

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. 8,170,583

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 8,170,583**

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Ex-1005	U.S. Patent No. 6,269,246 (“ <i>Rao-I</i> ”)
Ex-1006	U.S. Patent No. 8,477,731 (“ <i>Nanda</i> ”)
Ex-1007	U.S. Patent Application Publication 2001/0022558 (“ <i>Karr</i> ”)
Ex-1008	U.S. Patent No. 7,116,987 (“ <i>Spain-II</i> ”)
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Ex-1010	U.S. Patent No. 6,393,294 (“ <i>Perez-Breva-I</i> ”)
Ex-1011	U.S. Patent No. 6,944,465 (“ <i>Spain-I</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 (“ <i>Phillips</i> ”)
Ex-1017	U.S. Patent No. 7,213,057 (“ <i>Trethewey</i> ”)

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Ex-1018	U.S. Patent Application Publication No. 2004/0203768 (“ <i>Ylitalo</i> ”)
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Ex-1032	U.S. Patent No. 7,397,424 (“ <i>Houri</i> ”)
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Ex-1053	U.S. Patent Application Publication No. 2005/0159174 (“ <i>Bar-On</i> ”)
Ex-1054	U.S. Patent No. 6,957,076 (“ <i>Hunzinger</i> ”)
Ex-1055	U.S. Patent No. 7,263,441 (“ <i>Janky</i> ”)
Ex-1056	U.S. Patent Application Publication No. 2005/0136845 (“ <i>Masuoka</i> ”)
Ex-1057	U.S. Patent Application Publication No. 2004/0198386 (“ <i>Dupray</i> ”)
Ex-1058	U.S. Patent Application Publication No. 2005/0282557 (“ <i>Mikko</i> ”)
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Ex-1066	U.S. Patent Application Publication No. 2006/0095349 (“ <i>Morgan-II</i> ”)
Ex-1067	U.S. Patent No. 6,915,123 (“ <i>Daudelin</i> ”)
Ex-1068	U.S. Patent Application Publication No. 2007/0010956 (“ <i>Nerguizian</i> ”)
Ex-1069	U.S. Patent Application Publication No. 2005/0195761 (“ <i>Alicherry</i> ”)
Ex-1070	U.S. Patent Application Publication No. 2007/0133487 (“ <i>Wang</i> ”)
Ex-1071	U.S. Patent Application Publication No. 2006/0089153 (“ <i>Sheynblat-II</i> ”)

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Ex-1072	U.S. Patent Application Publication No. 2007/0249365 (“ <i>Jendbro</i> ”)
Ex-1073	U.S. Patent No. 7,941,656 (“ <i>Hans</i> ”)
Ex-1074	U.S. Patent No. 7,454,608 (“ <i>Gopalakrishnan</i> ”)
Ex-1075	U.S. Patent No. 8,948,785 (“ <i>Grindeland</i> ”)
Ex-1076	U.S. Patent No. 8,725,406 (“ <i>Kitajima</i> ”)

I. INTRODUCTION

Samsung Electronics Co., Ltd. (“Petitioner”) requests *inter partes* review of claims 1-10, 17-20, and 24-26 (“challenged claims”) of U.S. Patent No. 8,170,583 (“the ’583 patent”) (Ex-1001) assigned to Broadphone LLC (“PO”). As explained below, each challenged claim should be canceled as unpatentable.

II. MANDATORY NOTICES

Real Parties-in-Interest: Petitioner identifies the following as the real parties-in-interest: Samsung Electronics Co., Ltd., and Samsung Electronics America, Inc.

Related Matters: The ’583 patent is at issue in the following matter(s): *Broadphone LLC v. Samsung Elecs. Co., Ltd.*, No. 23-cv-00001 (E.D. Tex.) (asserting the ’583 patent and also U.S Patent Nos. 8,594,698 and 10,341,811) (“Texas Litigation”).

Petitioner has concurrently submitted petitions for *inter partes* review of challenging claims of U.S Patent Nos. 8,594,698 and 10,341,811.

Counsel and Service Information: Lead counsel: Joseph E. Palys (Reg. No. 46,508), and Backup counsel are (1) Naveen Modi (Reg. No. 46,224) and (2) Kevin Stewart (Reg. No. 78,581). Service information is Paul Hastings LLP, 2050 M St., Washington, D.C., 20036, Tel.: 202.551.1700, Fax: 202.551.1705, email: PH-

Samsung-Broadphone-IPR@paulhastings.com. Petitioner consents to electronic service.

III. PAYMENT OF FEES

The PTO is authorized to charge any fees due during this proceeding to Deposit Account No. 50-2613.

IV. GROUNDS FOR STANDING

Petitioner certifies the '583 patent is available for review and Petitioner is not barred or estopped from requesting review on the identified grounds.

V. PRECISE RELIEF REQUESTED AND GROUNDS

The challenged claims should be canceled as unpatentable based on the following grounds under pre-AIA 35 U.S.C. § 103:

Ground	Claim(s)	References
1	1-10, 26	<i>Spain-I</i> in view of <i>Hunzinger</i> and <i>Nanda</i>
2	3, 5-6	<i>Spain-I</i> in view of <i>Hunzinger</i> , <i>Nanda</i> , and <i>Damarla</i>
3	7-10	<i>Spain-I</i> in view of <i>Hunzinger</i> , <i>Nanda</i> , and <i>Houri</i>
4	17-20, 24-25	<i>Spain-I</i> in view of <i>Hunzinger</i> , <i>Nanda</i> , and <i>Blomqvist</i>

The '583 patent issued from an application filed 9/19/2006, which Petitioner assumes (without conceding such entitlement) is the effective date of the '583 patent.

Spain-I was filed 11/18/2002,¹ *Nanda* was filed 2/15/2006, *Damarla* was filed 7/29/2004, *Houri* was filed 6/29/2005, *Blomqvist* was filed 1/21/2004, and *Hunzinger* was filed 11/15/2001, and thus each qualifies as prior art at least under 35 U.S.C. § 102(e). None were substantively considered during prosecution. (Ex-1004; §X.)

VI. LEVEL OF ORDINARY SKILL

A person of ordinary skill in the art as of the assumed date of the '583 patent ("POSITA") would have had at least a BS degree in computer science, electrical engineering, or 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). (Ex-1002, ¶¶31-32.)² More education can supplement practical experience and vice versa. (*Id.*)

VII. THE '583 PATENT

The '583 patent describes systems/methods for determining a location for a portable device. (Ex-1001, Abstract, 6:18-31, 18:3-55, 24:13-42.) In one aspect, the

¹ *Spain-I* (Ex-1011) incorporates by reference disclosures of Exhibits 1005, 1009-1010, 1012-1015. (Ex-1011, Cover, 1:5-14, 15:1-16).

² Petitioner submits the declaration of Kevin Almeroth, Ph.D (Ex-1002), an expert in the field of the '583 patent. (Ex-1002, ¶¶1-30; Ex-1003.)

device compares current location signal strengths with desired location signal strengths, which are respectively stored in unique radio frequency snapshots referred to as “fingerprints.” (*Id.*, 17:35-49, 18:48-19:7, 16:40-48.) If they match, the “cell phone is determined to have returned to the desired location (i.e., current location=desired location).” (*Id.*, 19:8-60.) During prosecution, the applicant equated the alleged “key” location proximity aspects of “part (b) of Claim 1” with “*determining if the user has reached the desired location or has left the desired location.*” (Ex-1004, 100.)³ However, the use of fingerprints/signal characteristics to determine whether a mobile device is “*at a particular location or not*” and other related features was known. (Ex-1011, 4:23-25; §IX; *see also* Ex-1002, ¶¶33-58, 63-93; Exs-1008, 1018, 1056-1060, 1063-1076.) This includes the “threshold” features added during prosecution that led to allowance of the ’583 patent. (Ex-1004, 20-27, 42-45, 86-98; §IX.A.1(b)(ii)(2); Ex-1002, ¶¶148-176.)

VIII. CLAIM CONSTRUCTION

For purposes of this proceeding, no special constructions are necessary to assess whether the challenged claims are unpatentable, and thus Petitioner applies their plain meanings—including in context of specification and file history

³ Emphasis added unless stated otherwise.

representations.⁴ *Toyota Motor Corp. v. Cellport Systems, Inc.*, IPR2015-00633, Paper No. 11 at 16 (Aug. 14, 2015). (Ex-1002, ¶¶59-62; §IX.)

IX. DETAILED EXPLANATION OF GROUNDS⁵

A. Ground 1: Claims 1-10 and 26 are obvious over *Spain-I* in view of *Hunzinger* and *Nanda*

1. Claim 1

[pre] A signal-comparison based location-determining method, operable by a first portable RF communications device in conjunction with a plurality of fixed-location service-area antenna stations capable of RF communication with the first portable RF communications device wherein the antenna stations are substantially continuously operating, the method comprising:

To the extent limiting, *Spain-I* ⁶ (including as modified below) discloses/suggests these limitations. (Ex-1002, ¶¶94-103; §§IX.A.1(a)-(b).)

⁴ Petitioner reserves all rights to raise claim construction and other arguments (§112, etc.) in other proceedings. *See, e.g., Target Corp. v. Proxicom Wireless, LLC*, IPR2020-00904, Paper 11 at 11-13 (Nov. 10, 2020).

⁵ References to prior art other than that asserted in each ground demonstrate the state of art.

⁶ *See supra* n.1.

Spain-I discloses a mobile unit (MU) that works in conjunction with antenna stations capable of RF communication with the MU, and is operable to perform location-determining based on signal characteristic comparison process(es). (Ex-1011, 3:35-41, FIGS. 1-2 (annotated below), 9-10, 1:18-49, 3:5-4:63, 5:20-6:34, 7:58-8:44, 9:25-14:37, 15:19-35; Ex-1005, FIGS. 1-2, 4-5, Abstract, 1:26-3:9, 3:29-61, 4:59-63, 5:40-56; Ex-1010, 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, 7:4-11:17; Ex-1002, ¶¶63-69, 97.)

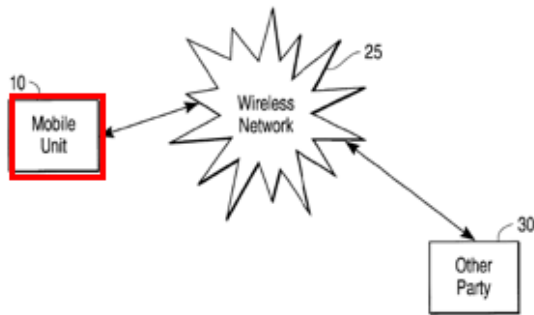


FIG. 1

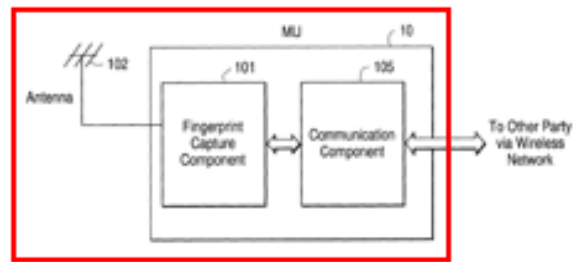


FIG. 2

At selected location(s), the MU collects/measures identifier information (*e.g.*, station ID)/signal strengths for signals received from stations capable of RF communications with the MU, and generates/stores fingerprint(s) based on that information. (Ex-1011, FIG. 9, 1:25-28, 3:42-4:63, 5:20-6:8, 7:58-8:8, 10:35--65, 13:16-14:37; Ex-1005, FIG. 4, 3:29-61, 4:16-5:9, 5:40-6:12, 6:34-51; Ex-1009, FIG. 9, 2:61-5:21, 7:4-57, 9:15-10:37; Ex-1010, FIG. 9, 3:4-4:9, 4:32-5:57, 7:1-36, 9:10-49, 10:4-32.) (Ex-1002, ¶¶97-98.)

