suggests the concept generally of user-initiated location-based fingerprint data collection generally and would have taught a person of ordinary skill in the art the context of such features, and thus led such a skilled person to consider the various ways how to provide for device-specific target locations corresponding

to fingerprints in the database. A person of ordinary skill in the art thus would have understood there were numerous ways and reasons for doing so, and thus would have been motivated to consider teachings in the art when considering the teachings of *Spain-I*.

131. For example, the teachings and suggestions in *Spain-I* would have led a person of ordinary skill in the art who was considering/designing/implementing the *Spain-I* system/processes for various applications to consider available ways and options to configure such a system to provide user friendly controls for designating areas/locations and triggering services/actions when the MU enters, is at, or leaves a designated area/location. (See my discussions above in §V.) It is my opinion that such a skilled person would have been motivated to use their state-of-art knowledge and experience, and teachings from the art, when designing, considering, and configuring such a system/processes. In doing so, a person of ordinary skill in the art would have found *Hunzinger* and *Nanda* to be relevant sources of such teachings and guidance. Consequently, such a skilled person would have considered and have been motivated by the teachings of *Hunzinger* (Ex-1054) and those of *Nanda* (Ex-1006) to consider, develop, and configure the *Spain-I*'s system-processes to determine if the MU's current location was in proximity of a device-specific target location, consistent with that claimed (and discussed in the '811 patent and during

prosecution (*e.g.*, am I there)), including providing mechanisms for allowing the user to choose location(s) from which the fingerprint information was collected/measured used to build a device-specific database on the MU and subsequently used for comparison with the current monitored location fingerprint information (as I discussed above and further below in §IX.A.1(b)(2)), and to perform location-based actions/operations selectable by the user, similar to features described by *Hunzinger* and *Nanda*.

132. *Hunzinger* (discussed also above in §VIII.F) discloses a location determining system/process where a user of a mobile device may set actions/alerts/reminders, etc. that are performed based on a determined location of the device and the mobile device is configured to allow a user to choose locations for their specific device and related actions that are performed when the device is determined to be at such device-specific target locations. (Ex-1054, Abstract, FIGS. 1A-4, 1:38-2:6, 2:10-44, 3:4-67; *see also* my discussions above in §VIII.F.) Figure 2 (below) exemplifies a process for location reminder programming, monitoring and triggering procedures, executed on the mobile device that can have “position location technology.” (Ex-1054, FIG. 2, 3:49-55.)

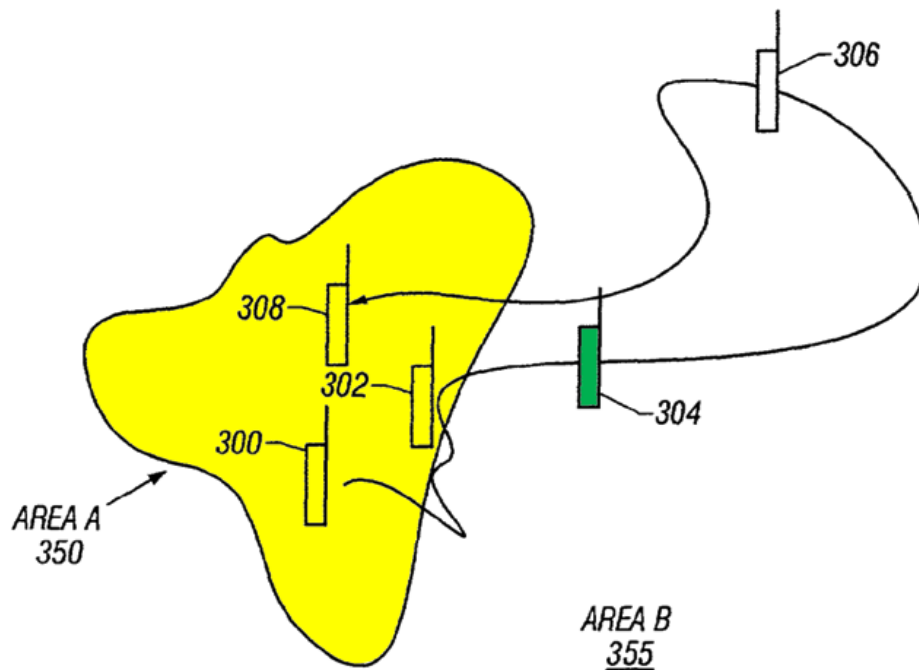


133. *Hunzinger* explains that location related information (“‘remembered’ locations”) and trigger or action information is stored in the mobile device, which also has position-monitoring functions that “compares one or more ‘remembered’ locations with current location information.” (*Id.*, 3:56-60.) The user may use a stored or current location, and the device can use location information such as “signal conditions...or other location identifying information” where it is “only necessary that information allow the terminal to *recognize whether or not it has left*

or returned to the same location.” (*Id.*, 4:1-12.) Location information can include a “set area [that] may be defined several ways: a point with a radius, network parameters, a geographic geometric shape, etc.” but “it is not necessary that the mobile [device] knows the exact location...as long as it can store and recognize it.” (*Id.*, 4:12-18.) “The *location area characteristics may be settable by the user* or be adapted according to the precision, accuracy or availability of location information.” (*Id.*, 4:18-20.)

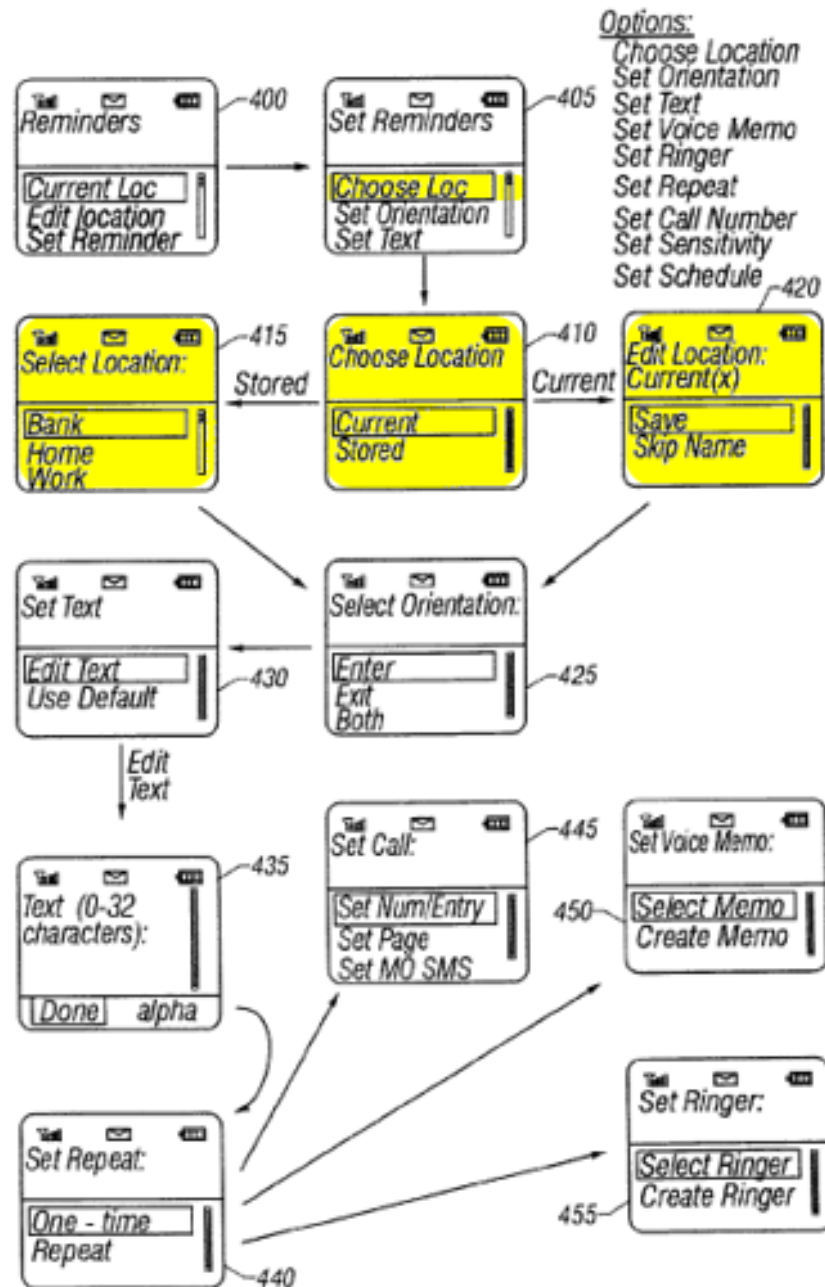
134. The mobile device “stores the location trigger and action information and a reference to the current location 220” so that it can monitor “the current location until it is outside of the ‘set’ location area.” (*Id.*, 4:21-24.) For instance, “the mobile may *detect it has transitioned out of the area* described by the stored location information *or that the current location matches* the stored location information 230....” (*Id.*, 4:24-31.) Thus, where the mobile device “exit[s] the location, it may not trigger the stored action but rather return[s] to continue monitoring...until the current location again matches or is similar to the stored location.” (*Id.*, 4:21-38, 4:44-46 (triggering stored action when detecting device has “reentered the vicinity of the stored-location, i.e., entering the location described by the stored location information”).) (*See also id.*, 4:51-5:22.) As an example, *Hunzinger* explains that the mobile terminal can trigger an action (*e.g.*, a reminder)

upon detecting that it “exited Area A 350” and “reached location 304.” (Ex-1054, 4:60-5:22, FIG. 3 (annotated below illustrating example when *Hunzinger* system/process detects that mobile phone exited area 350 (yellow) and reached location 304 (green)).)



135. Figure 4 (annotated below) allows user controlled options for programming location actions to be executed when a programmed reminder is triggered based on a corresponding location. (*Id.*, 5:22-40.) The device allows the user to easily choose device-specific target locations for its specific device and corresponding actions/reminders to be executed based on chosen location(s) for the

particular device and corresponding device-specific target locations. (Ex-1054, 5:22-40, 5:51-52 (“user may select the current location...”), FIG. 4 (below).)



136. As highlighted above, the “user may select the current location and provide a text name to be associated with it 420.” (*Id.*, FIG. 4, 5:51-52.) The “user may also select to be reminded only upon leaving an area or entering an area independently or exclusively.” (*Id.*, 5:53-61.) The reminder action can take many forms, including displaying a text message, voice memo play-back, call to a number, playing a ringer, download information/content, etc. (*Id.*, 5:62-6:7.) *Hunzinger* also discloses that location precision and accuracy can be improved “through multiple measurements or through refinement of the measurements” including “averaging multiple measurements or fixes [as] is *well known in the art.*” (*Id.*, 6:8-22.)

137. Accordingly, *Hunzinger* discloses device location determination technologies/techniques, and similar to *Spain-I*, is in the same technical field as the '811 patent. (*See* my discussions above in this section §IX.A.1(b); *see also* my above citations/discussions regarding *Hunzinger* and those above in §IX.A.1(pre)-1(b) regarding *Spain-I*; Ex-1001, Abstract, 1:23-10:25.) Also, a person of ordinary skill in the art would have understood that similar to *Spain-I*, *Hunzinger* discloses features that would have been pertinent to particular problem(s) that the '811 patent looked to address (and those a person of ordinary skill in the art was trying to address). (*See e.g.*, my citations and discussions above and those in §IX.A.1(b)(1); *see also e.g.*, Ex-1001, 1:23-10:25, 3:26-35, 5:14-37, 5:54-56; Ex-1011, 1:16-54,

3:18-40, 15:19-29; Ex-1054, 1:13-2:49, 3:44-4:59.) In my opinion, and as I noted above, a person of ordinary skill in the art would have consulted such teachings and suggestions when considering, designing, and implementing a location-determining process/system, like that described by *Spain-I*.

138. A person of ordinary skill in the art would have recognized and appreciated that *Hunzinger*'s teachings were consistent with technologies and techniques that were known to a person of ordinary skill in the art at the time. (See my discussions above in §V; *see also e.g.*, Ex-1016, Abstract, FIGS. 1:18-4:63, 6:30-7:3, 14:38-44 (discussing well known user defined geofence techniques/technologies), 16:41-67, 17:39-20:46; Ex-1019, ¶¶0008-0081, 0164-0171, 0177-0185, 0217-0240; Ex-1055, 1:49, 2:20-3:3, 3:49-4:22, 6:12-7:41 (user designated zones/tasks); Ex-1061, FIG. 13c, 1:61-2:8, 8:54-9:10, 21:4-13.) Consistent with such knowledge, and the teachings of *Hunzinger*, a person of ordinary skill in the art would have found *Nanda*'s teachings beneficial in considering ways to allow fingerprint data to be collected by a mobile device for use in a fingerprint database and ways to allow a user to choose device-specific target locations used in location-determining operations consistent with that of *Spain-I-Hunzinger*. A person of ordinary skill in the art would have been motivated to

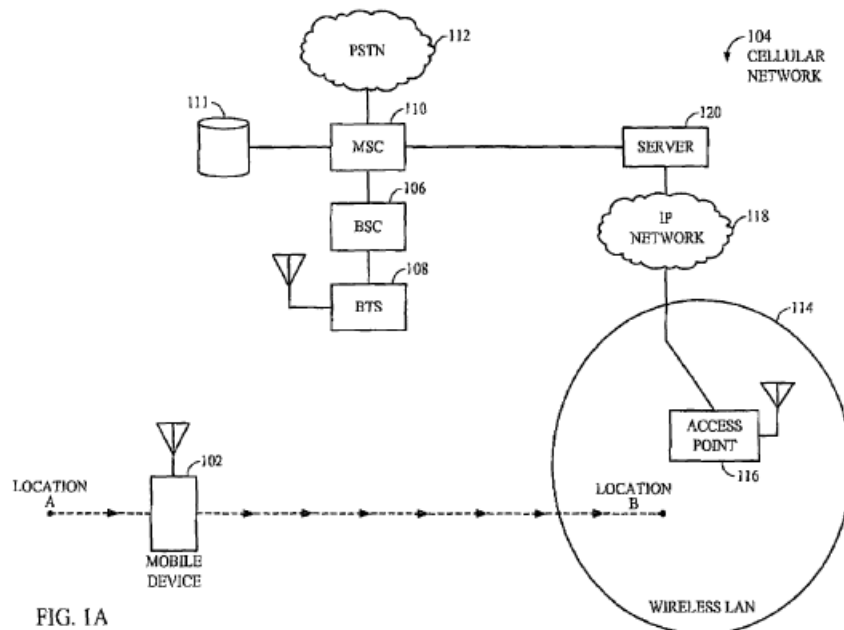
consider *Nanda* for the additional reasons I discuss below (*see* my analysis below in §IX.A.1(b)(2)-(4)).

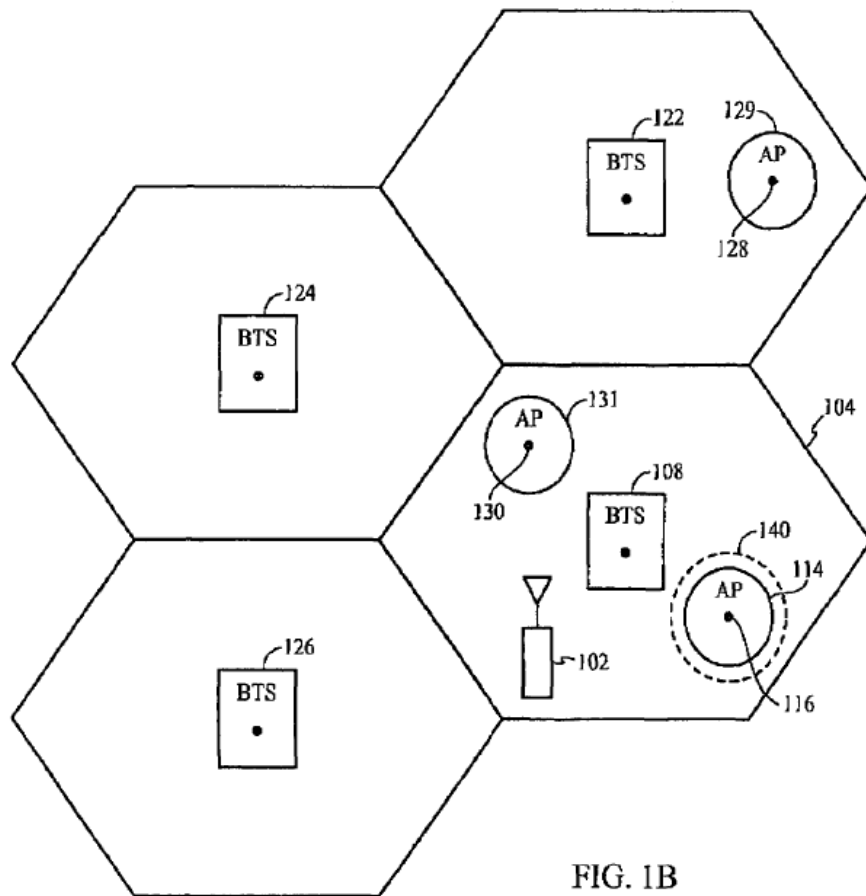
139. In my opinion, a person of ordinary skill in the art would have found *Nanda*'s teachings to further support, and were consistent with, such a person's rationale for considering various ways to configure the *Spain-I* system/process to facilitate the collection of fingerprint information in a manner consistent with the suggestions I discussed above. Therefore, in my opinion, *Nanda*'s teachings of similar technologies and techniques known to a person of ordinary skill in the art would have contributed to the motivation and reasons for configuring *Spain-I* as I explain here, including in light of the teachings of *Hunzinger*.

140. I discuss *Nanda* above in §VIII.B. In my opinion, similar to *Hunzinger*, *Nanda* discloses features in the same technical field and address problems similar to those of the '811 patent, and thus would have been consulted by a person of ordinary skill in the art for reasons above and those below (§§IX.A.1(b)(2)-(5)). It is my opinion that *Nanda* discloses device location determination technologies/techniques in the same technical field as the '811 patent, similar to *Hunzinger* and *Spain-I*. (*See* my discussions above in §§IX.A.1(pre)-(b) regarding *Spain-I* and *Hunzinger*; §VIII.A-B, VIII.F; Ex-1001, Abstract, 1:23-10:25.) Also, similar to *Spain-I* and *Hunzinger*, *Nanda* discloses features that were related to problem(s) the '811 patent

aimed to address and those a person of ordinary skill in the art were looking to address. (*E.g.*, Ex-1001, 1:23-10:25 (*see e.g.*, 3:26-35, 5:14-37, 5:54-56); Ex-1011, 1:16-54, 3:18-40, 15:19-29; Ex-1005, 1:19-36, 1:43-54, 2:25-39, 6:63-7:4; Ex-1006, 1:21-3:2, 6:12-7:27, 8:14-11:32, 12:14-31.) It is my opinion that such teachings in *Nanda* would have been consulted when designing/implementing a location-determining process/system, like that described in *Spain-I*

141. For example, *Nanda* discloses systems and processes that determine whether a mobile device is “in the vicinity of” a location by comparing fingerprint information. (Ex-1006, FIGS. 1A-1B (shown below), 2:16-59, 3:48-4:14, 5:50-7:28.)





142. *Nanda* also explains that device 102 can observe up to n base stations with measurable signal strengths (characterized as vectors $X_1, \dots, X_n$) originating from a particular identified base station. (*Id.*, 5:57-67, 5:67-6:3 (“neighbors base stations may be identified by frequency channel or other *base station identifier and a signal strength associated with each base station*”).) The vectors can include information that “identifies a source and at least one characteristic of the reference

signal, *e.g.*, pilot or paging signal.” (*Id.*, 6:3-11; *id.*, 6:12-34 (signal strength and base station identifier).)

143. Such information may be used to provide a fingerprint of a location of mobile device 102. (*Id.*, 6:52-58 (“[i]f locations within the area 140 have a certain known fingerprint, then the ***mobile device can determine its current fingerprint and compare it to the known fingerprint to determine whether the mobile device is located within the area 140.***”).) Other attributes, and combinations thereof, may be used as a fingerprint (*id.*, 6:58-66) given “a fingerprint is a collection of attributes of a first communication network that changes based on location and can be used by the mobile device to determine the proximity of a second communication network” and can include characteristics of the transmitters of the second networks (*e.g.*, MAC ID, band, channel, access point RSSI information (*e.g.*, signal strength)) (*id.*, 7:6-14). Such attributes may be calculated in different ways, such as instant signal strength measurements or multiple measurements may be averaged together or otherwise combined in some statically significant manner in order to generate the fingerprint. (*Id.*, 7:19-28.)

144. Further, *Nanda* describes processes where the mobile device 102 includes algorithms for creating multiple fingerprints for subsequent comparison for determining whether the device is at or near a particular device-specific target

location. *Nanda* explains “[f]or example, using the keypad 212, **a user of the mobile device 102 may select a key that causes the mobile device 102 to create a current fingerprint and store that fingerprint in memory 211.**” (Ex-1006, 8:29-36; *id.*, FIG. 2 (below).)

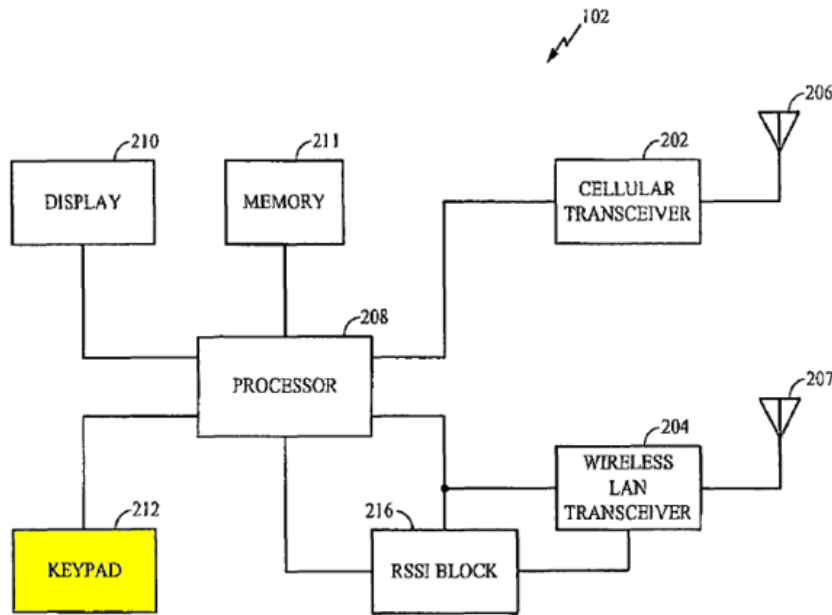


FIG. 2

In discussing Figure 3A, *Nanda* also states that “[o]nce the mobile device has connected with the access point, **the user may, in step 304, signal to the device to capture the current fingerprint**” and that “[t]his step may typically be **user-initiated because the user may want only certain** wireless LANs to be stored in the fingerprint database such as those wireless LANs that the user normally subscribes to or connects.” (Ex-1006, 9:61-10:7.) And like *Spain-I*, the fingerprint database

may be stored locally on the MU. (Ex-1006, 9:61-10:13, 12:14-31; Ex-1011, 5:60-6:14.)