“When a location estimate of the MU is desired” at a current location, the MU captures information from signals received from surrounding antenna stations and creates a fingerprint. (Ex-1011, 4:42-46, 5:20-6:8, 7:64-8:44, 9:25-10:27; Ex-1005, 3:29-4:24; Ex-1009, 3:60-4:44; Ex-1010, 3:56-5:19.) The fingerprint may use “*many different parameters, either individually or in combination,*” including signal strength and station ID. (Ex-1011, FIG. 9, 4:55-63; Ex-1005, 3:40-49.) The MU is “equipped...to determine the strength of the received signal” and extracts identifier information. (Ex-1011, 3:55-58, 5:20-32, FIG. 9; Ex-1005, 3:57-4:18; Ex-1009, 3:7-4:44; Ex-1010, 3:4-4:44.) (Ex-1002, ¶98.)

The MU compares the fingerprint information for the monitored location with stored fingerprint information for selected locations in a database to determine whether it is “at a particular location or not.” (Ex-1011, 4:23-25, 4:43-47; Ex-1005, 3:10 18.) Upon a match (or close match), the MU determines the MU is in proximity of the matching fingerprint location. (Ex-1011, FIGS. 9-10, 5:61-6:8, 7:58-67, 8:1-13:15, 14:10-37, 17:15-19; Ex-1005, 3:29-4:37, 4:65-6:51, FIGS. 4-5; Ex-1009, 3:40-4:46, 5:1-9:14; Ex-1010, 3:37-5:19, 7:1-9:10; Ex-1002, ¶98.)

The “station(s)” communicating with the MU would have been understood as continuously operating fixed-location service-area antenna stations, given they communicate RF signals within respective service areas with the MU having an antenna, consistent with known wireless network infrastructures. (Ex-1002, ¶99;

Ex-1011, FIG. 2, 1:18-48, 3:42-4:61, 5:33-54, 7:58-67, 13:27-31, FIG. 9, 6:31-39 (“base station signal strengths”); Ex-1005, 1:10-34, 2:40-3:9, 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; Ex-1007, FIGS. 3-4, ¶¶0009-0020, 0183-0185 (“standard high traffic, fixed location base stations...”), 0193, 0236-0237 (fixed BS 122); Ex-1001, 1:49-5:13.) *Spain-I* discusses coverages areas served by identified antenna stations. (Ex-1011, FIG. 14 (below), 10:29-13:15.) (Ex-1002, ¶¶99-100; *infra* §§IX.A.1(a)-(b).)

FIG. 11

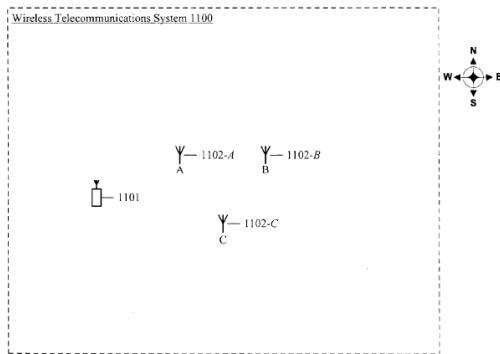
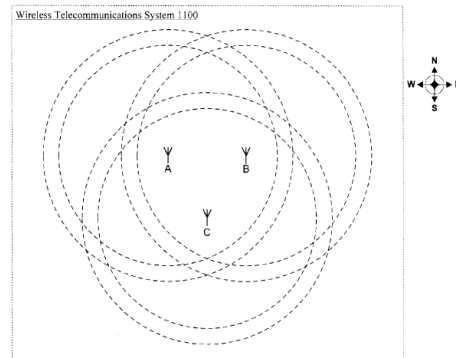


FIG. 14



Thus, a POSITA would have understood that *Spain-I*'s antenna stations substantially continuously operate (consistent with known stations). (Ex-1002, ¶101; Ex-1011, 8:1-8, 9:64-67, 10:64-67, 13:16-55, 14:1-3.)

To the extent PO argues (or it is determined) *Spain-I* does not disclose such features, a POSITA would have found it obvious to configure *Spain-I*'s system/processes to operate with such stations, consistent with known wireless infrastructures like that contemplated by *Spain-I*. (Ex-1002, ¶102; 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; Ex-1007 (*supra*); Ex-1027, FIGS. 1-2, 16, ¶¶0002-0021, 0042-0045, 0102-0103.)

Such features would have been a foreseeable and obvious implementation of known technologies within the skills of a POSITA, who thus would have had a reasonable expectation of success in implementing. (*Id.*) Such features would have been further obvious for reasons in §IX.A.1(b)(ii)(3). (Ex-1002, ¶103.)

a) (a) the first portable RF communications device monitoring its location by

(i) receiving communications signals from a first plurality of the antenna stations,

(ii) identifying at least one ID within at least one of the received communications signals, and

(iii) measuring the signal strengths associated with a received communications signal from the first plurality of antenna stations; and

Spain-I (including as modified herein) discloses/suggests these limitations. (Ex-1002, ¶¶104-110.) The MU monitors its location by receiving signals from antenna stations, identifying at least one ID within at least one received signal (*e.g.*, station ID), and measuring signal strengths associated with a received signal from a first plurality of stations (*e.g.*, stations in communication range with the MU when the current location fingerprint information is collected/generated). (*Supra* §IX.A.1(pre); *infra* §IX.A.1(b).)

When at a current/monitored location, the MU “capture[s] predetermined information from a predetermined portion of the RF spectrum.” (Ex-1011, 3:5-16, 4:42-54, 3:55-58 (obtaining information from RF spectrum), 5:20-22, 6:9-30 (MU capturing fingerprint of “current location”); Ex-1005, FIGS. 1-3, 1:40-54, 2:5-16, 2:32-3:9, 3:29-39, 4:38-5:9, 5:20-58, 6:2-11; Ex-1009, 3:60-63; Ex-1010, 3:56-60.) The MU determines “the strength of the received signal” and collects/extracts identifier information (station ID) from the received signal(s). (Ex-1011, 3:55-58, 5:20-32; 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 for its current location using that information (station IDs and signal strengths). (§IX.A.1(pre); Ex-1011, FIGS. 9-10, 4:55-63, 5:20-32, 5:33-6:8, 7:64-8:44, 9:25-10:27, 13:16-33; Ex-1005, FIG. 4, 3:29-4:24, 5:40-6:12; Ex-1009, FIG. 9, 3:63-4:44, 5:7-21; Ex-1010, FIG. 9, 3:60-4:44, 5:5-19.) (Ex-1002, ¶¶104-108.)

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 (station ID (blue) and measured signal strengths (yellow)); *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). (Ex-1002, ¶¶107-109.)

Accordingly, *Spain-I* discloses the MU monitoring its location by performing the processes as claimed in limitation 1(a). (Ex-1002, ¶110; *infra* §IX.A.1(b).)⁷

b) 1(b) the first portable RF communication device determining if a monitored location is within proximity of a location chosen by a user of the first portable RF communication device, as a result of

(i) electronically comparing the at least one ID and at least one figure based on the signal strengths of the first plurality of antenna stations at the monitored location with the at least one ID and the at least one figure based on signal strengths of the first plurality of antenna stations at the location chosen by the user, and

(ii) determining if the difference between the signal strengths measured at the monitored location and the signal strengths at the location chosen by the user is less than a predetermined threshold.

⁷ To the extent PO argues, or it is determined, that *Spain-I* does not disclose features in limitation 1(a), such features would have been obvious for reasons similar to those discussed for limitation 1(b) (§IX.A.1(b)). (Ex-1002, ¶110.)

Spain-I in view of *Hunzinger* and *Nanda* discloses/suggests these limitations.

(Ex-1002, ¶¶111-183.)

Spain-I's MU determines whether it is currently “at a particular location or not.” (Ex-1011, 4:23-25, 4:43-47⁸; Ex-1005, 3:10-18; §IX.A.1(pre)-1(a).) The MU electronically compares fingerprint information (including signal strengths and station ID(s)) for the MU's current location (§IX.A.1(a)) with stored fingerprint information (having similar parameters) associated with particular location(s) to determine a “closest” match. (§§IX.A.1(a), *infra* IX.A.1(b)(ii)(2).) Upon a “match” (or close match) the “corresponding location in the database is then chosen as the location of the mobile unit.” (Ex-1011, 5:61-6:4, 8:1-26; §§IX.A.1(pre)-1(a); Ex-1002, ¶112.) *Spain-I* also discloses various ways to build the database, determine closeness, and refine the analysis. (Ex-1011, FIGS. 1-3, 9-10, 5:61-6:8, 7:58-67, 8:1-13:15, 14:10-31, 17:15-19; Ex-1005, 3:29-4:37, 4:65-6:51, FIGS. 4-5; Ex-1009, 3:40-4:46, 5:1-9:14; Ex-1010, 3:37-5:19, 7:1-9:10; Ex-1002, ¶113.)

Spain-I discloses and/or suggests features/functionalities attributable to claim 1, but does so in some instances without certain details for particular claimed features. Petitioner demonstrates below how such features would have been obvious

⁸ The MU can initiate location determining processes (Ex-1011, 4:43-47.)

in view of the collective teachings/suggestions of *Hunzinger-Nanda*.⁹ (*Infra* §§IX.A.1(b)(ii)(1)-(3); Ex-1002, ¶¶114-115.)

(1) Determining if a Monitored Location is Within Proximity of a Location Chosen by a User

Regarding limitation 1(b), the '583 patent describes features where a mobile device determines its location by comparing current location signal strengths with desired location signal strengths (Ex-1001, 18:56-19:7) and when the strengths “are identical,” the “cell phone is determined to have returned to the desired location (i.e., current location=desired location)” (*id.*, 19:8-60; *id.*, 7:10-26, 8:62-9:10, 18:17-24). During prosecution, the applicant described “part (b) of Claim 1”—*i.e.*, “determining if the monitored location is within proximity to the chosen location—*or in other words, determining if the user has reached the desired location or has left the desired location.*” (Ex-1004, 100.) *Spain-I* in view of *Hunzinger* and *Nanda*

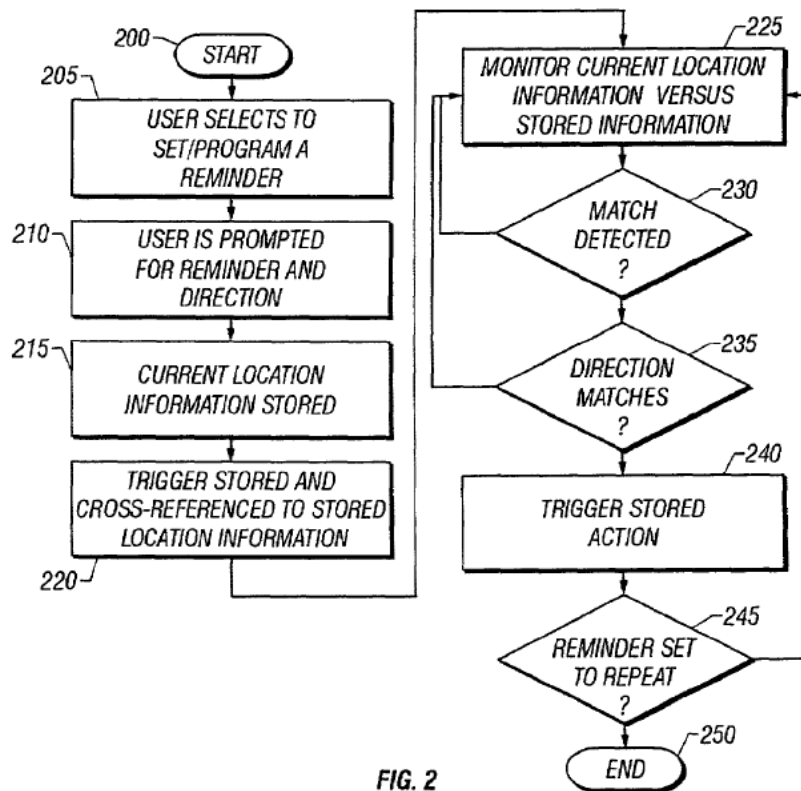
⁹ The obviousness positions do not rely on bodily-incorporation of components/processes from one reference to another, but rather references to combined prior art or the like is short-hand for the resulting modified/configured system/process in light of the teachings/suggestions in the prior art. (Ex-1002, ¶115.) *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007); *Facebook, Inc. v. Windy City Innovations, LLC*, 973 F.3d 1321, 1343 (Fed. Cir. 2020).

discloses and/or suggests the above-claimed proximity determining features in context of the claim language, specification, and file history. (Ex-1002, ¶¶116-117.)

For instance, *Spain-I* describes generating/storing in a database fingerprints corresponding to selected location(s). (§IX.A.1(pre)-(b)(ii); Ex-1011, FIG. 9, 3:42-4:63, 5:20-6:31, 7:58-8:26, 13:16-14:37; Ex-1005, 2:40-3:11; 3:23-6:56.) *Spain-I* discloses configurations where a user can initiate a request that causes “the MU [to] capture[] the fingerprint of its current location.” (Ex-1011, FIG. 3, 6:9-30, 6:43-47; Ex-1005, 6:43-47; Ex-1002, ¶¶118-120.) While such teachings relate to location server 30 maintaining the fingerprint database and performing fingerprint matching processes, they also suggested to a POSITA that the MU may be configured to receive user requests to measure/collect other fingerprint locations. *Spain-I* thus suggests the concept of user initiated location-based fingerprint data collection. Such suggestions (with the understanding that there were various ways and reasons for implementing user interface and location selection/programming techniques, including for building a database) would have motivated a POSITA to consider teachings in the art when considering *Spain-I*. Upon doing so, a POSITA would have been persuaded by *Hunzinger*’s teachings (and *Nanda*’s), and thus found it obvious to configure *Spain-I*’s system/processes to determine if the MU’s current location was in proximity of a user chosen location, consistent with that claimed (and described in the ’583 patent/file history). (Ex-1002, ¶¶121-122.)

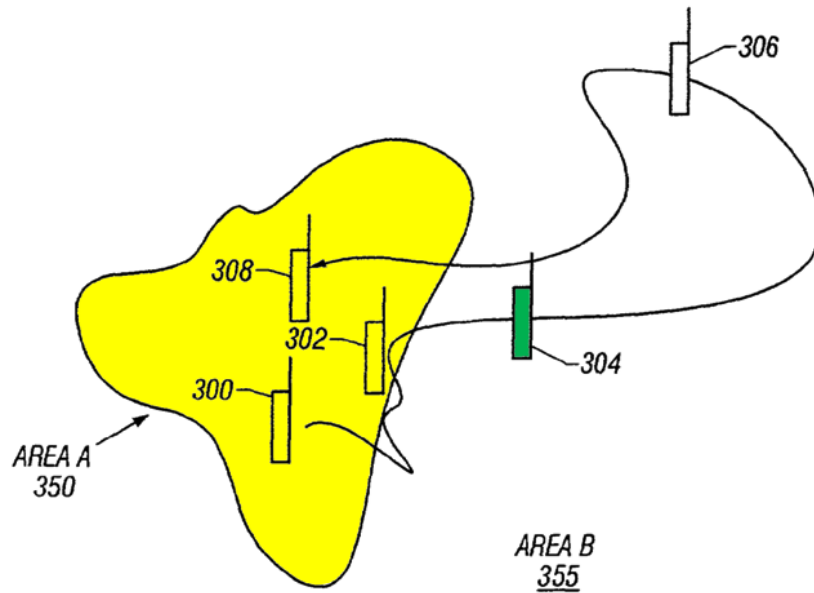
Like *Spain-I*, *Hunzinger* is in the same technical field as the '583 patent and discloses features reasonably pertinent to particular problem(s) the '583 patent (and a POSITA) looked to solve, and thus would have been consulted by a POSITA contemplating *Spain-I*. (§IX.A.1(b)(ii); Ex-1054, 1:13-2:49, 3:44-4:59, 6:37-8:44 (and below); §IX.A.1(pre)-(a); Ex-1001, Abstract, 1:23-10:25, 3:26-35, 5:14-56; Ex-1002, ¶¶123-128.)

Indeed, *Hunzinger* discloses a location determining system/process where a mobile device (with “position location technology”) is configured to allow a user to choose locations and related actions that are performed when the device is determined to be at such chosen locations. (Ex-1054, Abstract, FIGS. 1A-4, 1:38-2:6, 2:10-44, 3:4-67, FIG. 2 (below); Ex-1002, ¶¶88-93, 123.)



Position-monitoring functions “compare[] one or more ‘remembered’ locations with current location information.” (Ex-1054, 3:56-60.) Location information (e.g., “station ID,” “signal conditions,” “signal strength,” etc.) is stored that “allow[s] the terminal to *recognize whether or not it has left or returned to the same location.*” (*Id.*, 4:1-12, 6:37-49, 7:9-22; *infra* §IX.A.1(b)(ii)(2).) Such information can include a “set area [that] may be defined several ways” (e.g., point/radius, geographic geometric shape, etc.). (Ex-1054, 4:12-18.) “The *location area characteristics may be settable by the user....*” (*Id.*, 4:18-20.) (Ex-1002, ¶124.)

The device stores location trigger/action information and monitors “the current location until it is outside of the ‘set’ location area.” (Ex-1054, 4:21-24.) “[T]he 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; 4:31-38 (monitoring continues until stored and current location information match), 4:44-5:22, FIG. 3 (annotated below).) (Ex-1002, ¶125.)



The device is configured to allow the user to easily choose locations and corresponding actions/reminders to be executed based on chosen location(s). (Ex-1054, 5:22-40, 5:51-52 (“user may select the current location...”), FIG. 4 (below); Ex-1002, ¶126.)

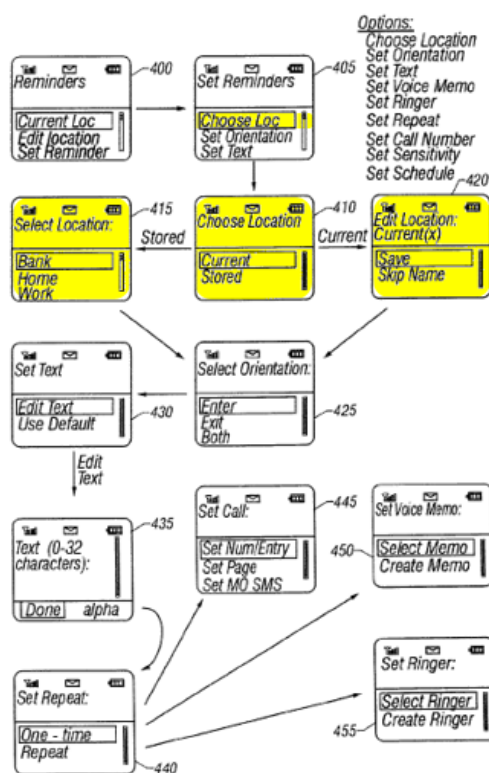


FIG. 4

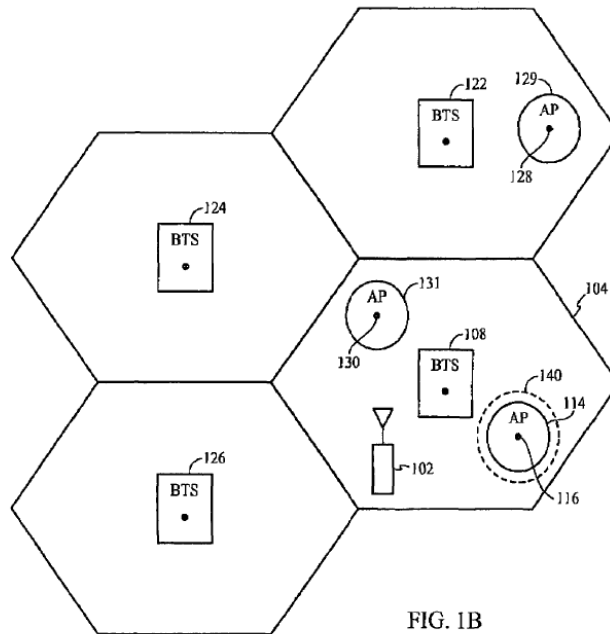
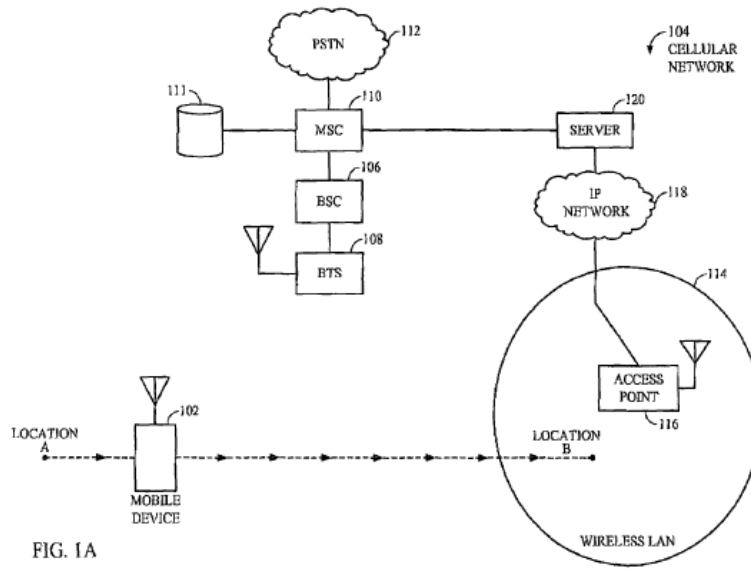
The user may chose trigger conditions for such actions/reminders, such as when exiting or entering a region, or both. (Ex-1054, 5:52-61.) Reminder actions can take many forms. (*Id.*, 5:62-6:7.) (*See also id.*, 6:8-22 (accuracy improved via multiple measurements, averaging, as “well known in the art”); Ex-1002, ¶127.)