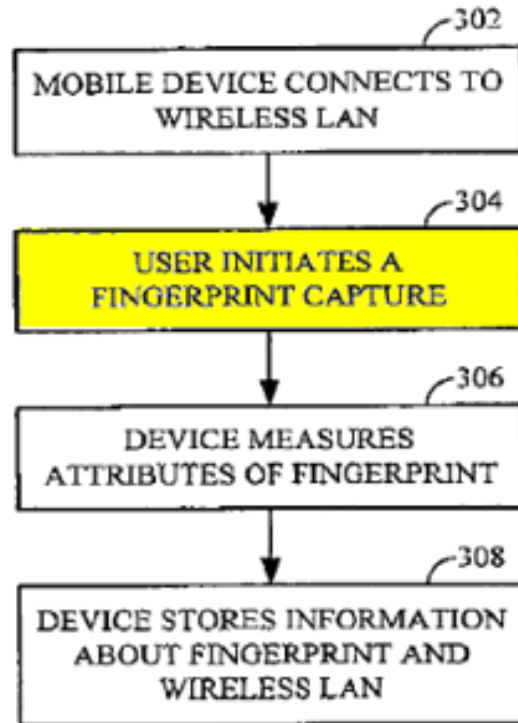


FIG. 3A

145. In addition, the signal strengths for such a device-specific target location fingerprint were determined at the very location designated as the device-specific target location. This is because the system measures received signal strengths when a user directs its device to capture a reference fingerprint there. This configuration also aligns with *Spain-I*, which includes disclosures regarding signal strength measurements when a fingerprint is generated for a reference fingerprint

and a fingerprint for a current/monitored location. (Ex-1006, 9:60-10:13; Ex-1011, 5:60-6:14, 4:55-57, 14:10-37, FIGS. 9-10; §§IX.A.1(a)-(b)(1).)

146. A person of ordinary skill in the art would have understood that *Nanda* describes features where a user of a mobile device can select when the device will create a device-specific location fingerprint while the device is at a target location chosen by the user and stores that information in memory. When that occurs, the mobile device measures/collects and generates fingerprint information at a location chosen by the user (*e.g.*, a user with the mobile device may be standing a location A when selecting to initiate measurements and fingerprint generation, and thus location A is a device-specific target location by the mobile device user). The generated and stored fingerprint information contains signal strengths associated with the signals received from the antenna base stations by the mobile device while the device is at a device-specific target location, which are compared with fingerprint information of the mobile device's current location to aid in determining whether the device is in the vicinity of such a previously selected/tracked location (*e.g.*, “am I there”—MU is at, entering, or has left a device-specific target location.) (*See* my below analysis in §§IX.A.1(b)(2).) *Nanda's* disclosures are consistent with those of

Hunzinger (Ex-1054) and the state of art knowledge at the time. (*See e.g.*, Ex-1054, 3:29-5:22 and Ex-1053, Abstract, FIG. 1, ¶¶0007-0008, 0013¹⁰)

147. A person of ordinary skill in the art would have thus appreciated how *Spain-I* teaches processes that determine if the MU “is at a particular location or not” (Ex-1011, 4:23-25; *id.*, 4:43-47, 5:54-6:8) and that *Nanda* also discloses location determining processes that determine whether a mobile device is “in the vicinity of” a location by comparing fingerprint information, which includes allowing a user to select location(s) where fingerprint-type information is collected/generated and stored (Ex-1006, 2:16-59, 5:50-7:28, 8:29-36, 9:65-10:7; *see* my discussions above in §§IX.A.1(b)(1)-(2)). Such teachings and suggestions (in addition to the other teachings and suggestions that I referenced and discussed above/below) would have led a person of ordinary skill in the art who was considering/designing/implementing the *Spain-I* system/processes for various applications to consider available ways and options to configure such a system to provide controls for designating areas/locations and triggering services/actions when the MU enters, is at, or leaves

¹⁰ Consistent with other references I may refer to outside the prior art I identify for discussed combinations, I refer to *Bar-On* (Ex-1053) to demonstrate state of art knowledge of a person of ordinary skill in the art at the time.

a designated area/location. (*See* my discussions above in §V.) In view of such teachings and suggestions of *Nanda* and *Hunzinger*, and knowledge in the art, in context of *Spain-I*, it is my opinion that a person of ordinary skill in the art would have been motivated to configure *Spain-I*'s system/processes such that the MU includes mechanisms and associated functionalities/features (consistent/similar to that described by *Hunzinger* and *Nanda*) that would have allowed the MU user to choose device-specific target location(s) from which fingerprint information is collected/measured/generated and stored to build the fingerprint database information on the MU.

148. For instance, such a skilled person would have recognized *Spain-I*'s suggestions of providing configurations that allow a user to select locations (even in context of its FIG. 3 embodiment) and found *Hunzinger*'s and *Nanda*'s teachings relevant and persuasive in considering ways for the system/process to select locations from which such fingerprint information was collected for subsequent use as references against the current monitored location fingerprint information, as I discussed above. For example, as I noted, *Spain-I* discloses features where the user of MU can generate a request for the position of the MU (*e.g.*, whether or not it is at (or near) the same location corresponding to a previously generated fingerprint in the fingerprint database). (*See* my above analysis in §§IX.A.1(pre)-1(b); Ex-1011,

5:61-6:30 (describing in connection with FIG. 3 configurations that the “request [for position of the mobile unit] may be generated by the user carrying the mobile unit” and upon receipt of such request, the mobile unit captures the fingerprint of its “current location”); Ex-1005, 4:43-47 (“When a location estimate of the mobile unit is desired (either by the mobile unit itself or by the location server), it activates component 101 (FIG. 2), which captures predetermined from a predetermined portion of the RF spectrum.”).) Such disclosures would have suggested to a person of ordinary skill in the art user selectable location features, and would have led such a person to consider teachings in the art (like *Hunzinger* and *Nanda*) relating to similar features.

149. Thus, *Spain-I*, *Hunzinger*, and *Nanda* describe features that would have led such a skilled person to consider providing user-selectable location functionalities that facilitated the determination as to whether an MU was within proximity of a device-specific target location like that recited in limitation 1(b). Such a skilled person would have been motivated for considering and implement such device-specific target location features especially given *Hunzinger*’s additional details and options for providing user selectable location features, which described mechanisms for providing user-friendly interface capabilities on a mobile device, such as a menu-driven interface that enabled a user to select locations to be attributed

to particular actions to be performed upon determination the mobile device is at, entering, or has left such a user-selected location (including those defined by a radius or geofence-type location(s)). (Ex-1054, FIGS. 1A-4, 1:38-2:44, 3:4-67, 4:1-5:22.)

150. A person of ordinary skill in the art would have appreciated that *Hunzinger's* teachings were consistent with location determining technologies/techniques known to such a skilled person at the time, including those relating to geofencing and other user controlled configurations where specific/designated actions may be performed based on a location determined to be within or outside designated locations. (See my discussions above in §V; see also Ex-1016, Abstract, FIGS. 1:18-4:63, 6:30-7:3, 14:38-44 (user may define a geofence via portable device), 16:41-67, 17:39-20:46; Ex-1019, ¶¶0008-0081, 0164-0171, 0177-0185, 0217-0240; Ex-1055, 1:49, 2:20-3:3, 3:49-4:22, 6:12-7:41 (user designated zones where tasks are performed when it is determined mobile device is moved outside or inside zone); Ex-1061, FIG. 13c, 1:61-2:8, 8:54-9:10, 21:4-13.)

151. In my opinion, such functionalities and features (coupled with the teachings of *Nanda*) would have been in the mind of a person of ordinary skill in the art when considering *Spain-I* (see my discussions of *Spain-Nanda* for claim 1 in §IX.A.1). Such a skilled person would have found benefits in configuring the modified *Spain-I-Hunzinger-Nanda* system/processes such that the MU was

programmed/configured with similar user interface capabilities and associated location-based features to allow the MU user to choose the location(s) (used in the fingerprint database (that is specific to the MU)) and associate service(s)/actions/tasks, etc. with such location(s), which are performed by the MU upon determining when the current location fingerprint information (e.g., station ID/signal strengths) matches or otherwise.

152. Given the teachings and suggestions of *Hunzinger*, a person of ordinary skill in the art would have appreciated the advantages/benefits of programming/configuring the modified *Spain-I* system/processes to perform location determining processes such that determining whether the MU's current location is within proximity of the device-specific target location included determining whether the MU/user is at, has entered, or has left a device-specific target location and executing user selected actions based on such determination, consistent with that taught by *Hunzinger*. (See my above analysis regarding *Hunzinger*.) For example, such a skilled person would have appreciated potential advantages obtained from such modifications, such as expanding the applications of the modified *Spain-I*- system/processes so that particular (and user selected) actions can be triggered depending on how the user decides to configure such location-based functionalities using a user friendly interface on the MU (e.g., launching programs,

receiving alerts, reminders, etc. based on a determination that the MU/user is at or has entered a user specified location, or has left such a location). *Hunzinger's* guidance as to the benefits of such applications (e.g., Ex-1054, 2:10-44, 5:29-6:30) were consistent with such a skilled person's understanding of similar features in the art at the time, such as position tracking, security, communication or information management, service-related and other features, etc. (See my discussions above in §V; see also e.g., Ex-1016, 14:16-16:8; Ex-1055, 2:29-3:3, 7:8-41; Ex-1061, 1:53-2:52, 17:1-20:4; Ex-1019, ¶¶0164-0171.) A person of ordinary skill in the art would have understood that such features would have complemented the service-oriented features contemplated by *Spain-I*, which also would have motivated such a skilled person to consider the teachings and suggestions of *Hunzinger* (and *Nanda*). (Ex-1011, 3:5-16.)

153. For example, *Spain-I* discloses:

The location of the mobile unit is of interest to the location server for several reasons such as provisioning of prompt and efficient personalized services, dispatching emergency assistance personnel, tracking the movements of the mobile unit, etc.

(Ex-1011, 3:8-16.) Also that:

In many instances, *location server 30 is interested in only determining if mobile unit 10 is at a particular location or not*. The resolution of knowing the mobile unit's location is not high (e.g., several meters), but much coarser, such as of the order of several tens of meters. For example, *location server 30 may be interested in knowing if mobile unit 10 is inside a particular building, or a campus or a block*. In such cases it is not necessary to provide very high-resolution information to location server 30.

(*Id.*, 4:23-33.) Accordingly, such a skilled person also would have been aware of similar features in location determining system applications, as suggested by *Spain-I* and known in the art (Ex-1033, 1:43-59, 5:46-6:38; Ex-1016, 1:18-4:63, 6:30-7:3, 16:41-67.)

154. A person of ordinary skill in the art would have thus appreciated benefits in allowing the user to select locations that he/she desires to be checked/tracked (e.g., allow the MU user to select locations that may be of interest to them so that later the MU can inform the user or perform certain functions when the MU/user is later determined to be within the vicinity of the chosen location (e.g., particular retailer, service vendor, home, office, etc.)). Such action-based features/functionalities, coupled with the use of interface mechanisms to facilitate

user chosen location functionalities (as I discussed above), would have beneficially expanded the capabilities/functionalities of the *Spain-I* system/process with improved features, resulting in a more marketable, desirable, and/or user-friendly and feature-based location determining system, thus expanding the application options considered by a person of ordinary skill in the art designing/implementing *Spain-I*'s system/process, consistent with *Hunzinger* (e.g., Ex-1054, 2:10-44, 5:29-6:30), *Nanda* (see my discussions above), such a person's state of art knowledge (see my discussions above in §V; see also e.g., Ex-1016, 14:16-16:8; Ex-1055, 2:29-3:3, 7:8-41; Ex-1061, 1:53-2:52, 17:1-20:4; Ex-1019, ¶¶0164-0171), and features contemplated by *Spain-I* (Ex-1011, 3:5-16).

155. A person of ordinary skill in the art would have considered known tradeoffs, such as balancing costs, processing and other computing resources, beneficial features and expanded applications provided, and the like, in considering the modification. Consequently, in my opinion, in light of such collective teachings/suggestions from *Spain-I*, *Hunzinger*, and *Nanda* in context of a person of ordinary skill in the art's state of art knowledge, a person of ordinary skill in the art would have been motivated to configure the modified *Spain-I* system/processes where the MU performed processes to cause a determination if a monitored location is within proximity of a device-specific target location of the MU (e.g., MU/user

monitored location is at, has entered, or left a user chosen location for the specific device), like that claimed. A person of ordinary skill in the art would have leveraged their skills and knowledge to configure the resulting system/processes to include, among other things, modified software and possibly related components in the MU that worked in conjunction with the signals communicated from the antenna stations in a manner consistent with the *Spain-I-Hunzinger-Nanda* system/processes that I discussed above and features similar to those described by *Hunzinger* and *Nanda* (modified to be compatible and operational in the *Spain-I* modified MU system/processes). (Ex-1054, 4:1-5:22; Ex-1011, 4:23-26; Ex-1006, 2:16-59.)

156. A person of ordinary skill in the art would have thus understood that such modifications would have involved use of known technologies and techniques within their knowledge and capabilities. Thus, such a skilled person thus would have been capable of considering, designing, and configuring such modifications, and done so with a reasonable expectation of success in achieving them. In fact, *Hunzinger* discusses use of station ID and signal conditions (including signal strength) for location information for determining whether a device has returned to a previously identified location (Ex-1054, 4:1-20, 6:37-49, 7:9-22, 7:29-42, 8:25-38 (see my discussions below in §IX.A.1(b)(2))) similar to *Spain-I*'s configurations that allowed a user to select when (and thus where) MU location determination is to

be initiated (*e.g.*, Ex-1011, 6:9-21) and use of station ID and associated signal characteristic information (*id.*, 13:16-14:31), and the state of art (Ex-1062, 1:26-33 (“The mobile station’s position is determined to lie in the area corresponding to a fingerprint data point of highest correlation to the RF data sample.”); Ex-1028, 12:55-13:18 (discussing fingerprint location techniques to determine whether a user has entered or exited a given area)). (*See also* Ex-1011, 3:34-40, 15:19-35.)

157. Thus, it is my opinion that the collective teachings/suggestions of *Spain-I-Nanda-Hunzinger* and a person of ordinary skill in the art’s state of art knowledge, would have motivated such a skilled person to configure/modify the *Spain-I* system/processes with beneficial features like those discussed above (*e.g.*, MU interface mechanisms/functionalities allowing a user to choose device-specific target location(s) from which fingerprint data is collected for building the device-specific target locations in the database, and configurations that perform user selected actions to be executed/performed depending on user-selected proximity trigger conditions (at, entering, left location(s), etc.)).

158. Accordingly, the *Spain-I-Hunzinger-Nanda* combination (including as complemented by the teachings of *Nanda* for reasons mentioned below in §IX.A.1(b)(2)) discloses/suggests the “causing a determination of whether the portable RF communications device is within proximity of the device-specific target

location” (MU) features of limitation 1(b), including where such proximity features encompasses the monitored location being at the device-specific target location, and where they include determining that the MU/user has entered or left such location, consistent with that discussed in the specification and/or the prosecution file history of the '698 parent patent (as I discussed above (*e.g.*, “am I there”)). The modified *Spain-I-Hunzinger-Nanda* system/processes further would have included the MU automatically performing above features corresponding to limitation 1(b) for reasons similar to those discussed above (§IX.A.1(pre)-A.1(a)) and below (§IX.A.1(b)(5)).

159. I have also been asked to assume a scenario wherein the claimed determining whether the portable RF communications device is within proximity of the device-specific target location features of limitation 1(b) encompasses such features. As to that scenario, it is my opinion that the combination discloses/suggests the claimed device-specific target location in context of such intrinsic disclosures, including where it is encompasses chosen/selected target locations.¹¹

¹¹ I have also been asked to assume a scenario wherein *Spain-I* discloses such features (thus meets the limitation). As to that scenario, the reasons for modifying *Spain-I* remain for reasons below. (§§IX.A.1(b)(2)-(5).)

**(2) Comparing Signal Strengths Number(s)
Features and Identifying in Range
Stations/Signals**

160. In my opinion, the *Spain-I-Hunzinger-Nanda* combination discloses and/or suggests the comparison features recited in limitations 1(b).

161. As I addressed above, the plain language of “at least one *number* based on signal strengths” as recited in claim 1 includes signal strength measurement(s), which is a number (*e.g.*, value), consistent with that described in the ’811 patent (Ex-1001, 6:43-47 (“the majority of the description relates to direct measurements of signal strengths and direct comparisons of those measurements”), 7:9-13 (“device simply performs such reception measurements and compares these measurements with the remembered signal strength combinations”)), and consistent with the representation that the claimed “number(s) based on” encompass “direct” signal strength measurements. (§§VII-VIII; Ex-1004, 41-43) and known in the art.

162. In accordance with industry practices and as seen in the ’811 patent, *Spain-I* provides a description of measuring signal strengths using strength values, which are essentially numerical representations, or “number(s),” derived from signals received from antenna stations when the Mobile Unit (MU) is positioned at the target locations, similar to what is claimed. (§§IX.A.1(pre)-IX.A.1(a); Ex-1011, 12:11-14 (“-11 dBm”), FIG. 9 (SS values).) Consequently, the signal strength values

(such as a SS value) in each fingerprint (for the current monitored location and for the location(s) in the fingerprint database) includes “at least one number” based on signal strengths from each of multiple communication signals. (*See* my above analysis §IX.A.1(a)-1(b)(1).)

163. In *Spain-I*, when it tracks the currently received fingerprint along with the associated signal strength data (as discussed in §IX.A.1(a)), the measurements of the current signal strengths for the received signals include “at least one number” based on signal strengths of each of the first plurality of communication signals like that claimed. (§IX.A.1(a); Ex-1011, 12:11-14 (“-11 dBm”), FIGS. 9-10.)

164. Fingerprint data that was previously stored, along with its corresponding signal strength information, is maintained in a database situated on the Mobile Unit (MU). (Ex-1011, 5:60-6:14 (“a fingerprint database that contains a number of fingerprints....the database is stored in the mobile unit”), 4:55-57 (fingerprint may be generated using signal strength), 14:10-31, FIGS. 9-10; §IX.A.1(a).) Hence, when *Spain-I* generates a fingerprint along with corresponding signal strength information for the purpose of constructing the database, the signal strength measurements for the received signals encompass “at least one number” based on signal strengths of each of the second plurality of communication signals

received from second antenna stations similar to that like that claimed. (*See my above analysis.*)

165. *Spain-I* also explains the process of creating a fingerprint, which includes a stored or reference fingerprint for a device specific target location within the database, in which signal strengths are “lower and upper limited to eliminate very weak and very strong signals.” (Ex-1011, 5:54-60, 4:55-57, 5:60-6:14, 14:10-37, FIGS. 9-10.) By eliminating such very weak signals and corresponding antenna station IDs from a fingerprint, in one example, a process/system is configured to identify if a second plurality of antenna stations and corresponding signal strengths of a stored/reference fingerprint are within range of the location that the fingerprint is taken. (Ex-1011, 5:54-60, 4:55-57, 5:60-6:14, 14:10-37, FIGS. 9-10; §IX.A.1(b)(1).) These procedures detailed in *Spain-I* would have been an integral component of the fingerprint generation process, even when the user indicated a device-specific target location, as previously mentioned. (§IX.A.1(b)(1).)

166. *Spain-I* describes the action of comparing the “generated fingerprint” with the “fingerprints in the database” and determining the Mobile Unit (MU) location as the one that corresponds to the closest matching fingerprint found in the database. (Ex-1011, 5:66-6:14, 4:55-63 (fingerprints based on station ID/signal strength); Ex-1005, 4:22-36.) As explained by *Spain-I*, “[t]here are many

choices...to determine the closest matching fingerprint, as can be appreciated by one skilled in the art,” including “smallest mathematical distance between itself and the captured fingerprint.” (Ex-1011, 8:8-21; Ex-1005, 5:10-33.)

167. In addition to my above discussions, *Spain-I* discloses various ways to determine whether fingerprint information matches or is “close” to each other. *Spain-I* explains:

The generated fingerprint is compared with the fingerprints in the database and the fingerprint in the database that is closest to the generated fingerprint is selected as the match. *The corresponding location in the database is then chosen as the location of the MU.* In one embodiment of the invention, the search algorithm takes more than one fingerprint from the database that are closest to the generated fingerprint and interpolates the most plausible location for the MU from the locations of the chosen fingerprint. (Ex-1011, 5:66-6:8; Ex-1005, 4:22-36.)

“There are many choices for the search algorithm that is required to determine the closest matching fingerprint, as can be appreciated by one skilled in the art of statistical pattern matching,” including choosing “the fingerprint from the database that has the smallest mathematical distance between itself and the captured fingerprint”

(e.g., “norm between the two data sets” and “***average squared difference between the two fingerprints***”). (Ex-1011, 8:8-21; Ex-1005, 5:10-33).

168. Although *Spain-I* discloses various fingerprint comparison features, *Spain-I* lacks details as to how the fingerprint data is assessed or how such comparisons are performed, including in context of the fingerprints’ underlying parameters, such as comparing received and device-specific target location signal strength number(s). However, a person of ordinary skill in the art would have appreciated at the time that there were a variety of ways for analyzing fingerprints and signal characteristics to determine location proximity (as *Spain-I* suggests). Therefore, such a skilled person would have been motivated to consider teachings in the art when considering *Spain-I* (including in context of the modifications I discussed above relating to *Hunzinger* and *Nanda*). (See my discussions above in §IX.A.1(b)(1) and in §V; see also e.g., Ex-1019, Abstract, ¶¶0012-0078, 0176-0177, 0333; Ex-1020, Abstract, ¶¶0013, 0029, 0048-0059; Ex-1017, Abstract, 3:64-4:7, 6:23-8:38; Ex-1026, Abstract, 3:58-4:56; Ex-1027, Abstract, ¶¶0012-0023, 0096-0099; Ex-1028, Abstract, FIGS. 4-8, 1:10-4:14, 5:10-16, 5:16-63.) Accordingly, such a skilled person, would have been motivated by the collective teachings of *Hunzinger-Nanda* to configure the MU in the modified *Spain-I* system/process to

determine if the MU's current location is in proximity of a device-specific target location (§IX.A.1(b)(1)) by electronically comparing at least one number based on signal strengths of each of the first plurality of communications signals with at least one number based on corresponding signal strengths of each of a second plurality of communication signals from a second plurality of antenna stations that have been identified as being within range of the same location as the device-specific target location, which signal strengths have been determined for the same location as the device-specific target location as claimed in limitation 1(b).

169. For example, as I discussed above, *Hunzinger* discloses features where a mobile device includes position location technology and memory to store remembered location information, monitors the mobile device's current location, and compares remembered locations with current location information to determine whether the device has left or entered a remembered location to execute particular actions..

FIG. 2 is a flow chart illustrating location reminder programming, monitoring and triggering procedures according to one embodiment of the present invention.

The procedure is executed on a mobile terminal with or without position location technology. The mobile terminal has some type of user-interface that is capable of allowing selecting or programming reminders alerts, or

actions. The mobile terminal also includes memory for storing location related information (“remembered” locations) and trigger or action information. ***The terminal also includes a position-monitoring function that compares one or more “remembered” locations with current location information.***

(Ex-1054, 3:49-60; *see also id.*, 4:21-57.) *Hunzinger* explains that **location information** can include “station ID” and “signal conditions” (*id.*, 4:3-8). In particular, location information can include base station IDs and signal strength data, which are compared to determine whether the mobile device is at, entered, or left a remembered location. *Hunzinger* discusses location information in its claims:

1. A method of providing a terminal with location-based actions in a communications network comprising:

storing at least a ***first set of location information;***

associating a terminal action with said first set of location information; and

executing the associated terminal action when a ***current terminal location information is within a specified range of the first set of location information;***

applying to a ***comparison between the current terminal location information and the first set of location***

information a step selected from the group consisting of hysteresis, delay, proximity threshold, distance threshold, signal condition change threshold.