Hunzinger’s teachings were consistent with technologies/techniques known to a POSITA at the time. (Ex-1002, ¶129; Ex-1016, Abstract, FIGS. 1:18-4:63, 6:30-7:3, 14:38-44 (geofence), 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 (zones/tasks); Ex-1061, FIG. 13c, 1:61-2:8, 8:54-9:10, 21:4-13.) Indeed, a POSITA would have likewise found *Nanda*’s teachings beneficial in considering ways to

allow a user to choose locations from which fingerprint data is collected for the database. (*Id.*)¹⁰

Nanda discloses describes systems/processes that determine whether a mobile device is “in the vicinity of” a location by comparing fingerprint information. (Ex-1006, FIGS. 1A-1B (below), 2:16-59, 3:48-4:14, 5:50-7:28; Ex-1002, ¶¶70-76, 132.)

¹⁰ A POSITA would have been motivated to consider *Nanda* for reasons explained below (§IX.A.1(b)(ii)(2)). (Ex-1002, ¶¶129-130.) Thus, *Nanda*’s teachings here (and below) would have contributed to the rationale for configuring *Spain-I* as discussed in view of *Hunzinger*. Indeed, an invention is likely obvious where it merely combines familiar elements according to known methods and yields only predictable results. *KSR Intern Co. v. Teleflex, Inc.*, 550 U.S. 398, 416 (2007). Here, Petitioner’s evidence of multiple references that disclose known features (*e.g.*, user chosen location, ID/signal strength comparisons (§IX.A.1(b)(ii)(2))) bolsters obviousness, rather than detracts from it. *See, e.g., Bayer Pharma AG v. Watson Laboratories, Inc.*, 874 F.3d 1316, 1321-24 (Fed. Cir. 2017) (“Here, the **motivation** to formulate an ODT version of vardenafil is **plainly evident from the face of multiple prior art references** disclosing ODT formulations of ED drugs. No further rationale for developing vardenafil ODT was necessary.”); *Chanel, Inc. v. Molo Design, Ltd.*, IPR2022-00544, Paper 44 at 28, 33 (P.T.A.B. Aug. 9, 2023).



(See also Ex-1006, 4:64-6:3 (base stations identified by “base station identifier and a signal strength”), 6:4-7:28 (MAC ID, RSSI, etc. fingerprint information “used by the mobile device to determine the proximity of a second communication network”),

6:52-58 (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”).) (Ex-1002, ¶¶133-134.)

Thus, like *Hunzinger-Spain-I*, *Nanda* discloses features in the same technical field and address problems similar to that as the ’583 patent, and thus would have been consulted by a POSITA for reasons above and those below (§IX.A.1(b)(ii)(2)). (Ex-1002, ¶131.) Relevant here, and consistent with *Hunzinger* and state of art (Ex-1054, 3:29-5:22; Ex-1053, ¶¶0007-0013), *Nanda* describes features that allow a mobile device user to select when to create a fingerprint, which causes fingerprint information (*e.g.*, strength/ID data) to be collected/measured while the MU is at a location chosen by the user. (Ex-1006, 8:29-36 (describing keypad 212 a user may use to cause device 102 “to create a current fingerprint and store that fingerprint in memory 211”), FIG. 2 (below).) (Ex-1002, ¶¶135-136.)

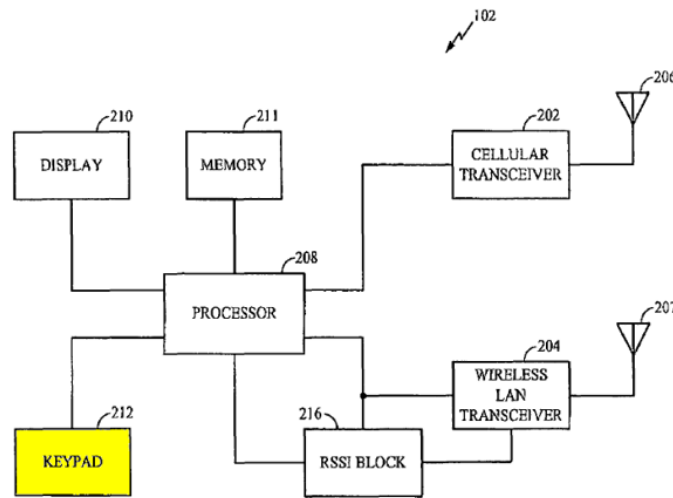


FIG. 2

“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....” (Ex-1006, 9:61-10:7, FIG. 3A (below); Ex-1002, ¶135.)

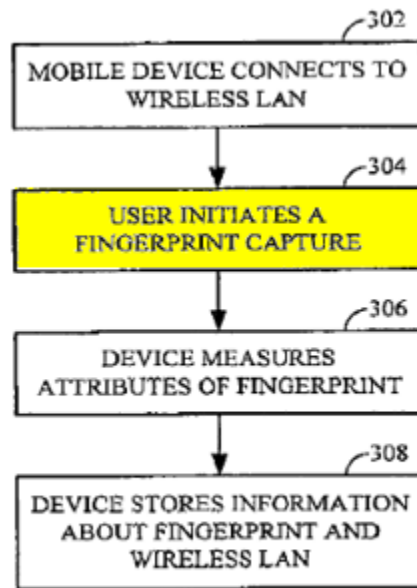


FIG. 3A

In light of *Hunzinger* and *Nanda*,¹¹ a POSITA would have been motivated, and found obvious, to configure the MU in the *Spain-I* system/process with mechanisms/features consistent with the user chosen location and location-based action features like that taught/suggested by *Hunzinger* (and *Nanda*). (Ex-1002, ¶137.) A POSITA would have appreciated *Spain-I*'s above-noted teachings (MU user position requests (Ex-1011, 5:61-6:30)) along with the advantages/benefits/teachings associated with *Hunzinger*'s mechanisms for enabling a MU user to choose location(s) from which location information is

¹¹ While *Hunzinger* alone supports obviousness here, *Nanda* further bolsters the motivation/reasons for configuring *Spain-I* as explained and noted (n.10).

collected for comparison with current location information to determine whether the MU is at, entered, or left the chosen location in order to trigger corresponding selected actions. (Ex-1002, ¶¶137-138.)

For example, configuring the MU with user-friendly interface mechanisms (*e.g.*, menus (*Hunzinger*), key-based (*Nanda*)) and related functionalities that enabled a user to easily choose locations would have enhanced the way the *Spain-I* system facilitated how locations are selected to build the fingerprint database, thus promoting use of the modified system while expanding its potential applications. (*Id.*, ¶139.) Moreover, a POSITA would have discovered from *Hunzinger* additional benefits in allowing the user to both chose locations, but also corresponding action(s) to be performed upon determining the MU is within proximity of a chosen location (*e.g.*, at, entering, or left a user chosen). (Ex-1002, ¶139; Ex-1054, FIGS. 1A-4, 1:38-2:44, 3:4-67, 4:1-5:22; §IX.A.1(b).) Such features 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 application options, consistent with *Hunzinger* (*e.g.*, Ex-1054, 2:10-44, 5:29-6:30), a POSITA's state of art knowledge (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). (Ex-1002, ¶¶140-141, 144.)

Thus, in some exemplary applications, such modification(s) would have predictably resulted in the *Spain-I* database maintaining fingerprints corresponding to locations of interest to the user so that later, depending on how programmed/user-configured, when the MU is determined to be in proximity of such a location (*e.g.*, retailer, service provider/vendor, etc.), relevant personalized services can be provided by, *e.g.*, the MU, location server 30, other server, consistent with *Spain-I-Hunzinger's* teachings and that known in the art. (Ex-1011, 3:5-16, 4:23-33; Ex-1002, ¶¶142-144; Ex-1033, 1:43-59, 5:46-6:38; Ex-1016, 1:18-4:63, 6:30-7:3, 16:41-67; Ex-1028, Abstract, FIGS. 4-8, 1:10-4:14, 5:10-16, 5:16-63, 7:23-8:28; Ex-1029, FIGS. 6A-6E ¶¶0033-0034, 0045, 0063, 0071, 0074-0075.) Given the familiar features/technologies taught by *Spain-I-Hunzinger* (and *Nanda*) and state of art (*e.g.*, Ex-1011, 3:34-40, 15:19-35; Ex-1062, 1:26-33; Ex-1028, 12:55-13:18), a POSITA would had the skills/knowledge/rationale to consider/implement such modifications with a reasonable expectation of success. (Ex-1002, ¶¶145-146.)

There were various ways to configure/implement such features. For example, a POSITA would have found it obvious to configure the modified *Spain-I* system/processes such that the MU included user-selection interface mechanisms/features (similar to those described by *Hunzinger*) to allow the MU user to choose location(s) (where ID/signal strength data was collected/measured for building the fingerprint database as discussed in §IX.A.1(b)). Likewise, a POSITA

would have found it obvious to configure the MU to perform features that performed user-selected actions/operations upon determining that the MU is at, has entered, or is no longer in a user chosen location. (Ex-1054, 4:1-5:22; Ex-1011, 4:23-26; Ex-1006, 2:16-59; *infra* §IX.A.1(b)(ii)(2); Ex-1002, ¶¶142-146.)

Thus, the *Spain-I-Hunzinger-Nanda* combination discloses/suggests the above-noted features of limitation 1(b), whether such proximity features encompass the monitored location being at the chosen location, or that the MU/user has entered or left such location, consistent with the plain claim language, including in context of the specification and/or file history. (Ex-1002, ¶147.)

**(2) Comparing ID and Signal Strengths Figure(s)
and Difference/Threshold Features**

Spain-I discloses comparing the “generated fingerprint” with “the fingerprints in the database” and choosing the MU location as the one corresponding to the “closest” matching fingerprint in the database. (Ex-1011, 5:66-6:14, 4:55-63 (fingerprints based on station ID/signal strength); Ex-1005, 4:22-36.) “There 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; Ex-1002, ¶¶148-151.)

While *Spain-I* discloses such fingerprint comparison features, *Spain-I* does not provide details as to how such comparisons are performed/used, including in

context of the underlying parameters (comparing monitored and user chosen location station ID/signal strengths) (**limitation 1(b)(i)**) or determining whether a difference between signal strengths measured at the monitored location and those at the (user) chosen location (see *supra* IX.A.1(b)(ii)(1)) is less than a predetermined threshold (**limitation 1(b)(ii)**). (Ex-1002, ¶¶150, 152.) However, a POSITA would have understood there were various ways for analyzing fingerprints/signal characteristics to determine location proximity, and thus would have been motivated to consider teachings in the art. (*Id.*, ¶153; 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.) Upon doing so, including for reasons noted above (§IX.A.1(b)(ii)(1)), a POSITA would have been motivated by the collective teachings of *Hunzinger-Nanda* (see n.10), and found it obvious, to configure the MU in the above modified *Spain-I* system/processes (*id.*) to determine if the MU's monitored location is in proximity of a user chosen location (**limitation 1(b)**) by electronically comparing at least one station ID and at least one figure based on the signal strengths of the first plurality of antenna stations at the monitored location with the at least one ID and the at least one figure based on signal

strengths¹² of the first plurality of antenna stations at the location chosen by the user, as claimed in **limitation 1(b)(i)** and determine if a difference between the compared signal strengths was below a predetermined threshold as claimed in **limitation 1(b)(ii)**. (Ex-1002, ¶153.)

For example, *Hunzinger* further discloses the mobile device monitors its current location, and “compares” remembered location information with current location information to determine whether the device has left or entered a remembered location to execute particular actions. (Ex-1054, 3:49-60, 4:21-57; §IX.A.1(b)(ii)(1).) Location information can include “station ID” and “signal strength.” (Ex-1054, 4:3-8, 6:37-49 (claim 1 (comparison between current terminal *location information* and first set of *location information*)), 7:9-22 (*e.g.*, claim 8 (“said *location information* consists of at least one of...*base station identifier*, pilot *signal strength*...”)), 7:29-42, 8:25-38; §IX.A.1(b)(ii)(1) (*Hunzinger*).) (Ex-1002, ¶¶154-155.)

FIG. 3 (below) illustrates an exemplary monitoring/triggering action where the device “monitors the current location information *compared* to the stored reminder *location information*.” (Ex-1054, 4:60-5:22 (reminder triggered in when

¹² The claimed “figure...” encompasses signal strengths measurements. (Ex-1001, 27:41-43 (claim 22).)

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.) (Ex-1002, ¶¶156.)

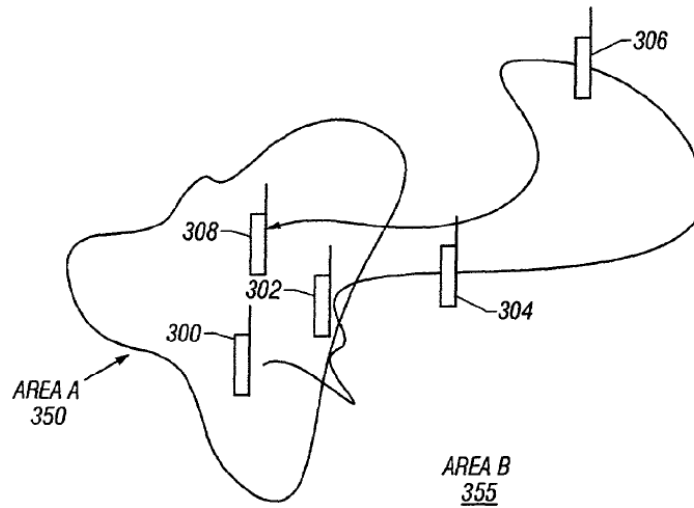


FIG. 3

Hunzinger's teachings were consistent with technologies/techniques known to a POSITA. (*Supra* (state-of-art); Ex-1002, ¶157.) For example, in consulting *Nanda* for reasons above (§IX.A.1(b)(ii)(1)) a POSITA would have discovered teachings of comparing signal strength and station ID data for current and stored fingerprints when determining if a device is in proximity of a location. (§IX.A.1(b)(ii)(1); Ex-1006, FIGS. 3A-3B, 2:43-51, 6:12-66, 7:6-13, 8:29-55.) For example, *Nanda* discloses storing previously monitored location information (IDs/signal strength) like the table below.

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	$S_1(B_2) \dots s_n(B_2)$	

(Ex-1006, 8:29-55, 9:31-10:13; 8:56-9:13; Ex-1002, ¶158.) The device may “calculate a fingerprint for its current location and compare it” to the stored information. (Ex-1006, 9:17-20, 10:14-25.) *Nanda* also defines a “deviation amount” (e.g., $d_1(A_1) \dots d_n(A_1)$) associated with signal strength figure(s) (e.g., $S_1(A_1) \dots S_n(A_1)$) to “help control the determination of whether a finger matches a stored fingerprint.” (*Id.*, 10:36-38, 10:22-25.)

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.) (Ex-1002, ¶159.)

Nanda describes how the MU captures a current location fingerprint (including signal strengths). (Ex-1006, FIG. 3B (below), 3:18-19, 10:51-56; Ex-1002, ¶160.)

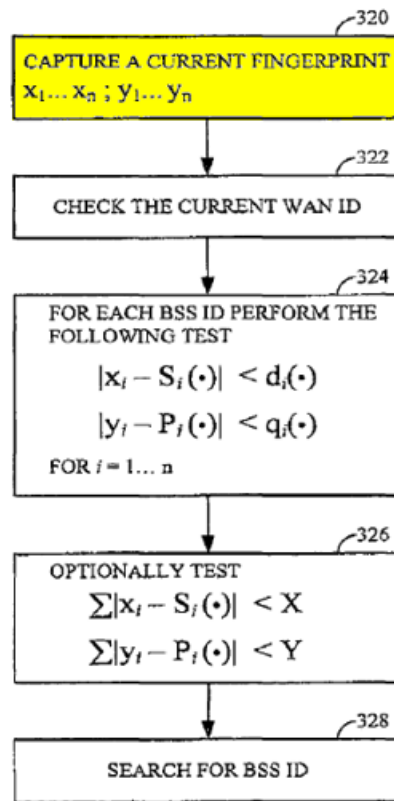


FIG. 3B

At step 322, the current WAN ID is checked and identified access point information is determined for the current location. (Ex-1006, 10:58-60; *id.*, 9:31-52 (BSS ID corresponding to access point), 10:60-61; Ex-1002, ¶161.)

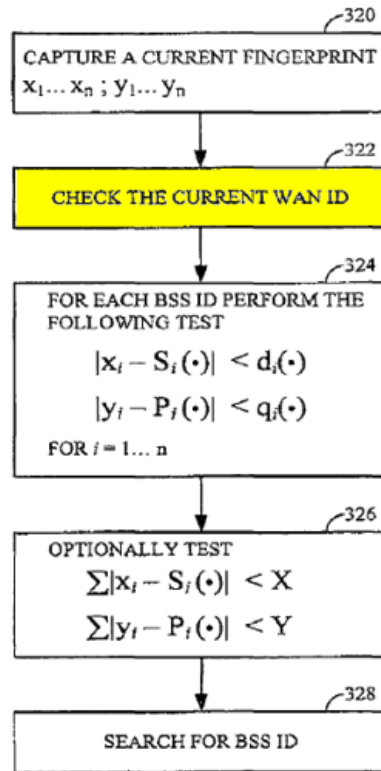
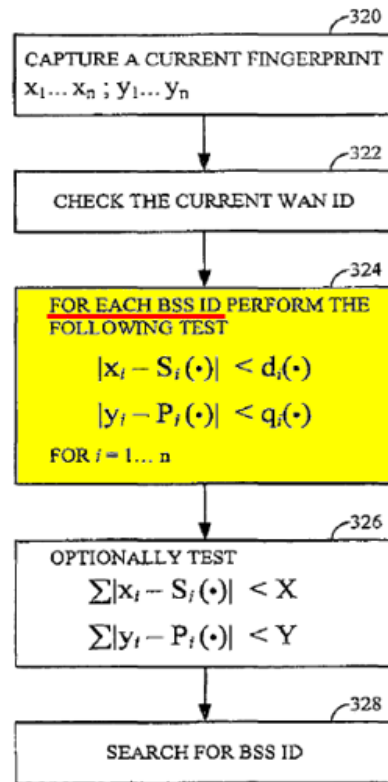


FIG. 3B

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. (Ex-1002, ¶162.)



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

(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.*) (Ex-1002, ¶163.)¹³

¹³ (See Ex-1006, FIG. 3B (step 326), 11:11-18 (optional test comparing sum of differences to threshold X); Ex-1002, ¶165.)

Nanda's comparisons performed for each WAN ID (322) and "each BSS ID" (324) indicates a comparison of respective station IDs since the stored figure(s) ("Si") and current figure(s) ("Xi") are compared for the same BSS ID and associated WAN ID. (Ex-1006, 10:60-61 ("[f]urther search refinements are possible by **searching the database for identifiers of the observable pilots**").) Thus, before signal strength comparisons (step 324), the system compares monitored station identifiers to identifiers stored in the database. (*Id.*; Ex-1006, 10:58-66, 11:33-12:13; Ex-1002, ¶¶163-166.)

In light of *Hunzinger-Nanda*, a POSITA would have been motivated, and found obvious, to configure the above-modified *Spain-I* system/processes (§IX.A.1(b)(ii)(1)) such that the MU's location determining processes include comparing at least one station ID and at least one figure based on the signal strengths (*e.g.*, SS value(s)) for a current monitored location with at least one station ID and at least one figure based on the signal strengths (*e.g.*, SS value(s)) for the user chosen location in the fingerprint database (§IX.A.1(b)(ii)(1)). (Ex-1002, ¶167.) Comparing IDs would have allowed the MU to use signal strengths corresponding to signals received from the same antenna stations when performing location determining processes. (*Id.*) A POSITA also would have been motivated and found obvious from the collective teachings of *Nanda-Spain-I-Hunzinger* to configure the MU to determine if its monitored location is within proximity of a user chosen

location based on whether a difference between compared signal strengths for the monitored and user selected locations is below a predetermined threshold like that claimed and suggested by *Hunzinger/Nanda*. (*Id.*)

A POSITA would have appreciated *Spain-I*'s teachings/suggestions (§§IX.A.1(pre)-1(b)(ii)(2)) in context of those of *Hunzinger* and *Nanda* (comparing signal strengths/IDs for current and stored locations and difference/threshold features), and thus been motivated to employ similar features in the above-discussed *Spain-I* system/processes (§IX.A.1(b)(ii)(1)). Such features would have enhanced the MU's processes by using relevant signal characteristics in determining whether the MU's monitored location is in proximity of a user selected location, promoted accuracy, and conserved resources, 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)(ii)(1); Ex-1002, ¶¶168-174; Ex-1054, 3:49-60, 4:3-5:22, 6:37-49, 7:9-22.) For example, ID comparisons (like that taught by *Hunzinger/Nanda*) would have beneficially reduced the possible locations being assessed, as contemplated by *Spain-I*. (Ex-1011, 10:20-27.) The suggested configuration also would have benefited *Spain-I*'s modified system/processes by providing a determinable range of acceptable signal strength difference(s) (*e.g.*, below a predetermined threshold) to gauge when such strengths are close enough to

ascertain whether or not the MU is currently within the proximity of a user chosen location corresponding to a fingerprint in the database of *Spain-I*. (Ex-1002, ¶171.)