8. The method of claim 1, wherein **said location information consists of at least one** of the elements selected from the group consisting of **base station identifier, pilot signal strength**, pilot signal pseudo noise offset, multi-path profile, signal conditions, location identification, location name and area name.

(*Id.*, 6:37-49, 7:9-22.) (See also *id.*, 7:29-42, 8:25-38.)

170. *Hunzinger* also describes with reference to FIG. 3 (below) an exemplary monitoring/triggering action where the device “monitors the current location information *compared* to the stored reminder *location information*,” and the compared location information may include base station ID and pilot signal strength information. (*Id.*, 4:60-5:22 (describing reminder triggered when device is at location 300; transitions based on base station ID, pilot, etc.), 4:1-12, 6:37-49, 7:9-22, 7:29-42, 8:25-38.)

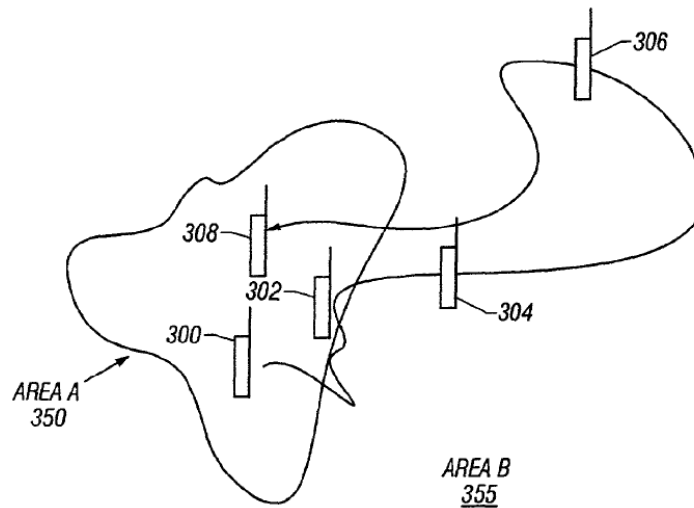


FIG. 3

171. A person of ordinary skill in the art would have appreciated and understood that *Hunzinger's* teachings were consistent with technologies and techniques known to such a person at the time. (See my discussions above in §IX.A.1(b)(1) and in §V; see also e.g., Ex-1019, Abstract, ¶¶0012-0078, 0176-0177, 0333; Ex-1020, Abstract, ¶¶0013, 0029, 0048-0059; Ex-1017, Abstract, 3:64-4:7, 6:23-8:38; Ex-1026, Abstract, 3:58-4:56; Ex-1027, Abstract, ¶¶0012-0023, 0096-0099; Ex-1028, Abstract, FIGS. 4-8, 1:10-4:14, 5:10-16, 5:16-63.)

172. For example, in consulting *Nanda* for reasons above (§IX.A.1(b)(1)) a person of ordinary skill in the art would have discovered teachings of comparing signal strength data for current and stored fingerprints when determining if a device is in proximity of a location. (§IX.A.1(b)(1); Ex-1006, FIGS. 3A-3B, 2:43-51, 6:12-

66, 7:6-13, 8:29-55.) For example, *Nanda* discloses collecting signal information to generate fingerprints associated with specified locations, which are stored and used to be compared with a current location fingerprint to determine whether the mobile device is located within the proximity of a device-specific target location associated with a matching fingerprint. (See my above discussions regarding *Nanda*, including those in §VIII.B; Ex-1006, FIGS. 3A-3B, 2:43-51, 6:12-66, 7:6-13.) *Nanda* describes configurations where a mobile device 102 executes an algorithm for creating fingerprints and “comparing different fingerprints to one another” and that a fingerprint may be associated with connected wireless LAN access point(s). (Ex-1006, 8:29-55.) Such processes results in stored information—exemplified in the table below—including signal strengths.

WAN ID	WLAN SSID	WLAN BSS ID	Signal Strength	Phase
A	I1	A ₁	$s_1(A_1) \dots s_n(A_1)$	$p_1(A_1) \dots p_n(A_1)$
		A ₂	$s_1(A_2) \dots s_n(A_2)$	$p_1(A_2) \dots p_n(A_2)$
		A ₃	$s_1(A_3) \dots s_n(A_3)$	$p_1(A_3) \dots p_n(A_3)$
B	I1	B ₁	$S_1(B_1) \dots s_n(B_1)$	
	I2	B ₂	$S_1(B_2) \dots s_n(B_2)$	

(*Id.*, 8:29-55, 9:31-10:13, 8:56-9:13.)

173. *Nanda* explains that the last two columns of the above table “include the values that comprise the fingerprint itself,” where “the fingerprints for the access

points B_1 and B_2 comprise only signal strength information.” (Ex-1006, 9:8-13.)

The mobile device may “calculate a fingerprint for its current location and compare it to the information in columns 4 and 5 in the table,” and may limit its fingerprint match to entries corresponding to the WAN ID with which its registered (*e.g.*, “when registered with WAN ID A [or B], only fingerprints associated with WAN ID A [or B] in the table are used for matching”). (*Id.*, 9:17-20.) “[C]omparison of a current fingerprint to a stored fingerprint can be performed in a variety of ways.” (*Id.*, 10:14-16.) Because fingerprints have attributes that may vary (even for the same location), *Nanda* describes a comparison process that does not rely on “exact duplicity” for a match. (*Id.*, 10:22-25.) Thus, *Nanda* defines a “deviation amount” to “help control the determination of whether a finger matches a stored fingerprint” (*id.*, 10:36-38), which is shown in the table below as “d” for signal strength deviation.

WAN ID	WLAN BSS ID	Signal Strength	Strength Deviation	Phase	Phase Deviation
A	A_1	$s_1(A_1) \dots s_n(A_1)$	$d_1(A_1) \dots d_n(A_1)$	$p_1(A_1) \dots p_n(A_1)$	$q_1(A_1) \dots q_n(A_1)$
	A_2	$s_1(A_2) \dots s_n(A_2)$	$d_1(A_2) \dots d_n(A_2)$	$p_1(A_2) \dots p_n(A_2)$	$q_1(A_2) \dots q_n(A_2)$
	A_3	$s_1(A_3) \dots s_n(A_3)$	$d_1(A_3) \dots d_n(A_3)$	$p_1(A_3) \dots p_n(A_3)$	$q_1(A_3) \dots q_n(A_3)$

(*Id.*, 10:39-51.) The above table shows identified antenna stations (*e.g.*, A_1 , A_2 , A_3) respectively associated with signal strength number(s) (*e.g.*, $S_1\{A_1\} \dots S_n\{A_1\}$) and deviations (*e.g.*, $(d_1\{A_1 \dots d_n\{A_1\})$).

174. Regarding FIG. 3B (“method to compare fingerprints of different locations”) (Ex-1006, 3:18-19), when the MU is controlled to capture a current location fingerprint, a signal strength vector is collected (“ $X_i \dots X_n$ ”). (*Id.*, 10:51-56, FIG. 3B (320) (below).)

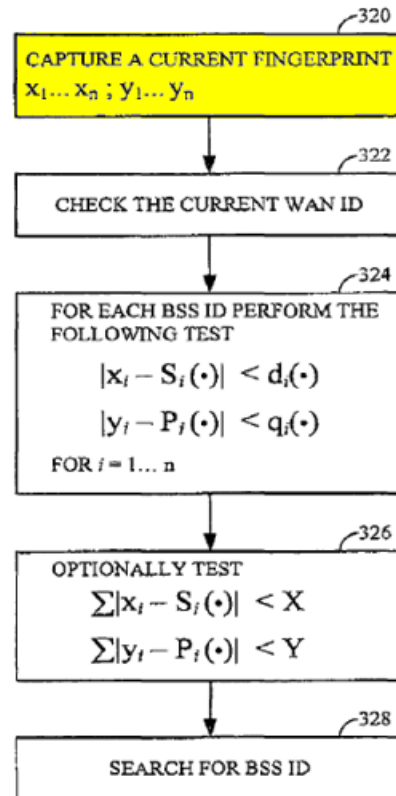
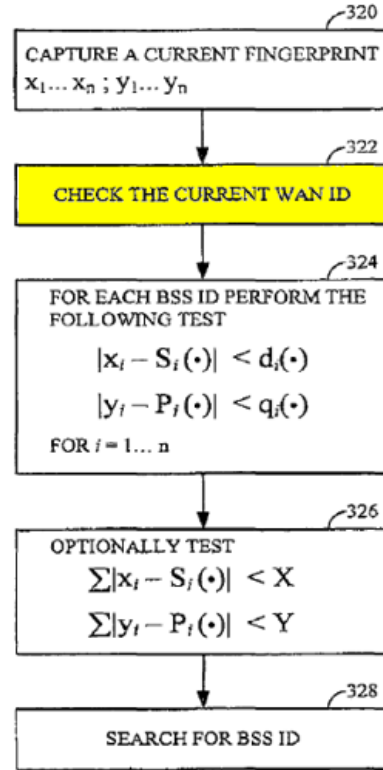


FIG. 3B

175. At step 322, the current WAN ID is checked and identified access point information is determined for the current location (*Id.*, 10:58-60; *id.*, 9:31-38 (discussing information stored in the table of column 8 may vary, including the “combinations of WAN IDs versus access point IDs”), *id.*, 9:38-52 (“... store

information about the corresponding access point (*i.e.*, the BSS ID”), 10:60-61 (“searching database for identifiers of the observable pilots [signals]”).)



176. At step 324, the signal strength(s) of fingerprint(s) for each BSS ID (access point) within an identified WAN ID (*e.g.*, A or B) are compared to the current fingerprint strengths to determine if the difference is below a predetermined threshold.

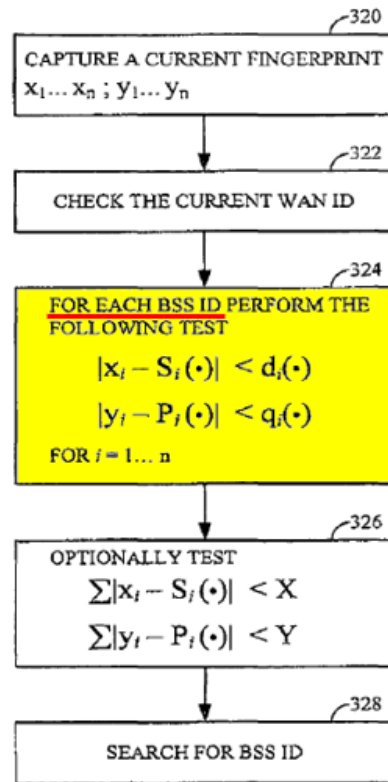


FIG. 3B

Algorithmically, the process may be performed by:

For $i = 1$ to n :
 determine if $|x_i - s_i(\cdot)| < d_i(\cdot)$
 determine if $|y_i - p_i(\cdot)| < q_i(\cdot)$

where d = deviation value (e.g., a threshold), x_i = signal strength of current signal i , and s_i = stored signal strength. (Ex-1006, 10:62-11:10.) A “match” is determined when the difference between a stored and current measured signal strengths ($x-s$) is less than ($<$) a predetermined threshold (d). (*Id.*) Nanda’s comparisons performed for the WAN IDs (322) and “each BSS ID” (324) indicates a comparison of antenna

station IDs since the stored number(s) (“Si”) and current number(s) (“Xi”) are compared for the same BSS ID and associated WAN ID, and thus a person of ordinary skill in the art would have understood *Nanda* to disclose or suggest comparing station identifier information to ensure relevant strength value information are compared (*e.g.*, number(s) corresponding to the same access points and/or WAN base stations (FIG. 3B, Steps 322-324). *Nanda* states that in step 322 “[f]urther search refinements are possible by **searching the database for identifiers of the observable pilots.**” (Ex-1006, 10:60-61.) That is, before the signal strength comparison takes place in step 324, the system compares monitored base station identifiers to identifiers stored in the database. (*Id.*) Moreover, in describing how the fingerprint entries can be refined, *Nanda* discloses how the BSS ID of a received communication signal at a current monitored location is checked against the BSS IDs in the fingerprint database. (Ex-1006, 11:33-41.) If no entry exists for that BSS ID (antenna station), “a current fingerprint can be generated (see FIG. 3A) and then stored.” (*Id.*, 11:42-43.) If a fingerprint entry exists for the access point, then the current fingerprint may be used to refine the stored fingerprint. (*Id.*, 11:43-46.) Refinement can include be made “with reference to the signal strength parameter, ... or any other attributed that used to create the fingerprint.” (*Id.*, 11:47-56; *see id.*, 11:56-12:13 (strength/deviation values adjusted).

177. Considering the teachings and suggestions of *Hunzinger* and *Nanda*, in context of their state-of-art knowledge and *Spain-I*, a person of ordinary skill in the art would have been motivated to configure the modified *Spain-I* system/processes described above (§IX.A.1(b)(1)) such that the MU's location determination includes comparing at least one number based on the signal strengths (such as SS value(s)) for a current/monitored location with at least one number based on the signal strengths (for instance SS value(s)) of stations for the device-specific target locations in the fingerprint database that is stored on the MU and that are identified as being in range. In this configured setup, signal strengths of the received fingerprint for a current location would have been determined for the same location as the device-specific target location associated with the matching signal strength fingerprint in the database that is stored on the MU. (Ex-1006, 9:60-10:13; Ex-1011, 5:60-6:14, 4:55-57, 14:10-37, FIGS. 9-10; Ex-1054, 4:1-5:22; §§IX.A.1(a)-(b)(1).) This configuration is consistent with the comparison teachings of *Spain-I-Hunzinger-Nanda* as I discussed previously.

178. A person of ordinary skill in the art would have recognized *Spain-I*'s teachings and suggestions (as detailed above in §§IX.A.1(pre)-1(b)(2)) within the context of the processes and features disclosed by *Hunzinger* (involving the comparison of current location signal strength information with remembered

location signal strength information) and *Nanda* (which describes processes that compares signal strength number(s) for a current location (*e.g.*, $x_1 \dots x_n$) with signal strength number(s) for previous selected locations (*e.g.*, $s_1 \dots s_n$) for each BSS ID and/or corresponding WAN ID). Guided by such teachings/suggestions, a person of ordinary skill in the art would have been led to modify *Spain-I*'s system/processes (*e.g.*, the MU) to perform processes that electronically compares at least one number based on signal strengths (*e.g.*, SS values) of each of the first signals from the first antenna stations with at least one number based on corresponding signal strengths (SS values) of each of a second plurality of signals from a second plurality of antenna stations (which would have been identified as being within range of the same location as the device-specific target location (as I discussed above)), consistent with the teachings and suggestions of *Nanda* and *Hunzinger*, and *Spain-I*. And as discussed above, consistent with the location determining operations disclosed by *Spain-I-Hunzinger-Nanda*, the comparisons would have resulted in a match (or close match), thus the signal strengths have been determined for the same location as the device-specific target location. Accordingly, such a skilled person would have appreciated implementing such features would have used relevant signal characteristics (signal strengths) for signals received from antenna stations that have been identified as being in range with the MU (including when obtaining the signal

information from the second signals and second stations) for determining whether an MU's monitored location is within proximity of a device-specific target location, and would have promoted increased accuracy and resource conservation, consistent with features disclosed/suggested by *Spain-I*, *Hunzinger*, and *Nanda*. (Ex-1006, FIG. 3B, 8:43-30, 10:49-11:19; §§IX.A.1(pre)-IX.A.1(b)(1); Ex-1054, 3:49-60, 4:3-5:22, 6:37-49, 7:9-22.)

179. For example, given the insights, disclosures, and guidance provided by *Hunzinger* and *Nanda* (alongside a person of ordinary skill in the art's general knowledge in the relevant art) in context of *Spain-I*, a person of ordinary skill in the art would have appreciated the advantages and benefits of comparing monitored/device-specific target location number(s) based on signal strengths when performing a determination of whether a location of the mobile unit (MU) (§IX.A.1(a)) is proximate to a device-specific target location (§IX.A.1(b)(1)). Such a configuration would have allowed appropriate actions to be performed by the *Spain-I* modified system in view of *Hunzinger* and *Nanda* as I explained above. (§IX.A.1(b)(1); Ex-1006, 2:15-24; Ex-1011, 3:8-16, 4:23-35; Ex-1054, 3:49-60, 4:3-5:22, 6:37-49, 7:9-22.)

180. A person of ordinary skill in the art would have drawn upon their experience and skills, as well as the suggestions and teachings of *Spain-I*, *Hunzinger*,

and *Nanda* to, for example, program or configure the MU to implement signal strength number(s) comparison features like that claimed in limitation 1(b) and discussed above and provided by *Nanda* and *Hunzinger*. For example, in some applications, such a configuration which would have predictably resulted in conserved processing and/or memory resources by, *e.g.*, bypassing comparison operations, and any related subsequent location determining operations, in cases where there were no matching signal strengths for the stored stations (or where ID comparisons similar to features described by *Nanda* were integrated with such signal strength comparisons). This scenario could occur when the MU had received signals from stations that were not previously within communication range, and therefore, a fingerprint for those stations was not previously generated and stored in the database. A person of ordinary skill in the art would have appreciated tradeoffs with such a design or implementation by balancing costs, processing requirements, and advantages from such an implementation, and the like to ultimately configure the modified *Spain-I* system/processes with such signal strength number(s) comparison features in a successful manner for a given application, consistent with teachings/suggestions in *Spain-I* (Ex-1011, 1:50-2:20, 3:5-16, 3:34-40, 6:31-7:57, 8:27-13:35.)

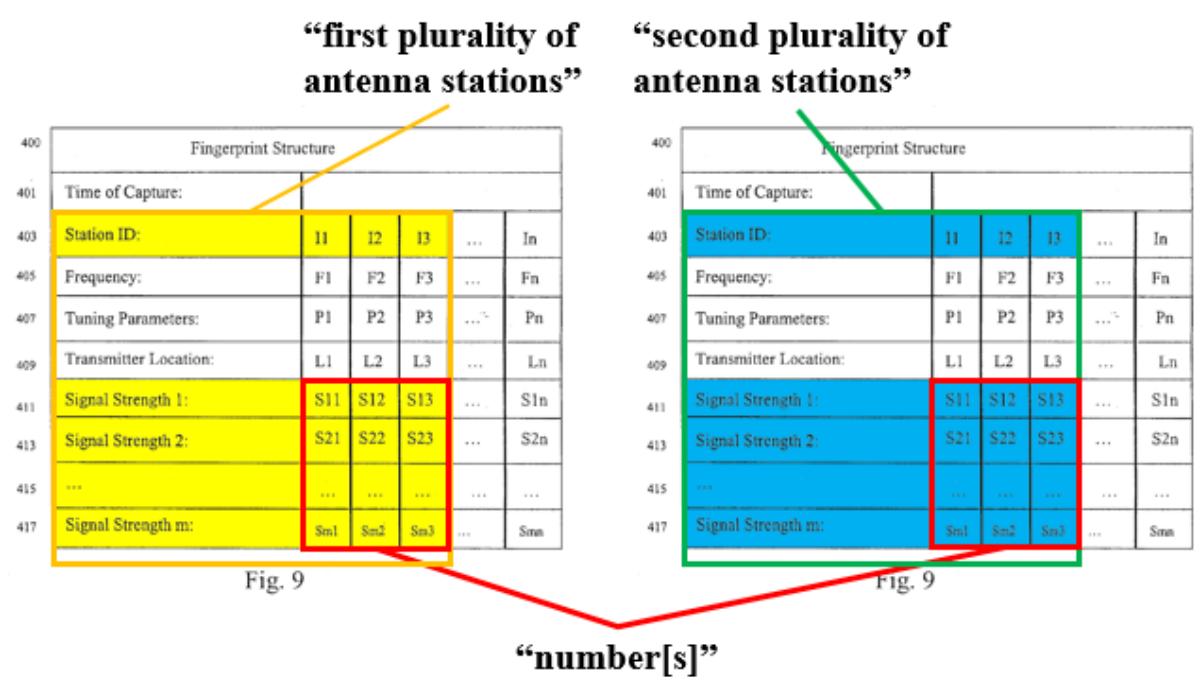
181. Therefore, since the discussed modifications would have harnessed technologies and techniques that were within the capabilities and knowledge of a person of ordinary skill in the art (as demonstrated by *Spain-I-Hunzinger-Nanda* and state-of-art teachings I mentioned earlier), it is my opinion that a person of ordinary skill in the art would have had a reasonable expectation of success in implementing such modifications. The modified system/process consequently would have predictably resulted in the MU performing location determining features consistent with that claimed in limitation 1(b).

182. The modified *Spain* system/process in view of *Hunzinger-Nanda* as I discussed above would have been configured to generate the database on the MU with fingerprint signal strength information for “device-specific target locations” for the reasons I explained previously. (See my above analysis; §IX.A.1(b)(1).) Accordingly, the reference fingerprints associated with such device-specific target locations stored in the database of the MU would have similarly included “at least one number” based on corresponding signal strengths of each of a second plurality of communication signals from a second plurality of antenna stations (SS numbers for respective stations (ID1, ID2, etc.)). (Ex-1011, 12:11-14 (“-11 dBm”), FIGS. 9-10; see my below analysis §IX.A.1(b)(3).) Similarly, based on the aforementioned explanations, the modified *Spain-I* system/processes would have been designed so

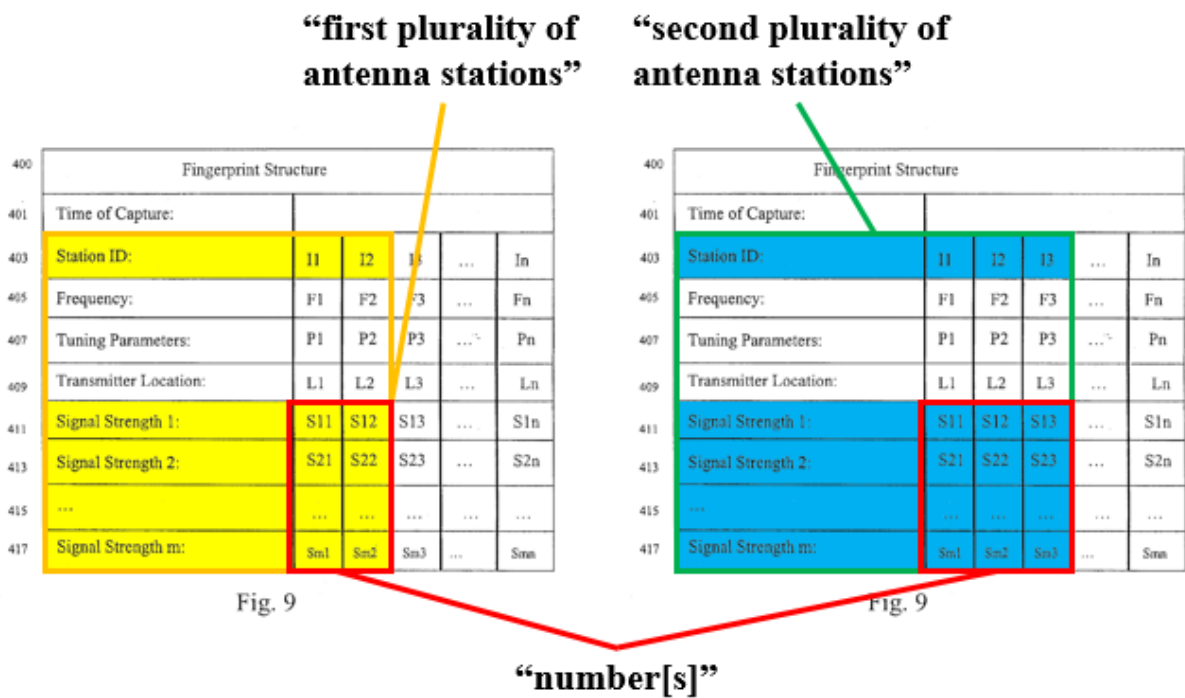
that in the comparison and location determination operations, the MU identifies the second plurality of antenna stations as being within range of the same location as the device-specific target location. These signal strengths would have been determined for the same location as the device-specific target location (*e.g.*, the antenna stations that were in communication range with the MU when sending signals used to generate the signal strength-based fingerprints for the database were the same as those for monitored location fingerprint (*e.g.*, stations ID1, ID2, etc.)).

183. As shown below using Figure 9 of *Spain-I* as an exemplary configuration, the features described by *Spain-I* (in context of *Nanda-Hunzinger*) would have been integrated into the modified system and processes discussed here. In such a setup, numbers based on signal strength (yellow-SS values) for a first plurality of signals received from a first plurality of antenna stations (*e.g.*, station IDs (yellow)) would have been obtained when the MU is at a current location and numbers based on signal strength (blue-SS values) for a second plurality of signals received from a second plurality of antenna stations (*e.g.*, station IDs (blue)), would have been obtained when the MU is at the device-specific target location (§IX.A.1(b)(1)) for the database that is built on a specific MU. (§§IX.A.1(a)-(b); Ex-1011, 12:11-14 (“-11 dBm”), FIGS. 9-10.) Thus, it is my opinion that where the “first” and “second” plurality of stations include the same stations (*e.g.*, three

stations (ID1-ID3 (yellow) and three stations (ID1-ID3 (blue))), the signal strength “numbers” for signals from those stations would be compared in a manner consistent with that I discussed above. (Ex-1011, FIG. 9 (annotated below showing the same three stations as part of the “first” and “second” plurality of stations).)



The same is true where the modified *Spain-I* system involves a “first plurality” and “second plurality” of stations that include respective sets of stations that overlap (but not completely). (Ex-1011, FIG. 9 (annotated below showing a first plurality of stations (ID1-ID2 (yellow)) that overlap with a second plurality of stations (ID1-ID3 (blue))), from which the signal strength numbers from ID1-ID2 in each set of stations would have been compared in accordance with the features discussed).) (*Id.*)



184. It is further my opinion that the MU of the modified *Spain-I-Hunzinger-Nanda* system/processes would have automatically performed the above features corresponding to limitation 1(b) for reasons similar to those I discussed above (§IX.A.1(pre)-A.1(a)) and those I discuss below (§IX.A.1(b)(5)).

(3) At Least One Number Features in Context of Prosecution History Statements

185. I have also been asked to assume a scenario wherein the claimed “at least one number based on...” claim language is interpreted consistent with applicant’s representations in the file histories I discussed above in §VII. (See my above analysis at §VII; Ex-1004, 41-43, 75, 140; Ex-1031, 166-167). As to that

scenario, it is my opinion that a person of ordinary skill would have been motivated to configure the *Spain-I-Hunzinger-Nanda* system/processes to employ a formula, mathematical algorithm, or function (or otherwise derive signal strength number(s) using a signal strength metric) to process and derive the signal strength number(s) based on the measured signal strengths for both the currently monitored location fingerprint and the device-specific target location(s) fingerprint. These derived numbers would serve as the basis for the comparison features that I discussed earlier to determine whether the MU location is in proximity to the device-specific target location, like that claimed in claim 1. This process would have involved evaluating whether the numbers derived from the signal strengths at both locations meet the specified criteria for proximity (*e.g.*, “am I there”). (§IX.A.1(b)(1).)

186. A person of ordinary skill in the art would have recognized that signal strength in the *Spain-I* system/process may be “sampled multiple times for each frequency in order to smooth out any variations.” A person of ordinary skill in the art would have understood that such a configuration suggests that some type of calculation/mathematical normalization would be performed to process and/or generate fingerprint signal strength value(s):

Finally, Signal Strength fields 411, 413, are filled by the mobile unit based on the signal strengths of the received carriers. In one embodiment the **signal strength is**

sampled multiple times for each frequency in order to smooth out any variations. At least one of the Signal Strength fields is required to be filled by the mobile unit.

(Ex-1011, 13:51-55; §§IX.A.1(a)-(b).) In addition, *Nanda* discloses features when generating a fingerprint may include calculated average strength values. For example, *Nanda* explains:

The attributes may be calculated in a variety of different ways without departing from the scope of the present disclosure. For example, an instantaneous measurement may be taken of such attributes as pilot signal strength and phase and used as the fingerprint. However, even when the mobile device is stationary, the values of these attributes vary because of environmental variability. *Accordingly, multiple measurements may be taken and averaged together or otherwise combined in some statistically significant manner in order to generate the fingerprint.*

(Ex-1006, 7:19-28.) (*See also id.*, 6:19-25, 8:29-36 (“mobile device 102 also includes an algorithm executable by the processor 208 for creating multiple fingerprints and comparing different fingerprints to one another”), FIG. 3B (324-326), 11:11-18.) *Hunzinger* also suggests a similar configuration, and discloses that “averaging multiple measurement” in such systems “is well known in the art.” (Ex-1054, 6:17-19.) A person of ordinary skill in the art would have understood that

such exemplary averaging (and related calculation) techniques would have been applicable to fingerprint information (*e.g.*, signal strengths) generated for device-specific target location(s) and current locations and corresponding received fingerprints.

187. Moreover, a person with ordinary skill in the art would have been familiar with techniques for conducting calculations using a formula or a similar mathematical operation with measured signal characteristic data:

Power averaged over a certain duration can be estimated to smooth temporary localized fading and other types of multipath fading caused by obstructions, such as buildings and mountains. According to an illustrative embodiment of the present invention, power averaging can be achieved by using a "rolling window" of signal strength values to determine the averaged signal strength values. That is, as the mobile unit moves, new signal strength values are obtained and used in power averaging.

(Ex-1029, 2:18-29.)

If still participating, step 600 branches to step 602 which represents the client determining whether it is time to send signal strength data to the server. Note that as described above, this transmission time may be a one-time, on-demand reporting, periodic reporting, reporting based on

client signal strengths to base stations changing beyond some threshold (that would be indicative of movement), and other mechanisms, and/or any combination of such mechanisms. If time to send data, step 602 branches to step 604 to send the **signal strengths, preferably smoothed (e.g., averaged)** in some manner over time. Note that to average, scanning should be performed more frequently than reporting.

(Ex-1030, ¶0087 (“signal strengths, preferably smoothed (*e.g.*, averaged)”).)

188. Accordingly, it is my opinion that *Nanda*’s teachings, when considered in the context of *Spain-I* and the understood knowledge in the art, would have motivated a person of ordinary skill in the art to configure the modified *Spain-I-Hunzinger-Nanda* system/process such that the MU performed processes that applied a formula or similar mathematical operation (similar to those discussed in §VII) to refine collected signal characteristic data (*e.g.*, signal strengths) (and generate one or more number(s) based on those signal strengths) to increase the accuracy or confidence in the location proximity determinations performed by the modified system/process by adjusting strength values that compensate for extreme high or low readings/measurements or similar outlier data or adjust for “environment variability” (Ex-1006, 7:19-28), etc., consistent with the teachings in *Nanda-Hunzinger* and *Spain-I* as I discussed above and in §IX.A.1(b)(1). Such a

skilled person would have appreciated that using such formula-based calculations to *e.g.*, smooth or average the collected signal strengths as contemplated by *Spain-I* and *Nanda-Hunzinger* would have been a foreseeable and predictable combination of known techniques and technologies that would have resulted in the MU in the modified *Spain-I* system/process using calculated signal strength number(s) for its comparison technique/features used to cause a determination of whether the MU current location is within proximity of a device-specific target location, like that claimed. Such modifications would have involved use of known features that were within the capabilities and knowledge of a person of ordinary skill in the art (as demonstrated by *Spain-I-Hunzinger-Nanda* and state-of-art teachings above), that would have led such a skilled person to have a reasonable expectation of success in their implementation.

189. In the modified *Spain-I-Hunzinger-Nanda* system and/or processes, the MU would have been configured to automatically perform such above functions corresponding to limitation 1(b), for similar reasons to those I discussed above (§IX.A.1(pre)-A.1(a)) and below (§IX.A.1(b)(5)). Such features would have encompassed comparing the calculated signal strength “number(s)” for each of the first plurality of signals with the calculated signal strength number(s) for each of a second plurality of signals like that discussed above (§IX.A.1(b)(2)) and claimed.

190. Thus, for reasons explained here and in §IX.A.1(b)(1)-(2), it is my opinion that the *Spain-I-Hunzinger-Nanda* combination discloses/suggests the claimed “number based on...” features “whether” such features encompass “signal strength comparison ***directly*** or comparing any ***calculation*** based on signal strength” like that represented during prosecution. (Ex-1004, 42-43; *id.*, 127, 136, 140.)

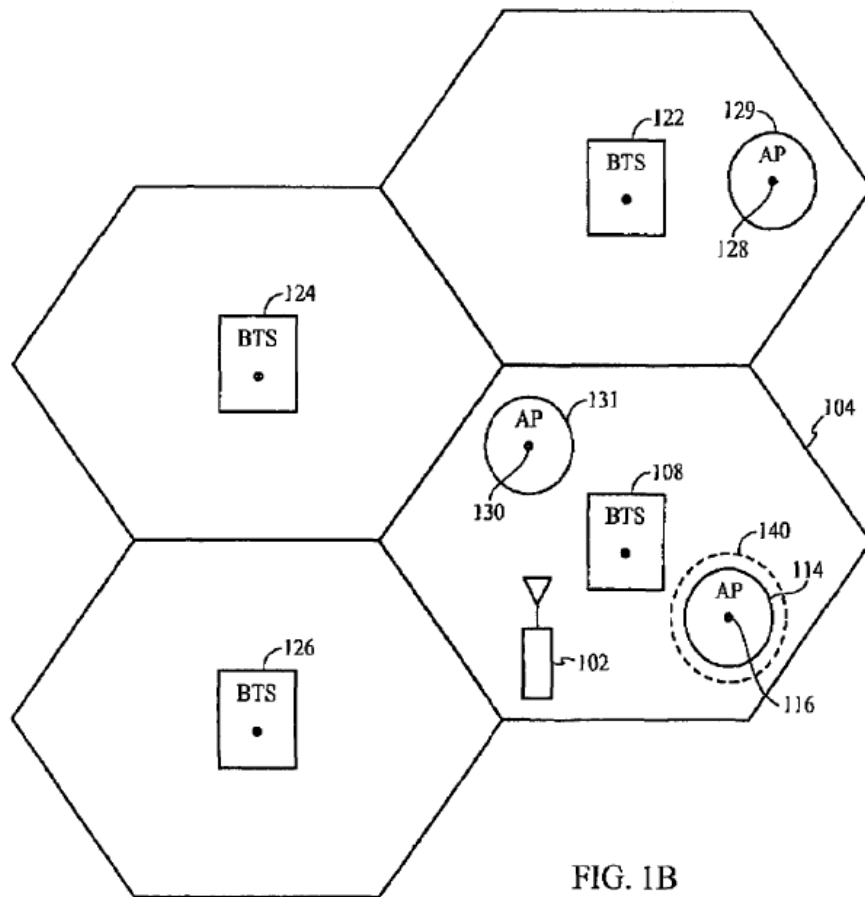
(4) Substantially Continuously Operating Fixed-Location Service Area Antenna Stations

191. As I explained for limitation 1(a), *Spain-I* discloses or suggests that the MU is working in conjunction with the ***substantially continuously operating fixed-location service-area antenna stations*** as claimed. (See my discussions above in §IX.A.1(a).) However, I have also been asked to assume a scenario wherein *Spain-I* does not disclose or does not, by itself, suggest such claimed features. As to that scenario, it is my opinion that a person of ordinary skill in the art would have been motivated to implement them in the above modified *Spain-I* system/processes in view of the teachings of *Nanda* and *Hunzinger*.

192. Upon considering *Hunzinger* and *Nanda* in context of the teachings in *Spain-I*, like that of which I discussed above (§§IX.A.1(b)(1)-(3)), a person of ordinary skill in the art would have been motivated to configure the *Spain-I* system/processes (including as modified above) in such a way so that the MU works in conjunction with substantially continuously operating, fixed-location service-area

antenna stations capable of RF communication with the MU to expand/complement applications compatible with those contemplated by *Spain-I*.

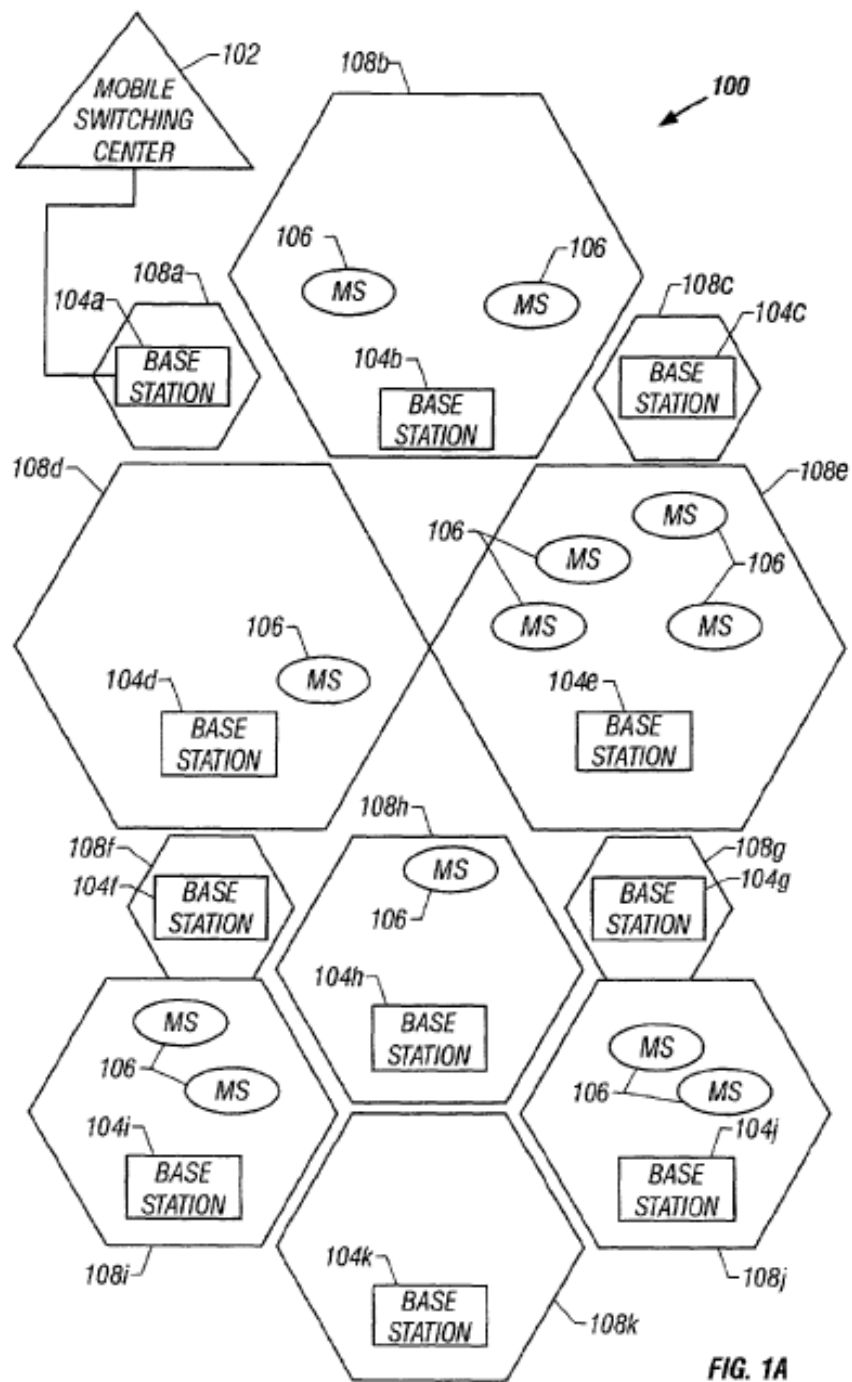
193. For example, in addition to that I discussed above and in §VIII.B, *Nanda* discloses the well-known use of “***fixed base transceiver station[s] (BTS)***” within cell coverage regions that “communicates with mobile users.” (Ex-1006, 1:49-53, 1:29-49; *see also id.*, FIG. 1B (below), 5:15-49.)



194. A person of ordinary skill in the art would have understood that the BTSs and access points are examples of fixed-location service-area antenna stations

that substantially continuously operate, given they are in fixed locations and provide beacon/pilot signals and facilitate radio communications with mobile device 102 within a coverage area provided by such stations.

195. *Hunzinger* also discloses use of known base stations. (Ex-1054, FIG. 1A (below), 1:21-54, 5:6-12, 7:9-14.)



196. In my opinion, a person of ordinary skill in the art would have appreciated that implementing such substantially continuously operating fixed

stations, like those described by *Nanda* and *Hunzinger* (and also as known in the art), would have enhanced the use of *Spain-I*'s MU in such wireless network infrastructures. This would have involved wireless communications between the MU and the stations to facilitate a location-determination process similar to that disclosed by *Nanda* and *Hunzinger*. (See my above analysis in §§IX.A.1(b)(1)-(3).) The disclosures of base stations, wireless communications, and the like in *Spain-I*, coupled with the complementary teachings in *Nanda* and *Hunzinger*, and a person of ordinary skill in the art's knowledge of the art, would have motivated such a skilled person to configure and implement the MU in a wireless network that includes a plurality of such antenna stations that substantially continuously operate to provide communication signals that the MU uses to build the fingerprint database and facilitate location determination processes.

197. A person of ordinary skill in the art would have had the skills and rationale in light of the teachings/suggestions of *Spain-I-Hunzinger-Nanda*, and such a skilled person's state-of-art knowledge, to implement the above-configuration with a reasonable expectation of success for reasons similar to those I explained above in §IX.A.1(b)(1)-(3). Likewise, the above implementations would have involved known technologies/techniques (*e.g.*, use of known antenna stations consistent with that taught by *Spain-I*, *Hunzinger*, and *Nanda*) that would have led

to the MU in the modified *Spain-I* system/processes I discussed above working in conjunction with conventional antenna stations like those contemplated by *Spain-I*, *Hunzinger*, and *Nanda*. (Ex-1011, 3:34-40, 15:19-29.)

(5) Automatically Receiving and Causing a Determination Features

198. It is my opinion that the *Spain-I-Hunzinger-Nanda* system/process would have been configured such that the MU automatically performs processes like those recited in claim 1 for the reasons I previously explained above. (§IX.A.1(pre)-1(b)(4) and *see* my below analysis §IX.A.1(c).) In addition to the reasons discussed above (*id.*), it is my opinion that a person of ordinary skill in the art would have been motivated to configure the MU in the *Spain-I-Hunzinger-Nanda* modified system/processes to automatically perform the above-discussed processes associated with limitations 1(pre)-1(b) as claimed in light of *Hunzinger* and *Nanda*.

199. As I discussed, *Spain-I* as modified by *Hunzinger-Nanda* would have been implemented with an MU that was configured to monitor, measure, and compare numbers based on signal strengths. (§IX.A.1(pre)-1(b).) *Spain-I* also details building the database on the MU by capturing fingerprints at different times, which aims to better enable the “signal characteristics” to account for different patterns and variations in transmitted signals. (Ex-1011, 8:1-8; *id.*, 6:62-65, 7:51-54.) Such disclosures and suggestions in context of *Hunzinger-Nanda* (for reasons

I explained above) would have motivated a person of ordinary skill in the art to consider other ways to control when location-determining operations are performed.

200. For example, both *Hunzinger* and *Nanda* discloses configurations when the mobile device perform periodic monitoring and resulting location determining operations, consistent with that known in the art. For instance, *Hunzinger* discloses that the “mobile may monitor the current location periodically....” (Ex-1054, 4:39-40.) *Nanda* similarly discloses that “when the mobile device 102 periodically awakes...it may also determine its location.” (Ex-1006, 5:41-49, 10:49-57.) And because the *Nanda* location determining process involves a fingerprint capture, the configuration encompasses features where a fingerprint would have been “recorded automatically on a periodic basis.” (*Id.*, 8:30-42, 10:49-11:11, FIG. 3B; §IX.A.1(b).) These teachings and suggestions were consistent with the state-of-art knowledge of a person of ordinary skill in the art and their understanding of such periodic generation/recording of fingerprint information. (Ex-1029, 3:24-41; Ex-1019, ¶0214; Ex-1047, FIG. 7, 13:63-14:1.)

201. Considering such teachings, suggestions, and knowledge, it is my opinion that a person of ordinary skill in the art would have been motivated to configure the *Spain-I-Hunzinger-Nanda* system/process such that MU would have been programmed to periodically (and accordingly automatically) perform the

“receiving...” (1(a)) and “causing a determination...” (1(b)) operations/features like that discussed above (§IX.A.1(pre)-1(b)(4)) and “initiating” features (1(c)) as discussed below (§IX.A.1(c)). Such a skilled person would have recognized the benefits and advantages of integrating these features into the modified *Spain-I* system/processes. Such a skilled person would have thus been motivated to configure such features such that they would have included, for instance, ensuring the location of the MU was monitored and checked automatically at appropriate intervals of time. A person of ordinary skill in the art would have appreciated that implementing such automatic features would have enhanced the location-based action features employed in modified system and processes by, for example, ensuring that the location of the MU was monitored at proper intervals so that appropriate functions or actions were performed when it is determined that the MU was at a device-specific target location corresponding to such an action/operation, as discussed in §IX.A.1(b)(1) (consistent with the teachings of *Hunzinger*). A person of ordinary skill in the art would have recognized in other configurations/applications the advantages in extending the time frame between iterative monitoring operations (and subsequent location determining/comparing operations) to conserve power/processing resources of the MU, depending on the application of the modified system. (Ex-1006, 5:41-49.) Indeed, in such

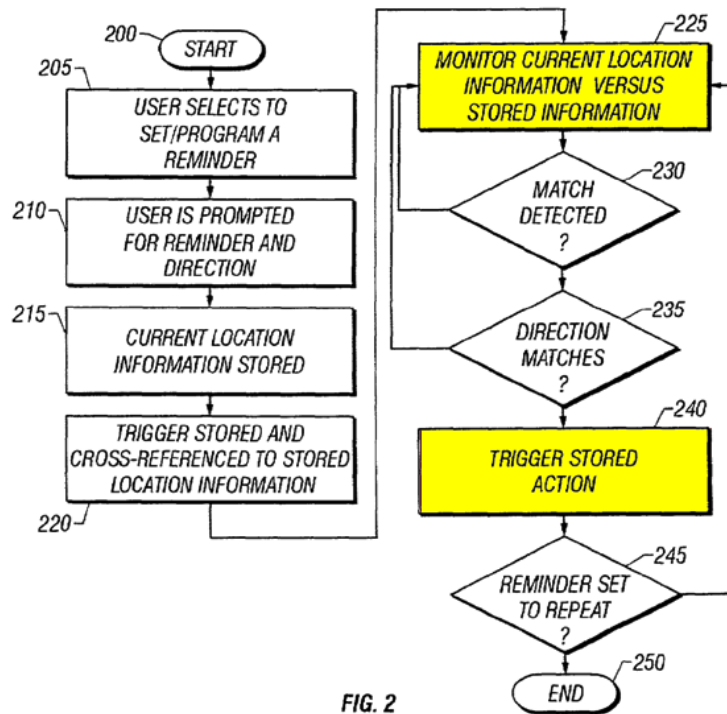
configurations, such a skilled person would have appreciated that a conventional, automatic periodic delay may be “determined in real time based on factors including...maximum estimated or average velocity of the mobile unit in network traffic” and other considerations for a given application/design. (Ex-1029, 3:24-41.) Such modifications, and others similar to them, would have resulted in the MU automatically performing (via program/circuitry, etc.) the claimed processes of limitations 1(a)-1(b).