Such features would have complemented *Spain-I*'s understanding of the “many choices” for determining closest matching fingerprints. (Ex-1011, 8:9-26.) Consequently, in light of the guidance provided by *Hunzinger* and *Nanda* (and a POSITA's knowledge in the art) in context of *Spain-I*, a POSITA would have appreciated the benefits of comparing monitored/user chosen location ID and signal strength data and using a predetermined threshold for evaluating compared strength values (like that discussed above and as claimed) in determining when compared signal strengths are close enough to result in a determination that the MU is at or proximate to a user selected location to ensure the appropriate actions could be performed by the *Spain-I* modified system in light *Hunzinger* and *Nanda*. (Ex-1002, ¶172; §IX.A.1(b)(ii)(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.)

A POSITA would have leveraged their experience and skills, along with the teachings of *Spain-I/Hunzinger/Nanda* to, for example, program/configure the MU to implement the above-discussed ID/strength comparison and threshold features like that claimed, which would have predictably resulted in conserved processing/memory resources by, *e.g.*, avoiding comparison operations (and other subsequent location determining operations) if no station IDs matched (*e.g.*, such as

when the MU has received signals from station(s) that was/were not previously within communication range to facilitate generation of a fingerprint in the database). (Ex-1002, ¶¶173, 176.) Furthermore, implementing predetermined threshold features as discussed above would have promoted accuracy in determining whether the MU monitored location was proximate to a previously user chosen location in the database (§IX.A.1(b)(ii)(1)), as the threshold would have been programmable based on design parameters/criteria for a given application of the modified *Spain-I* system/processes (*e.g.*, difference variances may change depending on the application for the designed system/processes). (Ex-1002, ¶174.) Once defined, the threshold would have been predetermined during execution of the location determining processes performed by the modified *Spain-I* MU. (*Id.*) A POSITA would have considered known tradeoffs—balancing costs, processing resources, benefits resulting from such modification, and the like—to ultimate design and configure the modified *Spain-I* system/processes with such ID/signal strength comparison and predetermined threshold features in a successful manner relevant 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; Ex-1002, ¶¶174-175.)

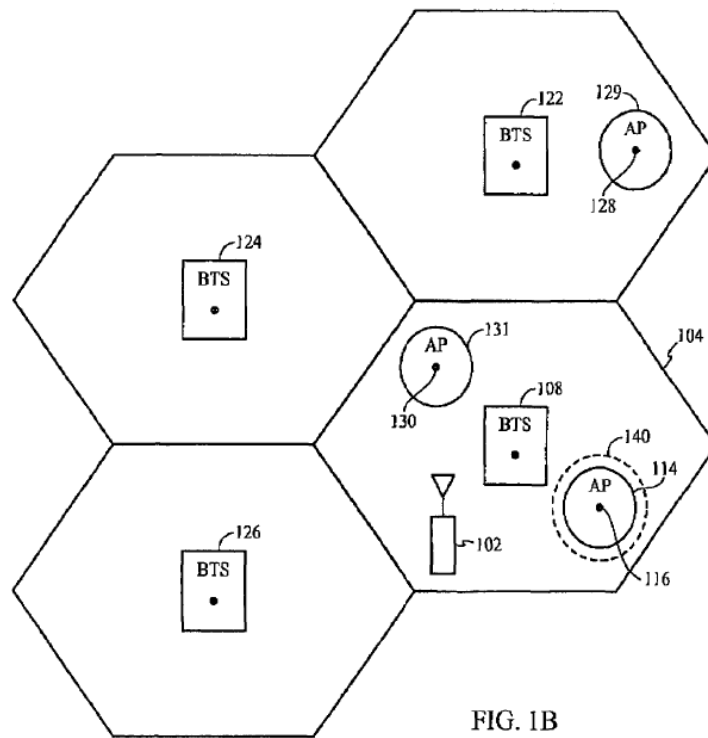
Thus, given the modifications would have involved use of technologies/techniques within the capabilities/knowledge of a POSITA (as demonstrated by *Spain-I-Hunzinger-Nanda* and state-of-art teachings above), a

POSITA would have had a reasonable expectation of success in implementing such modifications. (Ex-1002, ¶176.) Consequently, the modified system/process would have predictably resulted in the MU performing location determining features consistent with that claimed in limitations 1(b)(i)-(ii). (*Id.*)

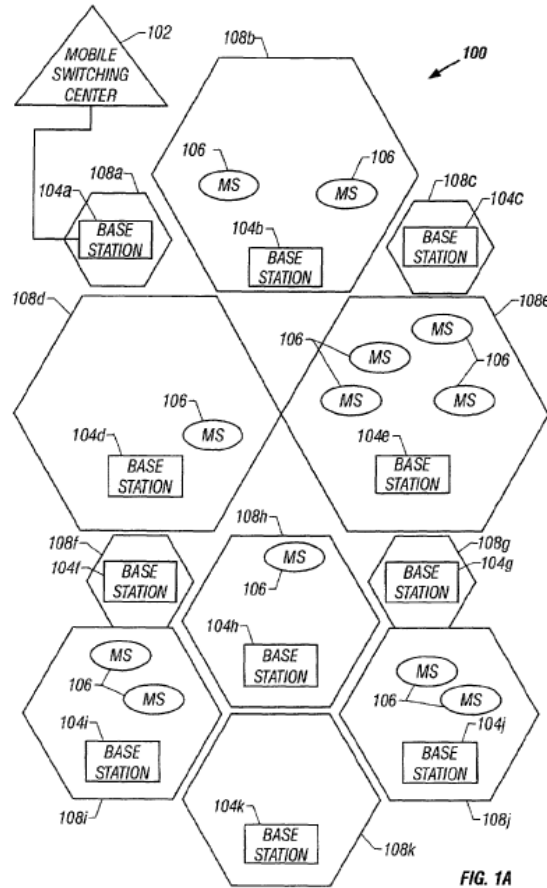
(3) Substantially Continuously Operating Fixed-Location Service Area Antenna Stations

As explained for limitation 1(pre), *Spain-I* discloses or renders obvious, the MU working in conjunction with ***continuously operating fixed-location service area antenna stations*** as claimed. (§IX.A.1(pre).) To the extent PO argues or it is determined that *Spain-I* does not disclose (or by itself support obviousness of) ***continuously operating fixed-location service area antenna stations*** as claimed, it would have been obvious to implement them in light of *Nanda* and *Hunzinger*. (Ex-1002, ¶177.)

Upon considering *Nanda-Hunzinger* for reasons above (§§IX.A.1(b)(ii)(1)-(2)), a POSITA would have recognized that *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.)



The BTSs and access points are examples of substantially continuously operating fixed-location service area antenna stations given they are in fixed locations and provide signals and facilitate radio communications with mobile device 102 within a coverage area provided by such stations. (Ex-1002, ¶¶178-180.) *Hunzinger* also discloses use of known base stations. (*Id.*, ¶181; Ex-1054, FIG. 1A (below), 1:21-54, 5:6-12, 7:9-14.)



A POSITA would have appreciated that implementing fixed antenna stations, similar to how those operate in the systems described by *Nanda* and *Hunzinger* (and known in the art), would have promoted use of *Spain-I*'s MU in known wireless network infrastructures, which involve wireless communications between an MU and stations to facilitate location-determination process similar to that disclosed by *Nanda*. (*Supra* §IX.A.1(b)(ii); Ex-1002, ¶182.) Thus, the disclosures of *Spain-I* coupled with those of *Nanda-Hunzinger* and a POSITA's knowledge in the art, would have motivated a POSITA to configure/implement the MU in the above modified *Spain-I* system/process to work in a wireless network including such fixed

substantially continuously operating antenna stations so that communication signals are substantially continuously provided to the MU, which are needed perform location determining operations like those discussed above in §§IX.A.1(pre)-IX.A.1(b)(ii)(1)-(2). (Ex-1002, ¶182.) Such modification would have involved known technologies/techniques and thus a POSITA would have had the skills/rationale and reasonable expectation of success to consider/configure/implement such features in the above-described modified *Spain-I* system/processes. (*Id.*, ¶183.)

2. Claim 2

- a) **The method of claim 1 wherein the chosen location signal strengths were measured by the first portable RF communication device.**

The *Spain-I-Hunzinger-Nanda* combination discussed above discloses/suggests claim 2 for the same reasons explained for claim 1, which demonstrates how the MU in the modified system/process measures signal strengths, including those for the user “chosen location.” (Ex-1002, ¶184; §IX.A.1(pre)-IX.A.1(b)(ii); *see also* Ex-1011, 3:55-58, 5:20-32, 13:49-55; Ex-1005, 3:57-61, 4:16-18; Ex-1006, 9:61-11:9.)

3. Claim 3

- a) **The method of claim 1 wherein the chosen location signal strengths were measured by a second portable RF communication device, different from the first**

portable RF communication device.¹⁴

The *Spain-I-Hunzinger-Nanda* combination discloses and/or suggests this limitation. (Ex-1002, ¶¶185-191.)

Spain-I explains that the MU communicates with location server 30 through a wireless infrastructure (Ex-1011, 3:8-12, 4:7-22) and describes configurations where the fingerprint database may be stored at server 30. (§§IX.A.1(a)-(b); Ex-1011, FIG. 3, 6:9-14, 6:15-30; Ex-1005, FIG. 3, 4:28-58; Ex-1009, 5:22-42; Ex-1010, 5:20-41.) Likewise, *Nanda* teaches/suggests similar features where a mobile device creates/sends fingerprint(s) to a remote database (Ex-1006, 12:14-31) and where such a remote database “receiv[es] fingerprints from multiple mobiles devices” to allow for a “much larger database of available access points than would be found in a single mobile device.” (*Id.*) (Ex-1002, ¶186.)

In light of such teachings/suggestions in context of the rationale/teachings/suggestions above (§IX.A.1(b)), a POSITA would have been motivated, and found obvious, to configure the modified *Spain-I* system/processes

¹⁴ The '583 patent specification describes one instance where a “different mobile telephone” may use the “same data” measured/transferred by a first device (Ex-1001, 10:18-25), which does not describe the “different” device measuring signal strengths of a user chosen location as recited in claim 3. (*Generally* Ex-1001.)

such that multiple MUs (including a second different MU different) measures/collects signal strengths from signals received when at a user chosen location selected by the user of the first MU (§IX.A.1(b)(ii)(1)) to generate respective fingerprints used for building a robust fingerprint database stored at a remote server, consistent with features contemplated by *Spain-I* and *Nanda*. (*Supra*; Ex-1002, ¶187.) Such modifications would have resulted in the modified *Spain-I* system/processes (§IX.A.1) using, in some instances, fingerprint information (station IDs/signal strengths) obtained/measured from a different (second) MU (which could have been operated by a different user or the same user of the first MU) and stored in a remote database for comparison to monitored location fingerprint information like that explained above. (§IX.A.1(b); Ex-1002, ¶187.)

A POSITA would have appreciated that such features would have allowed the modified *Spain-I* system/processes (§IX.A.1) to create/maintain a robust database of fingerprint information using measurements from multiple MUs, like that suggested by *Nanda* (Ex-1006, 12:26-29), thus beneficially expanding applications of *Spain-I*'s disclosed features. (Ex-1002, ¶188.) A POSITA 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)(ii)), as well as had similar capabilities, expectation of success, and state-of-art knowledge, that would have led to the above modifications discussed here. (Ex-1002, ¶188.) Indeed, *Spain-I* contemplated processes designed

to complement existing location determining technologies and augment their performance (Ex-1011, 3:34-40; §IX.A.1(b)(ii); *see also* rationale/citations in §IX.A.5 (regarding remote database features).)

A POSITA would have been motivated to implement such features regardless of the source of the fingerprints (*e.g.*, whether user chosen location signal strength measurements originated from a second MU or other MUs) because it would have resulted in a fingerprint database with signal characteristics from associated antenna stations obtained from multiple MUs, thus enhancing the accuracy of the fingerprint information. (§IX.A.1(b)(ii); Ex-1002, ¶189.) *See KSR*, 550 U.S. at 416. For instance, as it was known that users may own/use multiple mobile devices (*e.g.*, laptops, tablets, PDAs, mobile telephone, etc.), in one example, a POSITA would have been motivated to configure/design the modified *Spain-I* system/processes to operate in scenarios where the first MU user operated a different/second mobile device to measure signal strengths at a user chosen location and provide such information to a remote server (*e.g.*, location server 30 or other server) for building the fingerprint database. (Ex-1002, ¶190.) Alternatively, or in addition to, the different/second MU would have been operated by a different user to measure signal strengths at the user chosen location for building the database, while allowing other MUs to likewise provide additional measurements for refining the database. (*Id.*) Such features would have leveraged use of a remote database (as contemplated by

Spain-I and *Nanda*) that receives strength measurements from other MUs, while still providing for the first MU to perform location determining processes consistent with that discussed for claim 1. (*Id.*; §IX.A.1(b).)

Such modification would have involved known technologies/techniques and thus a POSITA would have had the skills/rationale and reasonable expectation of success to consider/configure/implement such features in the above-described modified *Spain-I* system/processes. (Ex-1002, ¶191.)

4. Claim 4

- a) **The method of claim 1 wherein the chosen location signal strengths and at least one ID originated from a database of geographic locations and corresponding signal strengths and IDs.**

The *Spain-I-Hunzinger-Nanda* combination discussed above (§IX.A.1) discloses and/or suggests this limitation. (Ex-1002, ¶¶192-194.)

Spain-I's MU builds a fingerprint “database” including fingerprints (red—FIG. 9), which includes signal strengths and IDs (yellow/blue) that correspond to geographic locations (purple).

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

501

Fingerprint Database					
No.	Lat.	Long.	Time	Fingerprint	Description
1					
2					
3					
4					
5					
6					
...					
L					

Fig. 10

(Ex-1011, FIGS. 9-10 (annotated), 13:16-14:37, 13:62-64 (“Lat and Long fields indicate the latitude and longitude of the location to which *the fingerprint corresponds*”), 13:64-14:14; Ex-1005, FIGS. 4-5, 5:40-6:61; Ex-1009, FIGS. 9-10, 9:15-10:37; Ex-1010, FIGS. 9-10, 9:10-10:31; Ex-1002, ¶192.)

Given such teachings and the rationale for modifying *Spain-I*’s system/processes in §IX.A.1(b)(ii), a POSITA would have been motivated, and found obvious, to configure the above discussed *Spain-I-Hunzinger-Nanda* system/process such that the chosen location signal strengths and at least one ID (§IX.A.1(b)(ii)(2)) originated from a database of geographic locations and corresponding signal strengths and IDs, complementing the features/goals contemplated by *Spain-I*. (Ex-1002, ¶194; §IX.A.1(b).) *See KSR*, 550 U.S. at 416.

5. Claim 5

- a) **The method of claim 4 wherein the database is stored remotely, and not on the first portable RF**

communication device.

The *Spain-I-Hunzinger-Nanda* combination discloses and/or suggests this limitation. (Ex-1002, ¶¶195-202; §§IX.A.1, IX.A.3-4.) *Spain-I* describes configurations where the fingerprint database may be stored at the location server remotely from the MU. (*Supra* §§IX.A.1(b); IX.A.3; Ex-1011, FIG. 3, 6:9-14, 6:15-30; Ex-1005, FIG. 3, 4:28-58; Ex-1009, 5:22-42; Ex-1010, 5:20-41.) Likewise, *Nanda* teaches/suggests similar features. (Ex-1006, 12:14-31.) (Ex-1002, ¶195.)

Such teachings in context of the rationale/teachings/suggestions for claims 1 and 3-4 (§§IX.A.1, IX.A.3-A.4), would have motivated a POSITA to configure the modified *Spain-I-Hunzinger-Nanda* system/processes such that the MU operates in conjunction with a remote fingerprint database, where the MU generates/provides fingerprint information (signal strengths and ID information) for respective locations to a remote server for storage in a database for subsequent analysis, consistent with that contemplated by *Spain-I* and *Nanda*. (Ex-1002, ¶196.)

A POSITA would have been motivated to consider/implement such features to allow the modified system to work with a remote database that receives fingerprint data from multiple MUs, like that suggested by *Nanda* (Ex-1006, 12:26-29) and discussed for claim 3, thus beneficially expanding the applications of the modified *Spain-I* system/process as discussed above. (Ex-1002, ¶197; §IX.A.3.) A POSITA would have found such modifications obvious for reasons above, and thus had

similar, capabilities, expectation of success, and state-of-art knowledge, as explained above for claims 1 and 3-4 (§§IX.A.1(b)(ii), IX.A.3-IX.A.4), that would have led to configuring the modified *Spain-I* system/processes as recited in claim 5. (Ex-1002, ¶198.)

While a POSITA would have contemplated using, *e.g.*, a remote server (*e.g.*, location server) to perform determining processes as mentioned by *Spain-I* (Ex-1011, 6:9-31 (FIG. 3 configuration)) and *Nanda* (Ex-1006, 12:14-31), a POSITA would have likewise been motivated and found benefit in allowing the MU to perform the determination processes as discussed for claims 1 and 3-4 using signal strength/ID information stored at a remote database, consistent with that known in the art. (Ex-1002, ¶199; §IX.A.1(b), IX.A.3-IX.A.4; Ex-1028, 5:1-62, 6:34-37, 16:42-63; Ex-1032, 1:15-31, 2:48-52, 3:59-4:7.) A POSITA would have recognized advantages in conserving memory/processing resources in the MU that would have otherwise been used to maintain the fingerprint database locally. (Ex-1002, ¶200.) A POSITA would have considered the tradeoffs relating to various design options available to facilitate such a modification (*e.g.*, design constraints, cost, system application considerations, resource use, etc.) to find benefits in such a modification, and thus been motivated to implement them with a reasonable expectation of success, especially in view of *Spain-I*'s contemplated design goals (Ex-1011, 3:34-40, 15:19-29), and understanding that such modification would have involved use of

known technologies/techniques like those taught by *Spain-I-Nanda*. (Ex-1002, ¶¶201-202.) *See KSR*, 550 U.S. at 416.

6. Claim 6

a) The method of claim 4¹⁵ wherein the database is built by a service provider.

The *Spain-I-Hunzinger-Nanda* combination discloses/suggests this limitation. (Ex-1002, ¶¶203-207; §§IX.A.1, IX.A.4.) The analysis for claim 5 explains how/why a POSITA would have found it obvious to configure the modified *Spain-I* system/processes discussed for claims 1 and 4 (§§IX.A.1, IX.A.4) such that the MU operates in conjunction with a remote fingerprint database maintained by a server (e.g., location server 30 or other server) consistent with the teachings of *Spain-I* and *Nanda*. (§IX.A.5; Ex-1011, FIG. 3, 6:9-30; Ex-1006, 12:14-31; Ex-1002, ¶204.)

A POSITA would have had similar rationale for considering such features from *Nanda* and *Spain-I*, as explained above for claim 5 (*id.*; *see also* §IX.A.1(b)(ii)), as well as similar capabilities, expectation of success, and state-of-art knowledge, that would have led to configuring the modified *Spain-I* system/processes with a database built remotely by a service provider server (such as location server 30 operating as a service provider), as claimed. (Ex-1002, ¶205.) Indeed, *Spain-I* discloses that location server 30 may be interested in the location of

¹⁵ Ex-1001 (Certificate of Correction).

the MU for “personalized services” (Ex-1011, 3:12-16), which is consistent with a “service provider,” and *Nanda* teaches configurations where base station controllers or mobile switching center maintain the fingerprint database (Ex-1006, 12:14-31), which a POSITA would have understood to be related to a service provider (*e.g.*, wireless communication services for MUs) (*id.*, 3:58-7:17; Ex-1002, ¶206.) Thus, a POSITA would have been motivated, and found obvious to configure the modified *Spain-I* system/process (as explained for claims 1, 4-5) such that the remote fingerprint database is built by a “service provider” (*e.g.*, a location server 30 providing service(s) for the MU/user), consistent with that contemplated by *Spain-I*, *Nanda*, and known in the art. (Ex-1002, ¶¶206-207; Ex-1011, 3:9-19, 3:34-40, 15:19-29.)

7. Claim 7

- a) **The method of claim 4 wherein the database is built based on multiple locations, where for each location, GPS measurements and signal strength measurements are performed and the IDs of nearby antenna stations of the plurality of antenna stations are recognized.**

The *Spain-I-Hunzinger-Nanda* combination discloses and/or suggests this limitation. (Ex-1002, ¶¶208-214; §§IX.A.1, IX.A.4.)

Spain-I discloses that the longitude/latitude “of the location to which [each] fingerprint corresponds” are included in the fingerprint database. (Ex-1011, 13:56-14:9, FIG. 10 (below); §IX.A.4; Ex-1002, ¶209.)