202. A person with ordinary skill in the art would have possessed the requisite skills, knowledge, rationale, and capabilities to configure and implement such modifications with a reasonable expectation of success. This is especially true because these modifications would have predictably involved the use of known techniques and technologies that are consistent with what was known in the art and were contemplated by *Spain-I* and *Nanda*. (Ex-1006, 8:30-42, 10:49-11:11; Ex-1029, 3:24-41; Ex-1019, ¶0214; Ex-1047, FIG. 7, 13:63-14:1.)

- c) **(c) as a result of the determination that the portable RF communications device is within proximity of the device-specific target location, initiating, on the portable RF communications device, a location-based action associated with the device-specific target location.**

203. In my opinion, the *Spain-I-Hunzinger-Nanda* combination discussed above discloses or suggests this limitation.¹² As I explained above in §IX.A.1(b)(1), the modified *Spain-I* system/processes would have been configured to execute a location-based action when at the target location when the MU is determined to be in proximity of that location in view of *Hunzinger*. (§IX.A.1(b)(1).) There I explained how *Hunzinger* describes initiating location-based actions based on a determined/selected MU target location. (*Id.*; Ex-1054, Abstract, FIGS. 1A-4, 1:38-2:6, 2:10-44, 3:4-67, 4:1-5:22, FIG. 2 (below) (“If a stored reminder matches this information [area condition] then...the associated action is executed.”), 5:23-40.) (*See also* my discussions above in §VIII.F.)

¹² *Blomqvist* also discloses location-based action features as claimed (*see* my discussions of *Blomqvist* below in §IX.B.) Thus, *Blomqvist*’s additional teachings would have further motivated a person of ordinary skill in the art to configure the modified *Spain-I* system in a manner that discloses or suggests limitations 1(c) and 15(c) (§IX.A.4) for the same reasons as I explain in this section in light of *Spain-I-Hunzinger-Nanda*.



Furthermore, and similar to the location-based services envisioned by *Spain-I* and *Hunzinger*, *Nanda* suggests configuring an MU to automatically look for a wireless LAN access point when the device-specific target location is detected. (§IX.A.1(b); Ex-1006, 2:16-59, 5:15-49, 11:20-32.) My analysis above in §IX.A.1(b) explains why a person of ordinary skill in the art would have been motivated by such teachings in *Hunzinger* to configure the MU in the modified *Spain-I* system/processes to initiate/perform a location-based action associated with the chosen device-specific target location upon determining that the MU is within proximity of the device-specific target location, similar to that claimed here in limitation 1(c). (See my discussions above in §IX.A.1(b).)

204. Thus, for similar reasons, upon considering the teachings of *Hunzinger* and *Nanda*, it is my opinion that a person of ordinary skill in the art would have been motivated to configure the MU of the modified *Spain-I* system/process (§IX.A.1(pre)-1(b)) such that as a result of the determination that the MU is within proximity of the device-specific target location (§IX.A.1(b)), the MU automatically initiates a location-based action (similar to that taught and suggested by *Hunzinger* (and *Nanda*)) associated with the device-specific target location. Such a skilled person would have had the same skills, motivation, capabilities, knowledge, and expectation of success as I described above in §IX.A.1(b)(1) (regarding use of location-based actions assigned to user selected locations (device-specific target locations)) and in §IX.A.1(b)(5) (automatic features). (*See also* Ex-1054, FIGS. 2-3, 3:61-66, 4:60-5:22 (“If a stored reminder matches this information [exit of area] then...the associated action is executed.”), 5:23-40.)

2. Claim 8

- a) **The method of claim 1 wherein the at least one number based on the signal strengths of each of the first plurality of communications signals from the first plurality of antenna stations is more than one number, each of which number is based on the signal strength of one of the first plurality of communications signals from only one of the first plurality of antenna stations.**

205. It is my opinion that *Spain-I-Hunzinger-Nanda* discloses/suggests this limitation. (§IX.A.1.) As I discussed for claim 1, the *Spain-I-Hunzinger-Nanda* combination discloses/suggests comparing numbers based on signal strengths of respective signals received from respective stations for received signals and device-specific target locations. (§IX.A.1(b); Ex-1011, 4:42-63, 5:61-6:4; Ex-1006, FIG. 3B, 8:29-36.) For instance, *Spain-I* describes measuring multiple signal strengths for the signal received from a single respective station in range of the MU (e.g., Station I1 (SS1-Sm1) (yellow below), Station I2 (S12-Sm2) (blue), etc.). (§IX.A.1; Ex-1011, FIG. 9 (below).) Such operations occur when the MU is at the current monitored location, and at the target location(s) (for example when the MU is configured to build its fingerprint/location database). As I also explained, the signal strengths in the database are compared to the monitored signal strengths:

When a location estimate of the mobile unit is desired (either by the mobile unit itself or by the location server), it activates component 101 (FIG. 2), which captures predetermined information from a predetermined portion of the RF spectrum. Instructions regarding what information to capture and the portion of the RF spectrum from which to capture may be either pre-programmed in the mobile unit, or generated in real time. In the latter case, it may be generated in the mobile unit, or downloaded into

the mobile unit from the location server over the wireless network. The mobile unit may capture multiple pieces of information or from multiple portions of the spectrum.

The spectral fingerprint may be generated using many different parameters, either individually or in combination. In one embodiment, signal strength is used. In another embodiment, phase information is used. In another embodiment, the identity of the received signals (*e.g.*, frequency) is used. In yet another embodiment, the identity of the signal source (*e.g.*, channel number or station code) is used. In yet another embodiment, the geographic locations of the transmitters from which the signals originate are used.

....

Once the fingerprint is generated, its association with a certain location has to be determined. According to this invention this is done by utilizing a fingerprint database that contains a number of fingerprints along with their corresponding location identities.

(Ex-1011, 4:42-63, 5:61-6:4; §IX.A.1.)

400	Fingerprint Structure					
401	Time of Capture:					
403	Station ID:	I1	I2	I3	...	In
405	Frequency:	F1	F2	F3	...	Fn
407	Tuning Parameters:	P1	P2	P3	...	Pn
409	Transmitter Location:	L1	L2	L3	...	Ln
411	Signal Strength 1:	S11	S12	S13	...	S1n
413	Signal Strength 2:	S21	S22	S23	...	S2n
415	...	...	...	...	...	...
417	Signal Strength m:	Sm1	Sm2	Sm3	...	Smn

Fig. 9

206. For reasons explained (§IX.A.1(b)), the modified *Spain-I* system/process would have been configured to perform comparison and determination operations as recited in claim 1, where multiple “number(s)” based on responsive signal strengths were used for the monitored location (§IX.A.1(a)) and the stored location to build the database and resulting comparison processes like that claimed (§IX.A.1(b)).

207. *Nanda* also discloses collecting signal characteristic data, which includes numbers based on signal strength, for the signals received from different stations. Additionally, the disclosure involves comparing the multiple signal strengths for the signal received from each respective station. This approach is

integral to the location-based functions discussed in *Nanda*. (Ex-1006, FIG. 3B (below).)

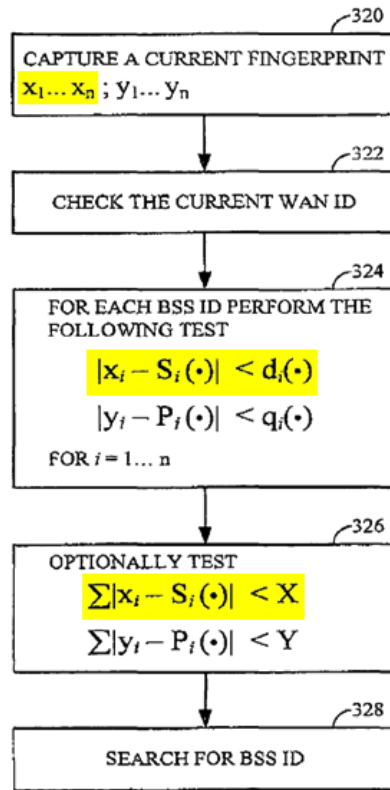


FIG. 3B

Nanda further explains:

Thus, at any location within the network 104, the mobile device 102 observes up to n base stations with measurable signal strengths which can be characterized as two vectors $x_1, \dots, x_n$, and $y_1, \dots, y_n$. Where each x value is a signal strength of a pilot signal from a base station and each y value is a phase of the pilot signal from a base station.

(*Id.*, 5:57-63.) Also, that:

Referring back to the previously mentioned fingerprints, the mobile device 102 also includes an algorithm executable by the processor 208 for creating multiple fingerprints and comparing different fingerprints to one another. For example, using the keypad 212, a user of the mobile device 102 may select a key that causes the mobile device 102 to create a current fingerprint and store that fingerprint in memory 211. If at the time the fingerprint is created, the mobile device is connected to a wireless LAN, then the stored fingerprint may be associated with that wireless LAN access point. In addition, the fingerprint can also be recorded automatically on a periodic basis or at programmatic events such as successful access, successful access with desired quality of service, etc.

As a result of the above process, the memory 211 may contain a wireless LAN search table arranged, for example, similar to the following table:

WAN ID	WLAN SSID	WLAN BSS ID	Signal Strength	Phase
A	I1	A ₁	s ₁ (A ₁) . . . s _n (A ₁)	p ₁ (A ₁) . . . p _n (A ₁)
		A ₂	s ₁ (A ₂) . . . s _n (A ₂)	p ₁ (A ₂) . . . p _n (A ₂)
	I2	A ₃	s ₁ (A ₃) . . . s _n (A ₃)	p ₁ (A ₃) . . . p _n (A ₃)
B	I1	B ₁	S ₁ (B ₁) . . . s _n (B ₁)	
	I2	B ₂	S ₁ (B ₂) . . . s _n (B ₂)	

(*Id.*, 8:29-55.) *Nanda* explains:

The first column of the table refers to the WAN ID of the WAN. The WAN ID identifies the system and network for the WAN known as the SID/NID in the wide area wireless system. The particular base stations in the WAN may be identified by the pilot offsets, pilot signal strengths or other attribute which are part of the finger print as discussed below.

(*Id.*, 8:56-61.) Also:

The fingerprint identifies the location of the mobile device. The second column refers to the text identifier of the WLAN network. The third identifier refers to wireless LAN access points (also known as BSS). In the exemplary table there are three access points (A1, A2, A3) within the first coverage area of base station A. Similarly, there are two access points within the coverage area of the base station B. There may, of course, be many more wireless LANs within the areas covered by any WAN ID but the user of the mobile device may not be interested in those access points because they are associated with wireless LANs that the user may not be permitted to access. Accordingly, the table may merely include a fingerprint for those access points to which the user typically connects.

(*Id.*, 8:61-9:7.)

The two remaining columns include the values that comprise the fingerprint itself. In this example table the fingerprints for the access points A1, A2, and A3 include both strength and phase information. However, the fingerprints for the access points B1 and B2 comprise only signal strength information. Also note that although each fingerprint in this table is denoted by a vector of length n , there may be less than n non-null components of the vector.

(*Id.*, 9:8-15.) Further, *Nanda* explains that the “comparison of a current fingerprint to a stored fingerprint can be performed in a variety of ways.” (*Id.*, 10:14-15.) “The attributes that make up the fingerprint may have values that vary (even for the same location) or are difficult to measure with a high degree of accuracy. Thus, a comparison between fingerprints should not rely on exact duplicity as a test to determine a match.” (*Id.*, 10:20-24.) “To handle such variability of the fingerprints, a ‘deviation’ amount is defined that helps control the determination of whether a fingerprint matches a stored fingerprint.”

WAN ID	WLAN BSS ID	Signal Strength	Strength Deviation	Phase	Phase Deviation
A	A ₁	s ₁ (A ₁) . . . s _n (A ₁)	d ₁ (A ₁) . . . d _n (A ₁)	p ₁ (A ₁) . . . p _n (A ₁)	q ₁ (A ₁) . . . q _n (A ₁)
	A ₂	s ₁ (A ₂) . . . s _n (A ₂)	d ₁ (A ₂) . . . d _n (A ₂)	p ₁ (A ₂) . . . p _n (A ₂)	q ₁ (A ₂) . . . q _n (A ₂)
	A ₃	s ₁ (A ₃) . . . s _n (A ₃)	d ₁ (A ₃) . . . d _n (A ₃)	p ₁ (A ₃) . . . p _n (A ₃)	q ₁ (A ₃) . . . q _n (A ₃)

Nanda explains:

The above table includes a deviation value for the signal strength and a separate deviation value for the phase portion of the fingerprint. Use of these values is explained with respect to the flowchart of FIG. 3B. In step 320, the mobile device awakens or is otherwise controlled to capture a fingerprint of its current location. Continuing the example where the fingerprint has a vector for signal strengths and one for phases, a pair of vectors are collected $x_1 \dots x_n$ and $y_1 \dots y_n$.

(*Id.*, 10:49-57.)

In step 322, the current WAN ID is checked and the table entries for access points associated with that WAN ID are determined. Further search refinements are possible by searching the database for identifiers of the observable pilots. For the CDMA network the search criterion can be PN phase offsets of the observable pilots. Next the fingerprint for each of these access points is then compared, in step 324, to the current fingerprint to

determine if there is a match. Algorithmically, the comparison and determination is performed by:

For $i = 1$ to n :
determine if $|x_i - s_i(\cdot)| < d_i(\cdot)$
determine if $|y_i - p_i(\cdot)| < q_i(\cdot)$

Thus, the deviation values d and q can be used to select how closely the current finger print (x and y vectors) must match a stored finger print (s and p vectors). The larger the deviation values, the more the values can differ and there still be a match.

(*Id.*, 10:58-11:10.)

If there is a match at step 324, in step 326 an optional comparison may be made to determine whether the sum of all differences for a given access point (*e.g.* $|x_i - s_i(\cdot)|$ and $|y_1 - p_i(\cdot)|$) also fall below a respective threshold (*e.g.*, X and Y). This additional test can help catch certain scenarios where the individual differences may show a match but when the fingerprint is considered in total, it can be determined that there is no match.

(*Id.*, 11:11-19.) (*See also* my discussions above in §IX.A.1(b).)

208. Considering such teachings, and the reasons similar to those explained above for claim 1, it is my opinion that a person of ordinary skill in the art would

have been motivated to configure the *Spain-I-Hunzinger-Nanda* system/process such that the location determining operations discussed above for limitation 1(b) included comparing multiple signal strengths based numbers, such that more than one number based on the signal strengths of each of the first signals from the first antenna stations is more than one number, where each of which number is based on the signal strength of one of the first signals from only one of the first antenna stations, as recited in claim 8. (§IX.A.1; Ex-1011, 4:42-63, 5:61-6:4; Ex-1006, FIG. 3B, 6:12-25, 8:29-9:15, 10:49-11:19.) *Spain-I* and *Nanda* both disclose monitoring of signal strength for each base station and the comparison of these signal strengths through fingerprint comparison operations. Such features would have been implemented in the modified *Spain-I* MU system/process when determining if the MU is in proximity of the device-specific target location that I discuss for limitation 1(b). (§IX.A.1(b); §§IX.A.1(pre)-IX.A.1(a); Ex-1011, 4:42-63, 5:61-6:4; Ex-1006, FIG. 3B, 6:12-25, 8:29-9:15, 10:49-11:19.)

209. A person of ordinary skill in the art would have had similar reasons/knowledge/skills and expectation of success to configure/implement such features as recited in claim 8 as explained for claim 1. (§IX.A.1(b).) Thus, the modified *Spain-I-Hunzinger-Nanda* system/process discloses/suggests the “number(s)” features recited in limitation 1(b) in context of claim 8 for the same

reasons explained above in §IX.A.1(b)(2) (*e.g.*, whether the “number(s)” reflect the signal strength measurement values as discussed in §IX.A.1(b)(2)) and the reasons in §IX.A.1(b)(3) in view of *Nanda* (*e.g.*, whether the “number(s)” are a result of a formula applied to such collected/measured strength information (*e.g.*, calculated averages, other mathematical operations, etc.) like that discussed in §IX.A.1(b)(3)).

210. In one non-limiting example using *Spain-I*'s FIG. 9 (above) as an example, the modified *Spain-I* system/process would have been configured such that the “at least one number...is more than one number...” (*e.g.*, whether a signal strength value (§IX.A.1(b)(2)) or a value derived from signal strengths (§IX.A.1(b)(3))) as claimed. A person of ordinary skill in the art, consistent with my previous explanations, would have had the motivation to configure the modified system for one application such that multiple signal strengths (S11-Sm1) for a signal received from station ID1 (yellow) were averaged/smoothed, etc. (*Nanda*) to generate a number (*e.g.*, a signal strength metric) for only that antenna station (ID1). Such a configuration would also entail that the signal strengths (S12-Sm2) for received signal(s) from a different station ID2 (blue) were averaged/smoothed, etc. to generate a second number like that claimed (*e.g.*, a second signal strength metric) (“more than one number”) for only that different antenna station (ID2), consistent with the teachings in *Spain-I* and *Nanda*. As configured, such a number/signal-

strength metric would have included more than one number like that claimed. (*See* my above analysis here and §IX.A.1(b).) Such features would have been employed to the monitored MU location (“of each of the first plurality of communications signals from the first plurality of antenna stations”) (§IX.A.1(a)). Such features would have been consistent with those of claim 8 as claimed and with those discussed during prosecution (Ex-1004, 81-82).

3. Claim 14

- a) The method of claim 1 wherein the determination of whether the portable RF communications device is within proximity of the device-specific target location is performed at a location remote from the portable RF communications device.**

211. It is my opinion that *Spain-I* in view of *Hunzinger* and *Nanda* discloses/suggests these limitations. (§IX.A.1.)

212. As I discussed in §IX.A.1(b), a person of ordinary skill in the art would have been motivated to configure the modified *Spain-I-Hunzinger-Nanda* system/processes such that the MU automatically determines whether the MU monitored location is within proximity of the device specific target location in the fingerprint database that is located on the MU, like that claimed. (§IX.A.1(b).) *Spain-I* further describes implementations where the fingerprint database may be stored at a server that is remote to the MU, and that such a remote server may perform

location determining processes, including comparison operations to “search for the closest matching fingerprint.” (See my above analysis §§IX.A.1, IX.A.4; Ex-1011, FIG. 3 (below), 6:9-30; Ex-1005, FIG. 3, 4:28-58; Ex-1009, 5:22-42; Ex-1010, 5:20-41.)

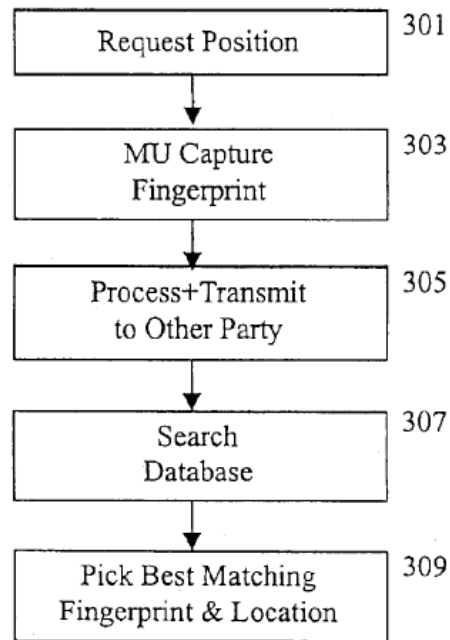


Fig. 3

Nanda similarly teaches and suggests configurations where the mobile device creates and/or sends fingerprint(s) to a remote database, such as to perform functions for location determinations. (Ex-1006, 12:14-31.)

213. Guided by such teachings and suggestions and especially when considering the rationale, teaching, and suggestions above (§IX.A.1(b)), it is my opinion that a person of ordinary skill in the art would have been motivated and had good reason to implement the MU of the modified *Spain-I* system such that it is configured to operate by working with a remote fingerprint database/server (*e.g.*, location server). In such a configuration, the MU would be enabled to generate or provide fingerprint information (number(s) based on signal strengths, other fingerprint information (station ID, etc.)) when receiving current fingerprint information and for constructing the database for/at device-specific target locations (§IX.A.1(b)(1)) using a remote server for storage and for subsequent location determining analysis by the remote server (like that discussed above for limitation 1(b)). And such modifications would have resulted in the system/processes to automatically (and predictably as evidenced by the relevant teachings and suggestions) perform the determining whether the MU is within proximity of the device-specific target location at a location remote (*e.g.*, server 30) from the MU. (*See my above analysis.*) Such features were consistent with the remote processing and storage features disclosed by *Spain-I* and *Nanda* and understood in the art.

214. It is my opinion that a person of ordinary skill in the art would have recognized the benefits and advantages of these modifications and thus would have

been motivated to consider and implement such features. One such benefit/advantage would have been to reduce processing/storing requirements of the MU, which, for example, would have otherwise been used to locally build/store and process fingerprint data in a database. Such a modification and its benefits/advantages was in accordance with known fingerprint-based location applications. (Ex-1011, FIG. 3, 6:9-14, 6:15-30; Ex-1006, 12:14-31; Ex-1028, 16:50-64.) Such a skilled person would have had similar rationale, capabilities, expectation of success, and state-of-art knowledge for designing or implementing such aspects for the system/process when considering *Nanda* and *Spain-I* for claim 1 (§§IX.A.1(b)), and thus would have predictably led to the modified *Spain-I* system/processes as discussed and recited in claim 14.

215. Furthermore, a person with ordinary skill in the art would have recognized other advantages associated with using a remote server, as discussed earlier, when contemplating the potential applications of the modified system/processes. This recognition would stem from a comprehensive understanding of the art and the various benefits that remote server-based solutions can offer in different scenarios and use cases. For example, where a mobile device creates/sends fingerprint(s) to a remote database that was configured to “receive fingerprints from multiple mobiles devices,” such a skilled person would have

learned from *Nanda* that the features would have allowed for a “much larger database of available access points than would be found in a single mobile device.” (Ex-1006, 12:14-31.) These teachings and considerations would have motivated a person with ordinary skill in the art to contemplate and configure the modified *Spain-I* system/processes in a way that involves the remote server receiving signal strength data from multiple Mobile Units (MUs) to construct a robust remote fingerprint database. This configuration aligns with the features contemplated in *Spain-I* and *Nanda* and reflects a practical and advantageous approach to database construction for various applications. (See my above analysis.) Incorporating these features would have enabled the modified *Spain-I* system/processes (as detailed in §IX.A.1) to establish and maintain a remote database of fingerprints using signal strength data from multiple Mobile Units (MUs) as suggested (Ex-1006, 12:26-29), thus beneficially expanding applications of the modified *Spain-I* system/processes. Such a skilled person would have had similar rationale for considering such features from *Nanda* (and *Spain-I*) as those explained above for claim 1 (§IX.A.1(b)), as well as had similar capabilities/expectation of success/state-of-art knowledge, that would have led to such alternate modifications. (See also Ex-1011, 3:34-40 (*Spain-I* contemplated designs that complemented/augmented existing technologies).)

4. Claim 15

216. Claim 1 and claim 15 contain limitations that are nearly identical in their wording. Both claims describe similar features or elements. (*Compare* Ex-1001, 26:49-27:11 *with id.*, 28:6-35.) Although the preamble of claim 15 recites some different features (which I address below in §IX.A.4(pre)), limitations 15(a)-15(c) track those of limitations 1(a)-1(c). It is thus my opinion that *Spain-I* in view of *Hunzinger* and *Nanda* discloses and/or suggests the limitations of claim 15 for the same reasons for claim 1 and those below.

[pre] A portable RF communications device comprising an antenna, a user interface, and a storage device, wherein the storage device contains computer program code that, when executed by the portable device, controls the portable device to cause the portable device to perform a location-determining method, the method comprising automatically:

217. I have been asked to assume that the preamble of claim 15 is limiting. Under that assumption, it is my opinion that *Spain-I* (including its incorporated disclosures and as modified as I explain for claim 1 and below) discloses or suggests these limitations.

218. In addition to the discussions and analysis I included above for limitations 1(pre)-1(c) (§IX.A.1), *Spain-I* discloses that the MU, among other

features, comprises an antenna 102 used for RF communications in the network.
(Ex-1011, 4:7-22, FIGS. 1, 2 (below showing antenna 102 (blue)).)

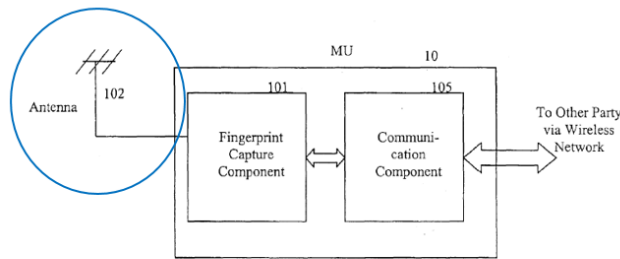


Fig. 2

219. *Spain-I* also suggests that the MU is configured with software and a storage device to store such code and a fingerprint database. A person of ordinary skill in the art would have understood that such disclosed configuration facilitates the execution of the location-determining processes described in *Spain-I*, enabling the MU to perform its location-based functions. (§IX.A.1(pre)-1(c); Ex-1011, 3:55-60 (MU is “equipped with circuitry and software that is capable of capturing information....”), 5:20-22 (“software to capture the required signals and their parameters”), 5:55-6:7 (preprocessing of captured signals, database “stored in the mobile unit”, comparing fingerprints, search algorithm, etc.), 8:1-26 (database and decision/search algorithms), 14:23-37 (“algorithms” performed by MU), 15:19-25 (invention can be implemented with only “minor software changes in the mobile unit”)) *Spain-I* also details, as I explained above for limitation 1(b), features where

a user can initiate a request causing “the MU [to] capture[] the fingerprint of its current location.” (§IX.A.1(b)(1); Ex-1011, FIG. 3, 6:9-30.)

220. A person with ordinary skill in the art would have recognized that there were various ways and reasons for configuring the MU, and they would have been motivated to consider established practices and teachings in the art when contemplating the design and functionality of the MU. This approach would have included configuring the MU to align with standard design practices for mobile devices to meet the requirements of various applications. Upon doing so, and in addition to the reasons above (§IX.A.1(b)(1)-(5)), such a skilled person would have been persuaded by *Hunzinger’s* and *Nanda’s* teachings and been motivated to configure *Spain-I’s* MU to include a well-known and conventional user interface, and a storage device containing computer program code that, when executed by the MU, controls the MU to cause it to perform a location-determining method with automatic steps like those recited in claim 15.

221. My above analysis (§IX.A.1(b)(1)) demonstrates that a person of ordinary skill in the art would have been motivated to configure the MU of the modified *Spain-I* system with such a user interface based on the suggestions of *Hunzinger-Nanda*. (§IX.A.1(b)(1); *see also* my discussions in §§IX.A.1(pre), IX.A.1(a)-(c).) My above analysis for claim 1 (§IX.A.1(b)) also explains how and

why such a skilled person would have been motivated and had good reason to design or implement the modified *Spain-I-Hunzinger-Nanda* system/process with such a user interface to enable a MU user to choose device-specific target location(s) and corresponding action(s) that are executed when it is determined the MU is in proximity of a respective target location. (*Id.*; Ex-1054, FIGS. 1A-3, 4 (below), 1:38-2:6, 2:10-44, 3:4-67, 4:1-6:22, 7:9-22; Ex-1006, 7:20-45, 8:29-42.)

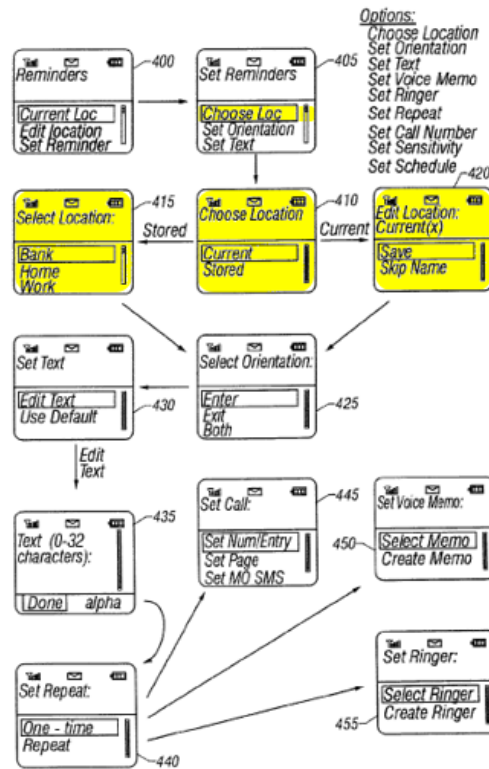


FIG. 4

222. *Hunzinger* and *Nanda* also disclose components commonly found in mobile devices, such as processors, memory, and so on. These components are described in the context of being used by the device for executing “programmed”

features related to the location-determining operations discussed in these references. This information provides insight into the technical capabilities and functionalities of the mobile device, which are relevant for the implementation of such location-based operations. (Ex-1054, 2:29-38 (“programmed” conditions/reminder(s)), 2:58-60 (FIG. 2 showing location reminder “programming...procedures”), 2:66-67 (FIG. 4 is a “user interface design...user programming of location reminders”), 3:44-48 (FIG. 1B (below) showing mobile terminal with processor and memory where the *“processor 152 may be driven by a program stored in the memory 154”*), 3:49-4:59 (discussing FIG. 2), 5:23-6:22 (FIG. 4).)

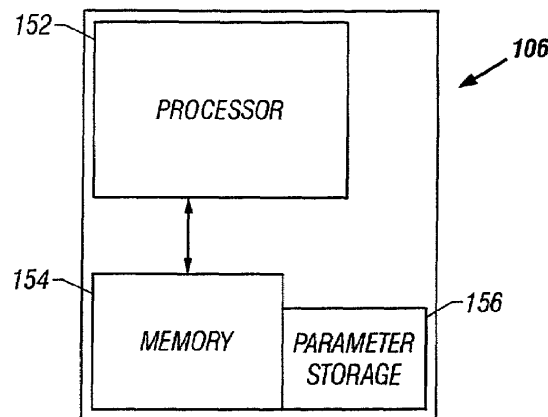


FIG. 1B

(Ex-1006, FIG. 2 (below), 7:29-8:13 (describing mobile device processor 208 (can be implemented as “software” and “hardware”) and supports “software applications”, supports software signal processing, etc., but may be implement based on “particular application”/design constraints, and configured to “execute an

algorithm” (software applications)), 8:29-41 (processor 208 executes algorithm for creating and comparing fingerprints).)

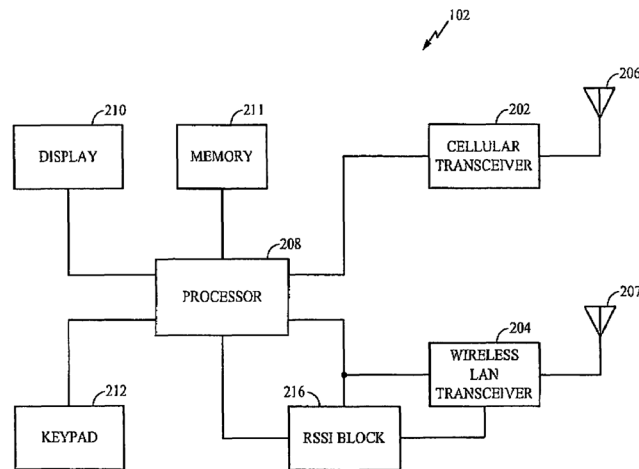


FIG. 2

223. Accordingly, it is my opinion, in addition to the reasons that I discussed above for modifying *Spain-I* (§§IX.A.1(b)(1)-(5)), that a person of ordinary skill in the art would have been motivated in view of the additional teachings of *Hunzinger-Nanda* to design or implement the *Spain-I* system/process (discussed above for claim 1 and as modified) to include a user interface, processor, and memory storing program code executed by the processor like that claimed to execute such location determining processes discussed above for limitations 1(a)-1(c), which track those of limitations 15(a)-15(c). (§§IX.A.1; IX.A.4(a).) Indeed, the teachings/suggestions of *Hunzinger-Nanda* in context of those from *Spain-I* (including those regarding

algorithms/software, etc., discussed above here) would have led such a skilled person to configure the MU with features like those claimed in limitation 15(pre).

224. A person of ordinary skill in the art would have had the skills, knowledge, and capabilities to configure and implement such modifications as described, especially since they would have entailed the utilization of technologies and techniques well within the grasp of a person with ordinary skill in the art, as evidenced by *Spain-I-Hunzinger-Nanda*. This would have led such an individual to have a reasonable expectation of success in implementing such modifications, underscoring the practical and feasible nature of the suggested changes. In all, it is thus my opinion that *Spain-I* (including as modified in view of *Hunzinger-Nanda*) discloses/suggests features recited in limitation 15(pre) for reasons above and those for claim limitation 1(pre) (and 1(a)-1(c)). (§IX.A.1(pre)-1(c).)

- a) (a) receiving a first plurality of communications signals, each received from one of a first plurality of antenna stations within range of the portable RF communications device, wherein the antenna stations are fixed-location service-area antenna stations and are substantially continuously operating;**
- b) (b) causing a determination of whether the portable RF communications device is within proximity of the device-specific target location by electronically comparing at least one number based on signal strengths of each of the first plurality of communications signals with at least one number based on corresponding signal strengths of each of a**

second plurality of communication signals from a second plurality of antenna stations that have been identified as being within range of the same location as the device-specific target location, which signal strengths have been determined for the same location as the device-specific target location; and

- c) (c) as a result of the determination that the portable RF communications device is within proximity of the device-specific target location, initiating, on the portable RF communications device, a location-based action associated with the device-specific target location.**

225. It is my opinion that *Spain-I* in view of *Hunzinger* and *Nanda* discloses/suggests limitations 15(a)-15(c) for the same reasons as those I discussed for limitations 1(a) through 1(c) and the reasons detailed above for limitation 15(pre). (IX.A.1(1)-(c); IX.A.4 (pre).)

5. Claim 22

- a) The portable RF communications device of claim 15 wherein the at least one number based on the signal strengths of each of the first plurality of communications signals from the first plurality of antenna stations is more than one number, each of which number is based on the signal strength of one of the first plurality of communications signals from only one of the first plurality of antenna stations.**

226. It is my opinion that *Spain-I* in view of *Hunzinger* and *Nanda* discloses and/or suggests this limitation for the same reasons as those I discussed for claims 8 (which recites the same features) and 15. (§§IX.A.2, IX.A.4.)

6. Claim 28

- a) The portable RF communications device of claim 15 wherein the determination of whether the portable RF communications device is within proximity of the device-specific target location is performed at a location remote from the portable RF communications device.**

227. It is my opinion that *Spain-I* in view of *Hunzinger* and *Nanda* discloses and/or suggests this limitation for the same reasons as those I discussed above for claims 14 (which recites the same features) and 15. (§§IX.A.3, IX.A.4.)

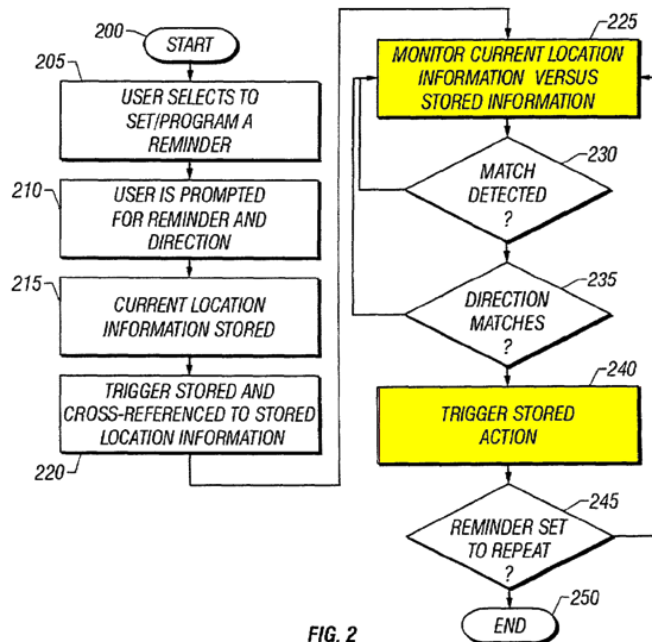
B. *Spain-I* in View of *Hunzinger*, *Nanda*, and *Blomqvist* Discloses and/or Suggests the Features of Claims 4 and 18

1. Claim 4

- a) The method of claim 1 wherein the location-based action comprises launching a computer program application on the portable RF communications device.**

228. It is my opinion that *Spain-I* in view of *Hunzinger*, *Nanda*, and *Blomqvist* discloses and/or suggests these limitations. (§§IX.A.1, VIII.E) My above analysis explains how the *Spain-I-Hunzinger-Nanda* combination discloses and/or suggests determining if the MU is within proximity of a device-specific target location, like that claimed. (See my discussions in §IX.A.1(b).) Furthermore, the MU in the modified system/process would have been configured to perform a location-based action when such proximity is determined, consistent with that taught

by *Hunzinger* and that discussed for limitation 1(c). (§IX.A.1(c); *see also* §IX.A.1(b); Ex-1054, FIGS. 2 (below), 3-4, 3:61-66, 4:60-5:40.)



229. Given *Spain-I* also discloses location-based service features (Ex-1011, 3:8-16 (location server interested in MU location for providing “personalized services,” etc.)), a person of ordinary skill in the art would have had reasons to consider teachings in the art providing details regarding MU-based features that would leverage the location determining features and location-based actions discussed above, including use of a location-based software applications known to be available in mobile devices at the time. In view of *Hunzinger* and *Blomqvist* (*see* my analysis above and below), it is my opinion that a person of ordinary skill in the

art would have been motivated to configure the *Spain-I-Hunzinger-Nanda* system/process such the location-based action of the MU comprises launching a computer program application on the MU like that claimed. As I explained above, *Hunzinger* discloses a mobile device performing selected actions based on a determination whether the MU current location is at, entering, or left a user chosen location assigned to such action(s) (Ex-1054, FIGS. 1A-4, 1:38-2:44, 3:4-67, 4:1-6:22, 6:37-49, 7:9-22), and based on such teachings (among others), the modified *Spain-I-Hunzinger-Nanda* system/processes would have implemented similar features in relation to device-specific target locations. (See my discussions above in §IX.A.1(b).)

230. *Blomqvist*, similar to *Spain-I*, *Nanda*, and *Hunzinger*, discloses systems and processes related to location services for mobile devices; the reference provides information and details relevant to location-based functionalities and technologies used in the context of mobile devices. For example, *Blomqvist*'s Abstract describes:

A method for activating a location-based function, at least one item of position data is determined for the function as a condition for activating the function. A device in a wireless communication network examines at least one property of the network to decide whether positioning of the device (1) is conducted. Likewise, a system may provide a location-based function, for which at least one

item of position data is determined as a condition for activating the function. A program in which the method is applied is also provided.

(Ex-1033, Abstract.) (*See also* my discussions above in §VIII.E.)

231. Similar to *Hunzinger* (discussed above for claim 1), *Blomqvist* describes understood and conventional mobile device functions/aspects of automatically activating a location-based function when the device is at or within vicinity of a specified location (e.g., reminder, picture/text/sound message, application, etc. location-based functions):

The present invention relates to a method for ***activating a location-based function, in which at least one item of position data is determined for the function as a condition for activating the function***, the device being used in a wireless communication network in which signals are transmitted. The invention also relates to a system comprising determination means for determining a location-based function, ***in which at least one item of position data is determined for the function as a condition for activating the function***, processing means for ***activating the location-based function in a device***, and a wireless communication network comprising at least one transmitter for transmission of signals. Moreover, the invention relates to ***a device comprising determination***

means for determining a location-based function, in which at least one item of position data is determined for the function as a condition for activating the function, processing means for *activating the location-based function in a device*, and wireless communication means for setting up a data network connection to a wireless communication network. The invention also relates to *a program containing a group of machine-executable program commands for presenting messages in a device, and at least one location-based condition for presenting the message is determined in the message, said program being intended to be executed in a device* used in a communication network in which signals are transmitted.

(Ex-1033, 1:14-39.)

232. *Blomqvist* also explains:

Several applications have been developed that contain a location-based condition determined for a message for the presentation of the message. Such messages are for example regional *advertisements that can be transmitted to a device carried by the user, and when the user arrives to a certain location, for example in the vicinity of a store, a restaurant, a service station, or the like, this is indicated in the device of the user.* The person in question may have determined *conditions for presenting different*

messages in his or her device, wherein when he or she approaches a location in relation to which he or she has determined a message to be presented, said message is presented in the device. The person may determine for example a reminder to visit a certain hardware store, wherein when the user approaches said hardware store, this is indicated in the device of the user.

(*Id.*, 1:43-58.)

233. *Blomqvist* thus describes features that determine the position (location) of a mobile device 1 where the device can automatically activate a location-based function when it is determined the device is at or within vicinity of a specified location. (*Id.*, FIG. 2 (annotated below), 1:14-39, 2:20-62, 5:10-60.)

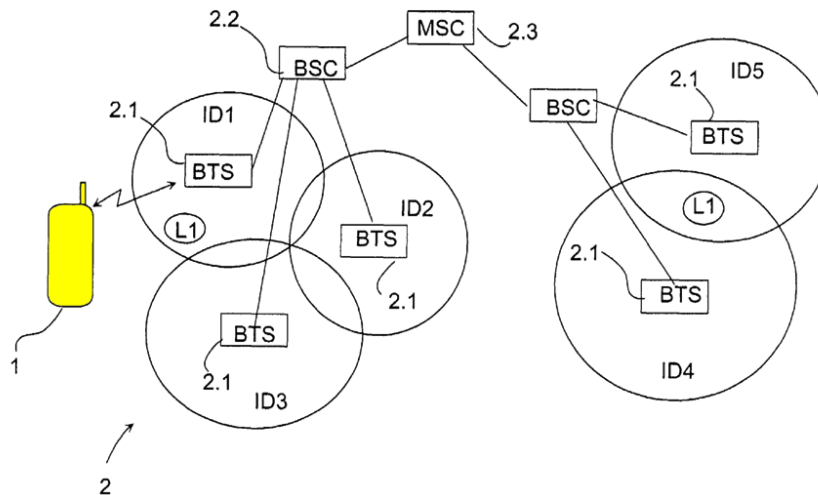


Fig. 2

234. For example, *Blomqvist* explains:

After the location of the device 1 has been determined, it is examined *whether the device 1 is in the vicinity of a location complying with a stored function performance condition*. This is implemented in the device 1 advantageously in such a manner that the location coordinates and possible distance information, such as the radius, are examined in the function information stored in the memory 1.1. *If the determined location is in the area determined by a performance condition of the function, the necessary measures are taken to perform the function*. This can be advantageously implemented in such a manner that a so-called *reminder service library implementing the reminder service as well as an application that utilizes the reminder service library to perform a function*, for example to present a reminder in text format for the user are established in the device 1.

(*Id.*, 5:10-25.)

Thus, *the application calls for such a function in the reminder service library* by means of which the application can determine the location in which *the reminder service library will provide the application with information on the arrival in the determined location*. *When the application has received information on the arrival in the determined location, the application*

implements the determined function, for example presents a message in text format. Thus, said text is formed on the display 1.6. Similarly, if the message in question is another visual message, this message is formed on the display 1.6. Furthermore, if the message in question is a sound message, this sound message is transmitted to a speaker/earpiece 1.7.

(*Id.*, 5:25-37.) (See also *id.*, 5:38-45.)

235. Further, *Blomqvist* discloses that:

Other functions to be mentioned in this context that can be activated on the basis of the location are starting of a program, changing the settings of a device, for example changing the user profile in a mobile station, re-configuration, or a security function. The user for example wishes to silence his or her mobile station when arriving to a certain location, turn off the mobile station for example when arriving to an airport, etc. It should be evident that *the afore-described details only represent some possible examples, but the invention can also be applied in implementing numerous other functions on the basis of the location*. Furthermore, the invention can be applied to implement various services. Non-restrictive examples that can be mentioned in this context are informative services and security services.

(*Id.*, 5:46-60.) Thus, a person of ordinary skill in the art would have understood *Blomqvist* to disclose, among other features (*id.*, 2:23-3:12 (change in network property as condition for performing subsequent operations), 4:35-60, 6:39-64, 7:19-26, 7:43-8:5), then-conventional mobile device functionalities that involved triggering a location-based function, such as a reminder, picture/text/sound message, application, etc., when the device is at or within vicinity of a specified location (*id.*, FIGS. 1a-2, 1:14-39, 2:20-62, 3:44-64, 5:10-6:36, 8:52-62). For example, as explained above, when an “***application has received information on the arrival in the determined location, the application implements the determined function***, for example presents a message in text format.” (*Id.*, FIG. 1, 5:10-37.) *Blomqvist* further discloses or suggests that such an application is configured to run on the mobile device to, for example, issue a reminder to a user via a phone display. (*Id.*, 5:10-37, 8:33-36, 8:52-62, FIG. 3.) Furthermore, “it is obvious that [*Blomqvist*’s] invention can also be applied for activating and performing other functions” such that “it is for example possible to ***activate an application (program) installed in the device 1*** at that stage ***when the device 1 is positioned close to a predetermined location***” for indicating “that the ***user has arrived*** to a certain location, activating a map application, etc.” (*Id.*, 8:52-62; *see also id.*, 3:44-50, 5:46-50 (“starting of a program”).)

236. Upon considering *Blomqvist* within the context of the above-teachings in context of the *Spain-I-Hunzinger-Nanda* system/processes discussed above for claim 1 (which is configured to trigger various location-based actions (§IX.A.1)), it is my opinion that a person of ordinary skill in the art would have been motivated to modify the MU of the *Spain-I-Hunzinger-Nanda* system/processes (§IX.A.1) to include location-based software program applications that are launched/executed when the device is within proximity of a device-specific target location, consistent with the teachings/guidance by *Blomqvist* and *Hunzinger*. Such a modification would have predictably resulted in the MU having installed therein, one or more applications like those suggested/taught by *Blomqvist*, which would have been launched/executed upon a determination that the MU is at the device-specific target location, which would have been associated with the corresponding function to be performed by the application, consistent with features disclosed by *Hunzinger* and *Blomqvist* and with the features recited in claim 4. Integrating such applications on a mobile device would have been a suggested and logical implementation, especially considering that mobile devices at the time were already known to offer applications to assist users with various tasks and events based on their location. The guidance provided by *Blomqvist* and *Hunzinger* further reinforces the notion that incorporating such location-based software program applications into mobile

devices was a predictable and logical approach in the art. (*See* my above analysis §V.) A person with ordinary skill in the art would have been motivated to incorporate similar features into the MU of the *Spain-I-Hunzinger-Nanda* system/processes to enhance user convenience and assist with various tasks and activities. Such tasks/activities could include providing reminders, managing to-do lists, or delivering location-based applications when the user or MU is determined to be at a particular device-specific target location, which aligns with the teachings and guidance offered by *Blomqvist* and *Hunzinger*, which were understood and recognized in the art during the relevant time. (Ex-1033, 1:43-58, 5:10-37; Ex-1054, Abstract; Ex-1072, ¶0065; Ex-1073, 19:48-54; Ex-1074, 5:33-57; Ex-1075, 1:12-29; Ex-1016, 2:33-47.) Such a modification as it would have complemented the features offered by the MU in the *Spain-I-Hunzinger-Nanda* system/processes, including providing user-friendly service-based operations that enhanced service-based features addressed and envisioned by *Spain-I*. (Ex-1011, 3:8-16.)

237. The collective teachings and suggestions of *Spain-I*, *Hunzinger*, *Nanda*, and *Blomqvist* would have predictably led such a skilled person to configure the location determining processes performed by the modified system (§IX.A.1) to further include launching a location-based software application program installed on the MU to perform a designated action upon determination that the MU's monitored

location is within proximity of the device-specific target location. (§IX.A.1.) Such features would have aligned with the features taught and suggested by *Blomqvist* and *Hunzinger* and would have been consistent with the practices and understanding in the art.

238. A person of ordinary skill in the art would have possessed the requisite skills, knowledge, and rationale to configure/implement the above modifications described above. Such a skilled person would have had a reasonable expectation of success in achieving them, especially given that they would have involved use of known techniques and technologies, including programming/modifying software executed by the MU, consistent with that described by *Spain-I*, *Hunzinger*, and *Blomqvist*. (Ex-1011, 15:19-29; Ex-1033, 8:33-62; Ex-1054, 3:49-5:22.)

2. Claim 18

- a) **The portable RF communications device of claim 15 wherein the location-based action comprises launching a computer program application on the portable RF communications device.**

239. It is my opinion that *Spain-I* in view of *Hunzinger*, *Nanda*, and *Blomqvist* discloses and/or suggests this limitation for the same reasons as those I discussed above discussed for claims 4 and 15. (§§IX.B.1, IX.A.4.)

C. *Spain-I* in View of *Hunzinger*, *Nanda*, and *Tiwari* Discloses and/or Suggests the Features of Claims 5 and 19

1. Claim 5

a) The method of claim 1 wherein part (b) is performed depending on the rate of change of the user's location.

240. It is my opinion that *Spain-I* in view of *Hunzinger*, *Nanda*, and *Tiwari* discloses and/or suggests these limitations. (§§IX.A.1, VIII.C.) My above analysis for claim 1 explains how the *Spain-I-Hunzinger-Nanda* combination discloses and/or suggests performing processes that determine whether (and a resulting determination) that the MU is within proximity of a device-specific target location, consistent with that claimed. (§IX.A.1(b).) Furthermore, a person of ordinary skill in the art would have recognized (in addition to the teachings I discussed above for claim 1) that *Spain-I* describes features that consider dynamic location aspects of a mobile device. (Ex-1011, 8:27-10:27.) Likewise, upon considering *Hunzinger* for reasons explained (§IX.A.1(b)), such a skilled person would have appreciated how *Hunzinger* discloses that a mobile device may “monitor the current location periodically, whenever a significant change occurs, whenever a certain pre-programmed change occurs, whenever a call is made, a handoff occurs or any system conditions change.” (Ex-1054, 4:39-42; *id.*, 3:29-34.) And similarly how *Nanda* discloses features that consider a mobile device's movement. (Ex-1006, FIG. 1A,

3:58-4:4, 4:60-5:8.) These references collectively provide insights into the consideration of dynamic location aspects of mobile devices, which a person of ordinary skill in the art would have found insightful for understanding and implementing such location-based systems and processes described and suggested by *Spain-I-Hunzinger-Nanda*.

241. Thus, *Spain-I, Hunzinger, and Nanda* describe and suggest features that account for a mobile device's movement and changing location conditions. Consistent with such teachings, a person of ordinary skill in the art would have been aware of various ways and conditions that location-determining processes can be performed, such as those discussed by *Spain-I-Hunzinger-Nanda*. Accordingly, such a skilled person would have been motivated to consider teachings from the art when contemplating the modified *Spain-I-Hunzinger-Nanda* system/processes discussed for claim 1. (§IX.A.1.) When doing so, such a skilled person would have been motivated and had good reason to modify the above-detailed system/process such that the determining features that are discussed for limitation 1(b) above were performed based on a rate of change of the MU/user's location in view of *Tiwari*.

242. *Tiwari* discloses systems and processes related to location services for mobile devices. It includes scenarios where a mobile device can determine its location based on cellular signals. This reference is relevant to location-based

functionalities and technologies used in mobile devices, specifically concerning location determination using cellular signals:

Location determination system 102 provides a location function for mobile communication device 100. For example, location determination system 102 may receive global positioning system (GPS) signals and determine a pseudorange to one or more satellites in order to determine the location of mobile communication device 100 or provide the pseudoranges via communication system 104 to an external device that determines the location from the pseudoranges. In this example, location determination system 102 represents a GPS receiver that is integrated into mobile communication device 100.

Alternatively, location determination system 102 may resolve location information based on signals (*e.g.*, cellular signals) or information received by communication system 104. Location determination system 102 may also resolve location, for example, by a combination of information received by communication system 104 (*e.g.*, differential GPS information) along with information received through the GPS signals. However, generally, there must be specific circuitry or functions that may be periodically performed that could be selected or deselected, such that when deselected results in savings in

terms of power usage (*e.g.*, reduction in amount of battery power utilized).

(Ex-1203, 2:45-67.) *Tiwari*'s disclosure also includes features related to the dynamic adjustment of how often a location determination is performed. This adjustment is based on the rate of change of a user's location. In other words, the frequency of location determination can vary depending on how quickly the user's location is changing. (*See also* my discussions above in §VIII.C.)

243. For example, *Tiwari* explains that a mobile device that can conduct location determining operations (similar to the MU in *Spain-I*) "usually has a limited amount of power available from its battery and frequent use of the location determination technique may quickly drain the battery":

Mobile communication devices are well known and are utilized by individuals and businesses to communicate various types of information. For example, mobile communication devices may include wireless telephones, personal digital assistants, or custom communication devices that can communicate via text and/or voice or other information over a wireless communication link. These mobile communication devices may also include location determination techniques, such as for example via their cellular network or by utilizing satellite signals (*e.g.*, global positioning system (GPS) satellites).

The location determination technique that is incorporated into the mobile communication device allows for a variety of potential location-based applications. However, **the mobile communication device usually has a limited amount of power available from its battery and frequent use of the location determination technique may quickly drain the battery.** A conventional mobile communication device generally requires its user to monitor battery life and determine when to disable the location determination function to conserve battery life. This approach places the burden on the user and may result in poor power management. As a result, **there is a need for systems and methods for providing power management for a mobile communication device utilizing a location determination technique.**

(Ex-1203, 1:13-36.) *Tiwari* describes configurations aimed at making location determining processes more efficient. These configurations involve the mobile device monitoring its current state, which can be categorized as either stopped, moving, or in a slow-moving state. By detecting and categorizing its state, the device can adjust its location determination processes to optimize efficiency. This allows the system to make more informed decisions about when and how often to perform location determinations. (*Id.*, 3:30-4:50, FIG. 2.) For instance, “if mobile

communication device 100 is in slow moving state 208, the **location determination function may be performed at a lower frequency** relative to when mobile communication device 100 is in moving state 206, **because the location of mobile communication device 100 is changing at a slower rate**”:

For example, if mobile communication device 100 is in stopped state 204, the location determination function may be performed at a much lower frequency relative to when mobile communication device 100 is in slow moving state 208. Similarly, if mobile communication device 100 is in slow moving state 208, the location determination function may be performed at a lower frequency relative to when mobile communication device 100 is in moving state 206, because the location of mobile communication device 100 is changing at a slower rate.

(Ex-1203, 4:15-24.) The location determination frequency (*e.g.*, “one minute, thirty seconds, 5 seconds,” etc.) may be based on the velocity of the user:

Consequently, the location determination function may be performed, for example, at a first rate, a second rate, and a third rate, depending upon whether mobile communication device 100 is in stopped state 204, slow moving state 208, or moving state 206, respectively. As an example, **the first rate, the second rate, and the third rate may be set to one minute, thirty seconds, and 5**

seconds, respectively. Thus, if mobile communication device 100 is in stopped state 204, then for example a GPS fix will occur every minute. However, if mobile communication device 100 is in slow moving state 208 or moving state 206, then for example a GPS fix will occur every thirty seconds or every five seconds, respectively. Thus, by monitoring the states of mobile communication device 100, battery power may be conserved and needless location determinations may be avoided, while maintaining adequate tracking or location determination of mobile communication device 100.

(*Id.*, 4:34-5:14.) Such features are similar to those described in the '811 patent:

After the cell phone records the desired location coordinates (the combination of signal strengths from surrounding cells), the cell phone will check its location as reflected by the signal strengths from surrounding cells at specific time intervals (every 2 minutes for example) or at specific times (every 5 minutes during the day and every 15 minutes between 3 am and 6 am) or depending on the rate the user's location changes (if the user does not change its location for more than 60 minutes then the rate of checking the location can be reduced from every 5 minutes to every 20 minutes to save battery power) or at the occurrence of an event (such as the cell phone switching

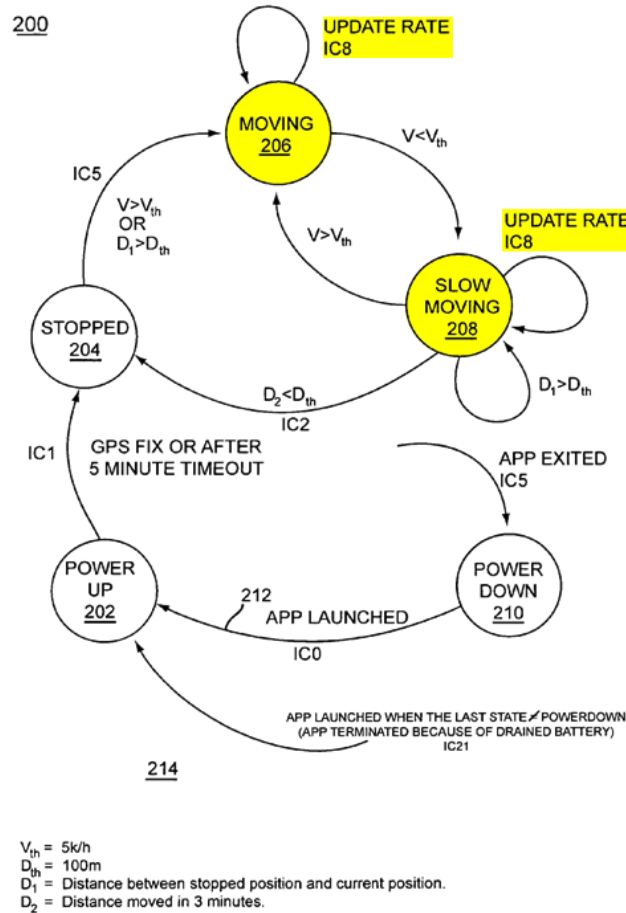
the base station it is registered with) or upon a request from the network to do so or upon a request from an application to do so or upon a request from the user to do so etc.

(Ex-1001, 19:20-34.)

244. “By monitoring the state of the device (*e.g.*, stopped, slow moving, or moving),” *Tiwari* discloses that “it can be determined how often a location determination should be performed to provide adequate tracking and monitoring of mobile communication device 100.” (*Id.*, 4:25-50.) In this fashion, “battery power may be conserved by preventing unnecessary location determinations, such as when mobile communication device 100 is stopped or moving slowly” based on the rate of change of a user’s location:

By monitoring the state of mobile communication device 100 (*e.g.*, stopped, slow moving, or moving), it can be determined how often a location determination should be performed to provide adequate tracking and monitoring of mobile communication device 100. Furthermore, by adjusting the frequency of the location determination function, battery power may be conserved by preventing unnecessary location determinations, such as when mobile communication device 100 is stopped or moving slowly.

(*Id.*; *id.*, 6:48-61, FIG. 2 (below).)



245. Like *Spain-I-Hunzinger-Nanda*, *Tiwari* discloses technologies/techniques in the same technical field as the '811 patent and that were reasonably pertinent to particular problem(s) addressed by the '811 patent (and a person of ordinary skill in the art). (Ex-1001, Abstract, 1:23-10:40; §IX.A.1; Ex-1203, FIG. 2, 1:13-36, 3:30-4:50.) Accordingly, it is my opinion that such a skilled person had reasons to consider *Tiwari* in context of *Spain-I-Hunzinger-Nanda*.

246. Upon considering *Tiwari*, a person of ordinary skill in the art would have been motivated to modify *Spain-I* system/processes and its MU to its proximity

determination process as I discussed above in §IX.A.1(b) depending on the rate of change of the user's location, which is similar to the features described and suggested by *Tiwari*. A person of ordinary skill in the art would have recognized the advantages of implementing such a modification, such as programming or configuring the MU to monitor and detect its state (*e.g.*, stopped, moving slowly) to control location determination operations. This modification would have predictably lead to improved power efficiency, reduced battery drain, and enhanced location determination accuracy, which align with the teachings and guidance provided by *Tiwari* and were understood and accepted in the art. (Ex-1203, 4:25-50, 6:48-61, 2:56-67; Ex-1204, ¶¶0026-27.) Such advantages would have led such a skilled person to consider and implement similar features that predictably resulted in the MU perform determining operations (§IX.A.1(b)) based on a rate of change of the MU/user's location, like that recited in claim 5.

247. A person with ordinary skill in the art would have possessed the necessary skills, knowledge, and rationale to configure and implement the described modifications. Such a skilled person would have had a reasonable expectation of success in achieving these modifications, particularly because they involve known techniques and technologies that are in line with the practices and principles described by *Spain-I* and *Tiwari*. The configuration would have contributed to

enhancing the efficiency and effectiveness of location determination processes in mobile devices as understood in the art. (Ex-1011, 15:19-29; Ex-1203, 6:10-24).

2. Claim 19

- a) The portable RF communications device of claim 15 wherein part (b) is performed depending on the rate of change of the user's location.**

248. It is my opinion that *Spain-I* in view of *Nanda* and *Tiwari* discloses and/or suggests this limitation for the same reasons I discussed for claims 5 and 15. (§§IX.A.4, IX.C.1.)

D. *Spain-I* in View of *Hunzinger*, *Nanda*, and *Othmer* Discloses and/or Suggests the Features of Claim 24

1. Claim 24

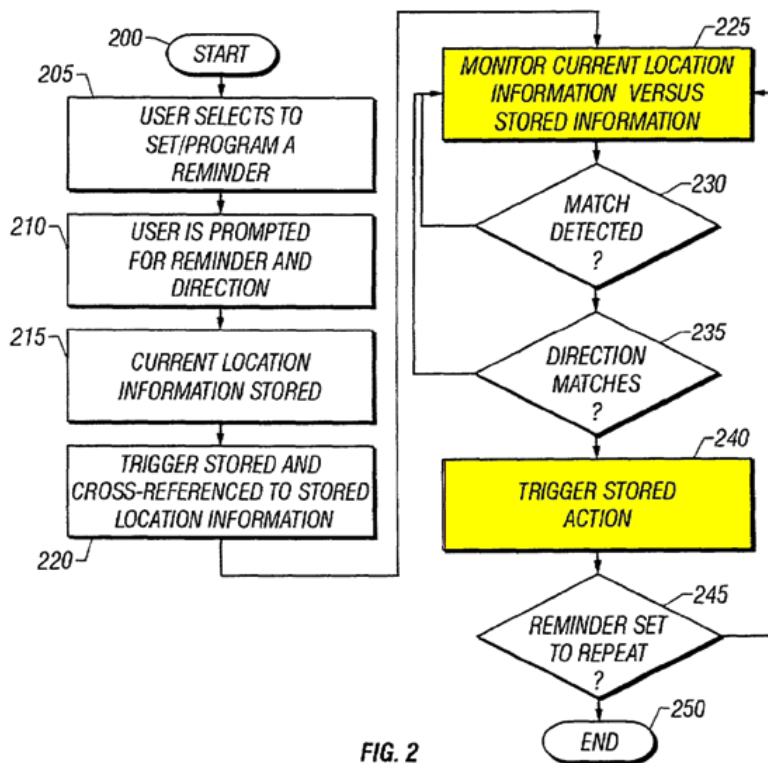
- a) The portable RF communications device of claim 15 wherein the device-specific target location is a shop and the location-based action relates to a coupon redeemable at the shop.**

249. It is my opinion that *Spain-I* in view of *Hunzinger*, *Nanda*, and *Othmer* discloses and/or suggests these limitations. (§§IX.A.4, VIII.D.) My above analysis for claim 1 explains how the *Spain-I-Hunzinger-Nanda* combination discloses and/or suggests determining if the MU is within proximity of a device-specific target location, like that claimed. (§IX.A.1(b).) Furthermore, the MU in the modified system/process would have been configured to take a location-based action when such proximity is determined, consistent with that taught by *Hunzinger* and that

discussed for limitation 1(c). (§IX.A.1(c); *see also* my discussions in §IX.A.1(b); Ex-1054, FIGS. 2 (below), 3-4, 3:61-66, 4:60-5:40.) A person of ordinary skill in the art would have understood that *Spain-I* does not limit the type of locations that the MU may be positioned at or the type of locations that are monitored by the system. (Ex-1011.) Moreover, *Hunzinger* discloses, among other applications, that a device-specific target location may be a grocery store (“**shop**”):

The present invention provides a system that allows users of wireless mobile terminals to set reminders, alerts, or other **actions to be triggered based on location** or dynamics. Consider for example, that a user of a wireless handset realizes that **he or she wants to pick up some groceries on the way home as he or she passes a grocery store on the way to work**. Using the present invention, the **user can command the terminal to set a reminder in the form of, for example, a voice memo “buy groceries”**. The user may then select that this reminder be played back upon re-entering the current general location.

(Ex-1054, 2:11-19, FIGS. 2 (below), 3, 3:61-66, 4:60-5:40; §§IX.A.1(b)-(c), IX.A.4(a).)



(Ex-1054, FIG. 2 (annotated).)

250. Thus, the *Spain-I-Hunzinger-Nanda* combination discloses/suggests such features, including triggering user selectable location-based actions based on determined locations and related store actions as I mentioned above (§IX.A.1(c)). When considering such location-based applications (including store-based actions), a person of ordinary skill in the art would have been aware of and appreciated the advantages of systems and methods for delivering promotional or advertisement materials based on location in wireless network environments before the alleged time of invention. A few examples are illustrative of this point. For example,

Hendrey details that before the alleged time of invention it was “possible for merchants to deliver advertisements to portable devices that happen to be located in a particular geographic area at a particular time.” (Ex-1205, 1:13-26; Ex-1206, Abstract (location-based advertising delivery), ¶¶0005, 0050.) As another example, *Kullman* detailed sending and advertisement “or coupon” upon knowing that a device “is operating in a particular location.” (Ex-1207, 2:11-29.) Such features were well-understood before the alleged time of invention. Thus, and as a predictable and understood application of such technologies, a person of ordinary skill in the art would have been motivated and had good reason to implement such features in light of *Othmer*, including where the location-based action relates to a coupon redeemable at shop.

251. Consistent with such knowledge, and with *Spain-I-Hunzinger-Nanda*, *Othmer* discloses systems and processes related to location services for mobile devices. The reference discusses how a mobile device can detect its location based on cell site signals or other well-understood methods. (Ex-1208, Abstract, FIG. 1 (below), 1:16-22; 2:37-51, 3:8-32, 3:32-45 (“Determining a mobile device’s location is well understood in the art and can be done through a number of means....”), 7:54-8:15.)

the television news and on sports channels, providing viewers with “at-a-glance” headlines, breaking news, weather reports, sports scores and other updates.

.....

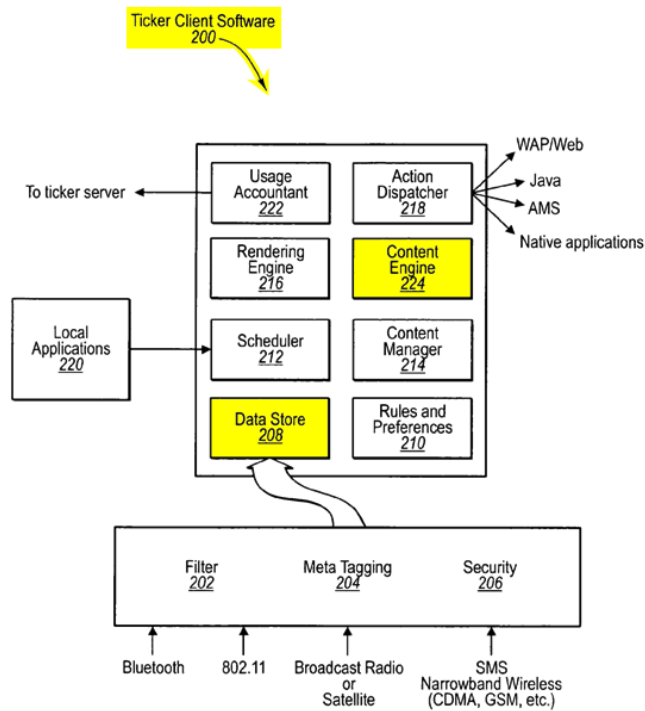
Furthermore, **tickers are beginning to appear** as a method for dynamic information display **on mobile communication devices, such as cellular telephones, personal digital assistants (PDAs), and “smart” phones.**

....

Member vendors of the location-based ticker service may register information about their products and services, including advertisements, promotional information and entertainment-related information with the location-based ticker service. In this example, Peet's Coffee, a member vendor of the location-based ticker service, could register a promotional coupon with the service, which is then transmitted to communication devices located, for instance, in a particular region such as Northern California. **The promotional coupon is associated with metadata that includes a proximity rule stating that if a user arrives at a location within a specified distance of a Peet's retail store, the information is to be**

displayed on the ticker of the user's device. In this case, the Peet's promotional content may be downloaded at any time—such as during an off-peak time for network traffic—regardless of the user's current location, and stored on the device pending display when the user reaches the location specified in the proximity rule.

(Ex-1208, 1:24-65, 3:45-63; *see also id.*, 2:36-51, 8:19-44, FIGS. 1-2.) Such a *“promotional coupon is associated with metadata that includes a proximity rule stating that if a user arrives at a location within a specified distance of a Peet’s retail store, the information is to be displayed on the ticker of the user’s device.”* (Ex-1208, 3:46-63; *see also id.*, 10:15-34 (engine periodically checking device location and matching current location with available content (such as coupons)), FIG. 2 (below), 2:36-65, 4:21-35, 8:29-9:21.)



253. *Othmer* further discloses that when the mobile device determines that its current location (such as retail store, Pete’s store, etc.) is a match for stored content (coupon), the coupon is displayed to the user. (*Id.*, 14:50-15:26, 2:36-65, 3:46-63, 8:29-9:21, 10:15-34.) As disclosed in this system, a coupon such as for Peet’s retail store or another store as suggested by the reference “may be...stored on the device pending display when the user reaches the location specified in the proximity rule.” (*Id.*, 3:46-63.)

254. Such technologies and techniques disclosed by *Othmer* were reasonably pertinent to particular problem(s) addressed by the ’811 patent and a person of ordinary skill in the art and in the same technical field as the ’811 patent.

(Ex-1001, Abstract, 1:23-10:40; §IX.A.1; Ex-1208, 3:46-4:21, 10:15-34, 14:50-15:26, FIG. 5.) A person of ordinary skill in the art would have had good reason to consider and consult *Othmer* in context of *Spain-I-Hunzinger-Nanda*.

255. And when doing so, a person of ordinary skill in the art would have been motivated and had good reason to modify the MU of the *Spain-I-Hunzinger-Nanda* system/processes such that it performed the above-location monitoring/determining features (§IX.A.1(a)-(c)). Such features would have been preformed in applications where the device-specific target location was a retail shop and the location-based action (§IX.A.1(c)). Moreover, such a configuration would have entailed and related to providing/displaying/etc. a coupon that the MU user could redeem at the retail shop. And such a skilled person would have appreciated implementing the feature in the MU of the modified system/process would have predictably resulted in the *Spain-I-Hunzinger-Nanda* system/process in providing and implementing known business/marketing/retail concepts/features known in the art for known benefits and advantages, like that demonstrated by *Othmer*. Providing coupons to the Mobile Unit (MU) when it is in close proximity to or at a store, as suggested by *Othmer*, would have been a natural implementation of well-known features. Mobile devices were already being designed to perform various actions based on their location, as described by *Hunzinger* and *Othmer*, and this includes

offering location-specific services such as coupons or promotions to users when they are near or inside a store. This approach aligns with the evolving capabilities and functionalities of mobile devices and is in line with the teachings and practices in the art at the time.

256. A person of ordinary skill in the art would have recognized that implementing the described modification, such as providing coupons to the Mobile Unit (MU) based on its location, would have brought several benefits to the modified system. These benefits would have included increased user convenience, as users could receive coupons for desired retail stores, improved advertisement and business reach, and the ability to maximize the effectiveness of advertising campaigns. These advantages align with the teachings and common understanding in the art, where location-based services and promotions were increasingly used to enhance the user experience and provide targeted promotional opportunities. (Ex-1208, 1:60-2:32, 12:33-45; Ex-1205, 1:34-38, Ex-1212, 1:60-2:32.) Providing such location-based coupons per my explanations above would have enhanced the service-based features contemplated by *Spain-I*. (Ex-1011, 3:8-16.)

257. A person with ordinary skill in the art would have possessed the skills, knowledge, and rationale to configure and implement the described modifications with a reasonable expectation of success. Such modifications would have involved

the use of known techniques and technologies, as described in *Spain-I*, *Hunzinger*, and *Othmer*, among others. As a result, the modified *Spain-I-Hunzinger-Nanda-Othmer* system/processes would have predictably included features and applications where the device-specific target location is a shop, and the location-based action relates to a coupon that is redeemable at the shop, as claimed in the patent. (Ex-1011, 15:19-29; Ex-1208, 14:50-15:26.) These modifications aligned with the advancements in location-based technologies and services that were commonly understood in the art at the time and I discussed above. Thus, the resulting *Spain-I-Hunzinger-Nanda-Othmer* system/processes would have predictably included features/applications where the device-specific target location was a shop and the location-based action relates to a coupon redeemable at the shop, as claimed.

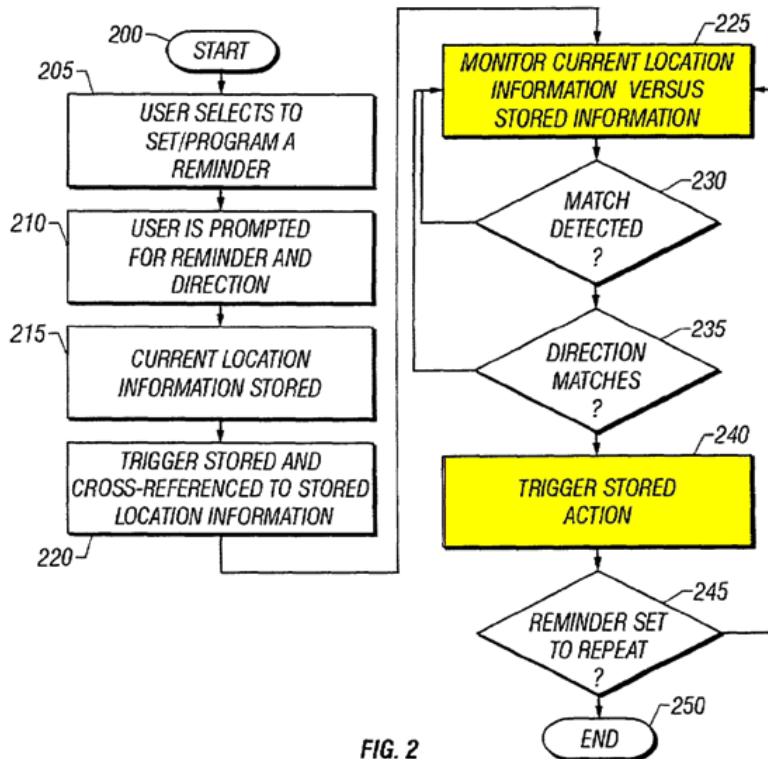
E. *Spain-I* in View of *Hunzinger*, *Nanda*, and *Bates* Discloses and/or Suggests the Features of Claim 25

1. Claim 25

- a) The portable RF communications device of claim 15 wherein the location-based action causes incoming calls on the portable RF communications device to be directed to a landline telephone within proximity of the device-specific target location.**

258. It is my opinion that *Spain-I* in view of *Hunzinger*, *Nanda*, and *Bates* discloses/suggests these limitations. (§§IX.A.1, IX.A.4, VIII.G) My above analysis for claims 1 and 15 explains how the *Spain-I-Hunzinger-Nanda* combination

discloses and/or suggests determining if the MU is within proximity of a device-specific target location, like that claimed. (§§IX.A.1(b), IX.A.4.) Furthermore, the MU in the modified system/process would have been configured to take a location-based action when such proximity is determined, consistent with that taught by *Hunzinger* and that discussed for limitation 1(c). (§§IX.A.1(c), IX.A.4(a); Ex-1054, FIG. 2 (below), 3, 3:61-66, 5:29-34, 4:60-5:40.)



259. The *Spain-I-Hunzinger-Nanda* combination discloses/suggests such features, including triggering user selectable location-based actions based on determined locations as I mentioned above (§IX.A.1(c)). When considering such location-based applications, a person with ordinary skill in the art would have been

well aware of location-based call-forwarding actions and would have appreciated their benefits. Such features and systems involved routing incoming calls to a different phone number or destination based on the physical location of a mobile device, and were widely used to improve communication and manage calls efficiently, as evidenced by the below examples:

A method of forwarding calls directed to a cellular phone to a target phone number based on time-based and location-based trigger events. A call forward profile associated with the cellular phone is defined and stored in memory in the cellular phone, wherein the profile includes call forward criteria and the target phone number. Call forward criteria includes time-based and location-based trigger events. Thereafter, the cellular phone periodically determines the current time and its location and, if the cellular phone determines that the time-based and location-based trigger events for a particular profile are both satisfied, the cellular phone notifies the cellular provider associated with the phone to forward later-received calls to the target number using the cellular provider's own activation and deactivation codes. Notification by the cellular phone to the cellular provider may be set to automatic or only after a prompt to the cellular phone user.

(Ex-1209, Abstract; *see generally* Ex-1209).)

Call forwarding data, including forward to numbers for a particular mobile station are correlated with a particular service area and stored at a home location register (HLR) associated with that particular mobile station. Whenever the mobile station travels into a mobile switching center (MSC) serving that particular service area, the MSC performs a location update with the HLR. A location update signal further includes data representing the identity of the service area currently serving the mobile station. Upon receiving the location update signal from the serving MSC, the HLR analyzes the received data to determine the identity of the service area currently serving the mobile station and retrieves the call forwarding data associated with that particular service area. The retrieved call forwarding data are then analyzed to **determine whether the forward to numbers are located in the current service area for the mobile station and, if so, transmitted back to the serving MSC in order to provide location-based call forwarding to the roaming mobile station.**

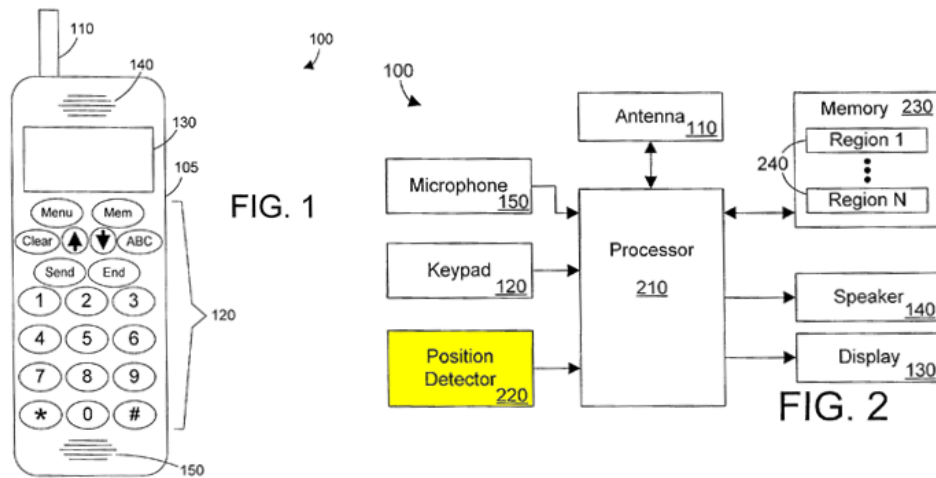
(Ex-1210, Abstract; *id.*, Title (“location-based call forwarding”); *see generally* Ex-1210.)

A method of and system for processing a telephone call to a wireless telephone number associated with a mobile telephone unit forwards the call to a registered wireline number if the mobile unit is located near the geographic location associated with the wireline number. In response to a call placed to a wireless telephone number, the system determines the geographic location of the mobile unit associated with the wireless telephone number. If the mobile unit is near a registered location, the system forwards the call to the registered wireline number associated with the registered location.

(Ex-1211, Abstract; *see generally* Ex-1211.) Such features were well-understood before the alleged time of invention. Thus, and as a predictable and understood application of such technologies, a person of ordinary skill in the art would have been motivated and had good reason to implement such features in light of *Bates*, including where the location-based action causes incoming calls on the portable RF communications device to be directed to a landline telephone within proximity of the device-specific target location.

260. Similar to *Spain-I-Hunzinger-Nanda*, *Bates* discloses a similar system and process relating to location services for mobile devices. (Ex-1212, Abstract, FIGS. 1-2, 13, ¶¶0003-0007.) *Bates*, similar to the systems and processes described

by *Spain-I* and others, discloses features where a mobile device may determine its location. (Ex-1212, FIGS. 1-2 (below), ¶0034.) Position detector element 220 may be used for the location determination processes.



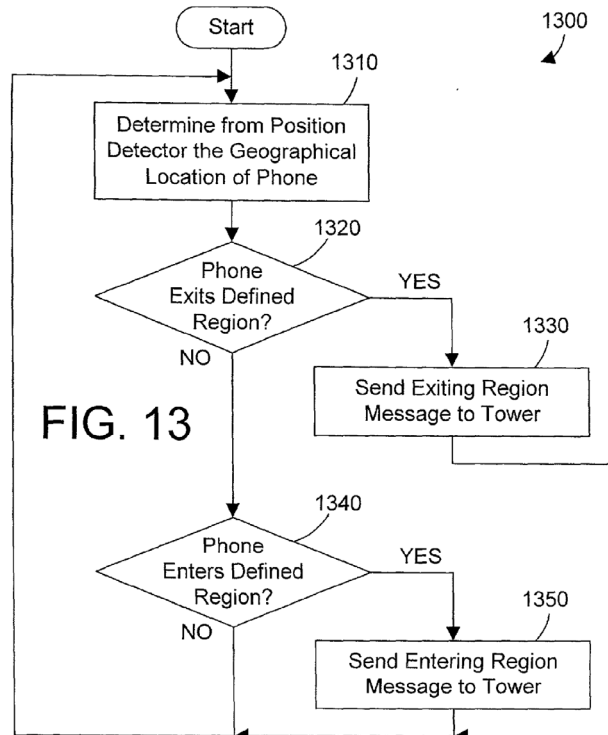
261. *Bates* noted that “[m]odern life” made it “desirable for the location of a portable phone to affect how other land-based phones or other portable phones function”:

Known portable phones are like land-based phones in the respect that they ring when the number that is assigned to the portable phone receives a call. Portable phones currently cannot affect the function of other portable phones or of land-based phones. **Modern life makes it desirable for the location of a portable phone to affect how other land-based phones or other portable phones function.** For example, when a user of a portable phone

takes the phone home, it may be desirable for a call to the portable phone to ring the user's home phone instead, thereby avoiding wireless charges during the call. Without a way for a portable phone to change the function of other phones based on its geographical position, the power of using portable phones will not fully be realized.

(*Id.*, ¶0006; *id.* ¶0005.) “For example, when a user of a portable phone takes the phone home, it may be *desirable for a call to the portable phone to ring the user's home phone instead*, thereby avoiding wireless charges during the call.” (*Id.*, ¶0006) And “[w]ithout **a way for a portable phone to change the function of other phones based on its geographical position,**” *Bates* discloses that “the power of using portable phones [would] not fully be realized.” (*Id.*)

262. *Bates* further discloses capabilities in which a mobile device is configured to determine its location and transmit information to a remote destination upon entering or leaving specific locations or regions, similar to that described by *Spain-I*, *Hunzinger*, and others. (Ex-1212, FIG. 13 (below), ¶¶0022, 0048.)



263. The remote location (call tower) determines how to forward phone calls based on the received location information and maintained phone parameters:

Referring to FIG. 14, a method 1400 represents the function of a telephone company network that receives the exiting region and entering region messages from method 1300 in FIG. 13. The call router (*e.g.*, 750 of FIGS. 7, 9 and 11) maintains phone parameters for the named regions according to the entering region and exiting region messages received from the portable phone (step 1410). For the simple example of FIGS. 7-12, the call router simply looks to the current number list for the region to determine which phones to ring when a call is received on the home or work numbers. If the portable phone is listed

as a current number, it will ring in addition to ringing the land-based phone that corresponds to the dialed number.

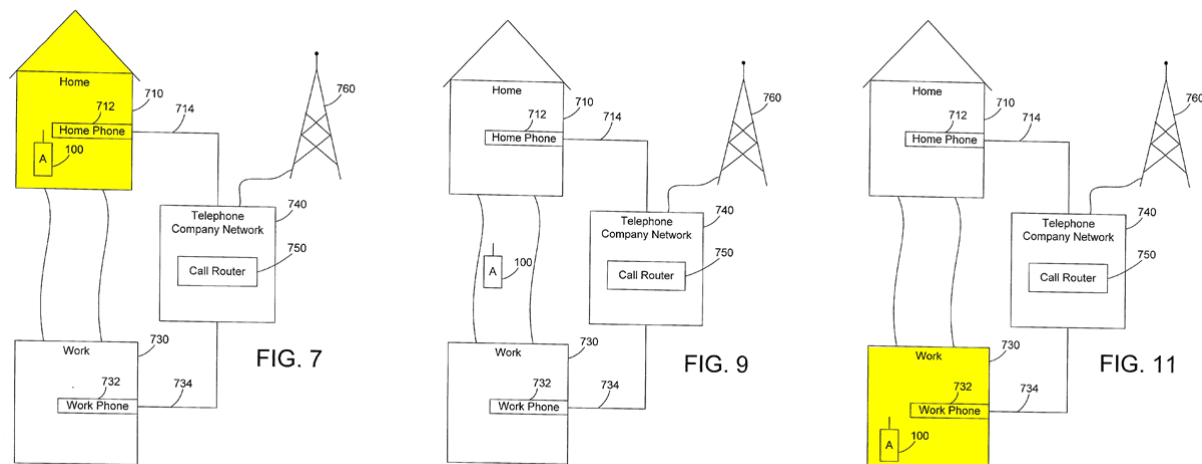
(*Id.*, ¶0049.) “For example, when the portable phone 100 is at home 710, the call router 750 could **route calls to the portable phone 100 to the home phone 712 without the portable phone 100 ringing, ...**”, etc.:

Suitable phone parameters 800 for the example of FIG. 7 are shown in FIG. 8. We assume for this simple example that a region is defined that corresponds to the architect's home 710, and a separate region is defined that corresponds to the architect's office 730. Phone parameters 800 shown that each defined region has a list of allowed phone numbers that are allowed to be affected by the presence or absence of portable phone 100 within a region. Each region also has a list of current phone numbers whose operation may be affected by the presence or absence of portable phone 100 within a region. For the simple example in FIGS. 7 and 8, we assume the following: portable phone 100 has a telephone number of 855-1234; home phone 712 has a telephone number of 555-0011; and work phone 732 has a telephone number of 555-2233. The entry in phone parameters 800 for home indicates that both the home phone number and the portable phone number are allowed numbers, and that both of these are current numbers, because the portable phone

is at home. For this specific example, we assume when the portable phone is at home 710 that a call to either the home phone 710 or the portable phone 100 will cause the call router 750 to ring both phones 712 and 100, and the call router 750 will then connect the call to whichever phone is answered first. Of course, other variations are also possible within the scope of the preferred embodiments. **For example, when the portable phone 100 is at home 710, the call router 750 could route calls to the portable phone 100 to the home phone 712 without the portable phone 100 ringing, while the call router routes calls to the home phone 712 only to the home phone, and not to the portable phone 100.** These types of variations could be easily programmed into the phone parameters that dictate the function of the portable phone and other phones according to the self-detected geographical position of the portable phone.

(*Id.*, ¶0044; *id.*, ¶0043 (“home phone 712 that is a land-based phone...as is known in the art”).) “Other variations” (*e.g.*, forwarding portable phone calls to a “land-based” work phone) were also envisioned and could be “easily programmed into the phone parameters that dictate the function of the portable phone and other phones according to the self-detected geographical position of the portable phone.” (*Id.*, ¶¶0042-0044, FIGS. 7, 9, 11.)

264. *Bates* also reveals potential attributes where the landline telephone is in close proximity to a device-specific target location, such as the portable phone being near the landline's location, like at home (710) or work (730), when activating call forwarding. This enables the user to answer calls on the local landline. (*Id.*, FIGS. 7, 9, 13, ¶¶0042 (“ring a single phone...when a portable phone is within or outside of a defined region”), ¶¶0043-0044; *id.*, FIGS. 4-6, 13, ¶¶0036-0042.) Below, in Figures 7, 9, and 11, you can see visual representations of the exemplary setups envisioned by *Bates*. These configurations demonstrate scenarios in which a portable phone is positioned in close proximity to a specific target location and forwards calls to a landline at the same location, be it at home or work. (*Id.*, FIGS. 7, 9, 13, ¶¶0042-44.)



265. Accordingly, *Bates* discloses technologies/techniques that were reasonably pertinent to problem(s) addressed by the '811 patent (and a person of

ordinary skill in the art) and is in the same technical field as the '811 patent. (Ex-1001, Abstract, 1:23-10:40; §IX.A.1; Ex-1212, FIGS. 7-13, ¶¶0044-47.) A person with ordinary skill in the art would have had reason to consider or account for *Bates* and its disclosures within the context of *Spain-I-Hunzinger-Nanda*.

266. Upon doing so, a person of ordinary skill in the art would have been motivated to configure the MU in a manner that would have enabled a location-based action (as outlined in §IX.A.1(c) and IX.A.4) to trigger incoming calls on the MU to be directed to a landline telephone within proximity of the device-specific target location, similar to that described by *Bates*. Such a skilled person would have recognized that making such modifications would have led to the *Spain-I-Hunzinger-Nanda* system or processes gaining the advantage of delivering or implementing call forwarding capabilities that were well-known in the art, similar to those exemplified by *Bates*. Thus, implementing features like those suggested by *Bates* would have been a suggested application of known features, given mobile devices were being designed to perform a variety of actions based on location as described by *Hunzinger* and *Bates*. (See my above analysis §V.)

267. It is my opinion that a person of ordinary skill in the art would have been motivated and had good reason to include such features in the *Spain-I-Hunzinger-Nanda* system considering the desire to redirect mobile calls to landlines

based on location, enhance user convenience, fully harness the potential of portable phones, and enhance the user-friendliness of the telephone system, while also reducing wireless call expenses, conserving mobile device power, and attaining other sought-after advantages, which align with the insights and recommendations provided by *Bates* and comprehended within the art. (Ex-1212, ¶¶0006-0007, 0057; Ex-1209, ¶¶0009-13; Ex-1210, 1:55-64; Ex-1211, 2:23-34.) Indeed, a person of ordinary skill in the art also would have likewise recognized the advantages of implementing such a modification, as it would have synergized with and enhanced the features provided by the Mobile Unit (MU) in the *Spain-I-Hunzinger-Nanda* system or processes, as well as the service-related features envisioned in *Spain-I*. (Ex-1011, 3:8-16.)

268. A person possessing ordinary skill in the art would have had the necessary skills, knowledge, and reasoning to set up and execute the aforementioned modifications, with a reasonable expectation of success in realizing the intended outcomes. This is particularly true as these modifications would have entailed the utilization of established location-based function techniques and technologies (consistent with my earlier analysis, §V), which could include programming or modifying software executed by the Mobile Unit (MU), in a manner consistent with the descriptions provided in *Spain-I* and *Bates*. (Ex-1011, 15:19-29; Ex-1212,

¶0057, FIG. 13.) The collective teachings/suggestions of *Spain-I-Hunzinger-Nanda-Bates* would have predictably led such a skilled person to configure the MU to forward incoming calls on the portable RF communications device to a landline telephone within proximity of a target location as suggested by *Bates* and understood in the art and like that claimed.

X. CONCLUSION

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

Dated: November 7, 2023



Kevin C. Almeroth