501

Fingerprint Database					
No.	Lat.	Long.	Time	Fingerprint	Description
1					
2					
3					
4					
5					
6					
...					
L					

Each location (Lat/Long) is associated with a fingerprint containing signal strength measurements and station IDs, as claimed. (Ex-1011, FIGS. 9-10, 13:16-14:9, 14:10-47; §§IX.A.1.) Accordingly, *Spain-I* discloses the database (*e.g.*, FIGS. 9-10) is built based on locations (Lat/Long (green below)) by performing location measurements (Lat/Long) and signal strength measurements (S (yellow)) and recognizing nearby antenna station IDs (station ID (blue)) like that claimed and discussed above. (§§IX.A.1, IX.A.4; Ex-1011, FIGS. 9-10 (below), 4:7-22, 4:42-63, 5:20-60, 13:27-36; Ex-1002, ¶¶210-211.)

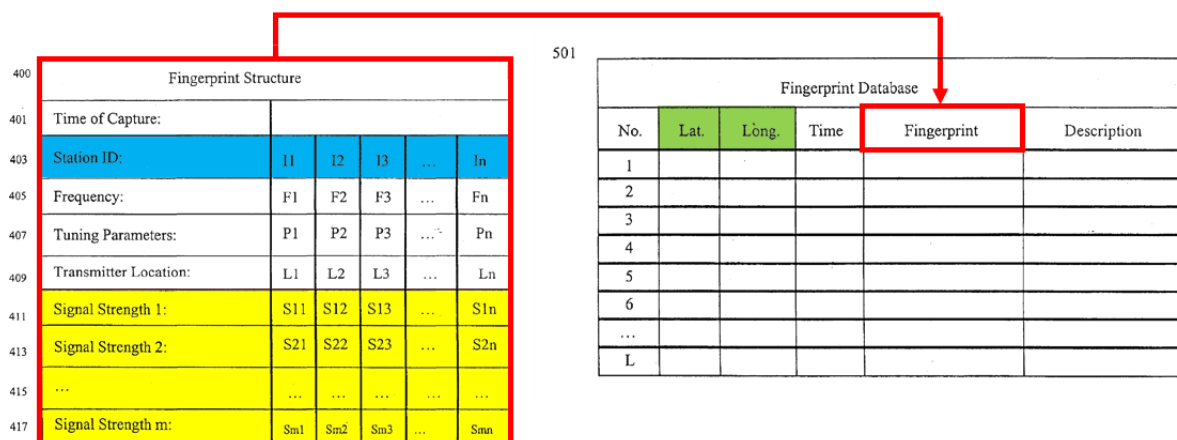


Fig. 9

Spain-I and *Nanda* recognized the known use of GPS receivers in MUs (Ex-1011, 1:45-48, 3:17-40, 4:32-41; Ex-1006, 6:66-7:6; Ex-1001, 9:11-21, 9:47-10:4) and sought processes that complemented/augmented existing location determining technologies (Ex-1011, 3:34-40). A POSITA would have understood from *Spain-I* that the lat./long. fields were obtained by GPS measurements performed for “each location” to build the database given a POSITA understood GPS circuitry/components were known to measure/provide latitude/longitude coordinates for a specific location. (Ex-1002, ¶¶212-213.) (See also §IX.A.1.)¹⁶

Such features (along with others discussed) would have been implemented in the *Spain-I-Hunzinger-Nanda* system/processes for reasons explained above and in

¹⁶ Section IX.C below demonstration how the features in claims 7-10 would have been obvious to the extent not disclosed.

claims 1, 4, such that the system's database was built based on locations, where for each location, GPS and signal strength measurements were performed and surrounding station IDs are recognized, like that claimed. (Ex-1002, ¶214; §§IX.A.1, IX.A.4.)

8. Claim 8

- a) The method of claim 7 wherein at least for some of the locations, signal strength measurements are taken at different times.**

The *Spain-I-Hunzinger-Nanda* combination discloses and/or suggests this limitation. (Ex-1002, ¶¶215-219; §IX.A.7) *Spain-I* discloses configurations where signal strength measurements can be taken at different times. (Ex-1011, 8:3-7 (describing that the database can be constructed by “capturing the fingerprints *at different times...*” and includes the “time at which a fingerprint was captured”), 13:51-56 (signal strength sampled multiple times), FIG. 9 (multiple strength figures), 14:1-2, FIG. 10.) (Ex-1002, ¶216.)

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

501

Fingerprint Database					
No.	Lat.	Long.	Time	Fingerprint	Description
1					
2					
3					
4					
5					
6					
...					
L					

Fig. 10

Nanda also discloses measuring fingerprint values (signal strengths) at “multiple times” for refining a database (Ex-1006, 11:33-56) and *Hunzinger* discloses periodically monitoring a current location (Ex-1054, 4:39-42). (Ex-1002, ¶217.)

Thus, a POSITA would have been motivated, and found obvious, to incorporate such features in the modified *Spain-I* system/processes. (Ex-1002, ¶218; §§IX.A.1, IX.A.4, IX.A.7.) A POSITA would have had similar skills, rationale, knowledge, and expectation of success to implement such features as described above for modifying *Spain-I*'s system/processes in light of *Hunzinger--Nanda* for claims 1, 4, and 7. (*Id.*) A POSITA would have recognized *Spain-I*'s teachings in context of those of *Hunzinger* and *Nanda* to configure the above modified *Spain-I* system/processes to take signal strength measurements at different times to provide a meaningful sampling of signal characteristic data for the fingerprints in the database and/or monitored location, which would further enhance/complement the determining of whether the MU is proximate to a user chosen location as discussed for claim 1. (Ex-1002, ¶¶218-219; §§IX.A.1(b), IX.A.7.)

9. Claim 9

- a) The method of claim 7 wherein the signal strength measurements are taken using a portable RF communication device.**

The *Spain-I-Hunzinger-Nanda* combination discloses and/or suggests this limitation for the same reasons explained for claims 1 and 7 (MU measuring strengths). (Ex-1002, ¶¶220-221; (§§IX.A.1(b)(ii), IX.A.7; Ex-1011, 5:20-32, 13:49-55, 3:55-58.)

10. Claim 10

- a) The method of claim 9 wherein the signal strength measurements or calculation results made using the signal strength measurements, along with the antenna station IDs, are sent by the portable RF communication device to a server responsible for building the database of geographic locations and corresponding signal strengths and antenna stations IDs.**

The *Spain-I-Hunzinger-Nanda* combination discloses and/or suggests this limitation. (Ex-1002, ¶¶222-227; §§IX.A.1, IX.A.4-5, IX.A.7-9.)

The claim 4 analysis demonstrates how the modified *Spain-I* system/processes discloses/suggests chosen location signal strengths and at least one ID originating from a database of geographic locations and corresponding signal strengths and IDs. (§IX.A.4.) The claim 5 analysis demonstrates how/why it would have been obvious for the database to be stored remotely from the first MU, such as a server (*e.g.*, location server 30 or other server). (§§IX.A.3, IX.A.5.) The claim 7 analysis demonstrates how/why the database would have been built based on multiple locations (each including GPS and signal strength measurements and recognized IDs). (§IX.A.7.) For similar reasons, the modified *Spain-I* system/process as configured would have involved the MU sending signal strength measurements (it has taken (claim 9) and station IDs in the fingerprint information to the remote location server that builds/maintains the database, subsequently used for location

determining in accordance with the processes of claims 1, 4-5, 7, and 9. (Ex-1002, ¶¶223-224; Ex-1011, 6:9-31; §§IX.A.1, IX.A.4-A.5, IX.A.7-A.9).)

Thus, in light of the collective teachings of *Spain-I-Hunzinger-Nanda* and the rationale explained above (*id.*), a POSITA would have been motivated to configure the modified *Spain-I* system/processes such that signal strength measurements and station IDs were taken/sent by the MU to a remote server (*e.g.*, location server 30 or another server) configured and responsible for building the database of geographic locations and corresponding signal strengths/IDs, similar to that explained for claims 1, 4-5, and 7-9 and the guidance by *Spain-I*. (*Id.*; Ex-1002, ¶224; Ex-1011, 6:9-31.)

A POSITA would have appreciated the benefits of such modification, including the conservation of MU processing/memory resources that would have been attributed to maintaining the database while maintaining the ability for the MU to perform location-determining using that information accessible from the location server when MU location was desired. (Ex-1002, ¶225.) In certain applications, for similar reasons explained (§IX.A.5), a POSITA would have found advantages in use of a remote server-based database, such as those relating to build the database using measured/collected fingerprint/location data from multiple MUs, providing a more robust database of RF strength, GPS, and ID information, like that suggested by *Nanda* (Ex-1006, 12:26-29) and understood in the art (Ex-1028, 5:10-62). (Ex-1002, ¶225.) A POSITA would have considered the design tradeoffs (costs, resource

load/conservations, etc.) in deciding to implement such modifications as noted above. (Ex-1002, ¶226.)

A POSITA would have had similar skills/rationale/knowledge, and reasonable expectations of success as that described for modifying *Spain-I*'s system/processes discussed above for claims 1, 4-5, and 7-9. (§§IX.A.1, IX.A.4-5, IX.A.7-9; Ex-1002, ¶227.) *See KSR*, 550 U.S. at 416.

11. Claim 26

- a) **The method of claim 1 wherein the determining of part (b) starts taking place or stops taking place at one or more of the following: (i) at specific time intervals, or (ii) at specific times, or (iii) depending on the rate the user's location changes, or (iv) at the occurrence of an event, or (v) upon a request from the network, or (vi) upon a request from a software application on the device, or (vii) upon a request from the user.**

The *Spain-I-Hunzinger-Nanda* combination discloses and/or suggests this limitation. (Ex-1002, ¶¶228-233; §IX.A.1.) *Spain-I* discloses “the determining of part (b) starts taking place or stops taking place...(iv) at the occurrence of an event” because as explained for claim 1, location estimation occurs when the MU or the location server desires location estimation to be performed (an event). (Ex 1011, 4:43-54; §IX.A.1.) Such features would have been implemented in the modified *Spain-I* system/process for reasons similar to those discussed above for modifying *Spain-I* in view of *Hunzinger-Nanda* (*see* §IX.A.1(b) (within proximity of...)). (Ex-1002, ¶229.)

Spain-I also discloses such features “(v) upon a request from the network” because the location server 30 (which is part of the network including the MU) (Ex-1011, FIGS. 1-2) may be interested in whether the MU is at a particular location or not (*id.*, 4:23-25), and can desire a location estimate (*id.*, 4:42-46), which is a request from the network that can cause activation of component 101, fingerprint information capture/generation, and subsequent comparison operations to determine the MU location (*id.*, 4:42-6:14). Such features would have been implemented in the modified *Spain-I* system/process for reasons similar to those discussed above. (*See* §IX.A.1(b) (within proximity of...)) (Ex-1002, ¶230.)

Moreover, it would have been obvious to configure the modified *Spain-I* system/process such that the processes associated with limitation 1(b) “starts” or “stops” “(i) at specific time intervals” or “(iv) at the occurrence of an event,” in light of *Nanda*, which discloses features where location determination processes start at specific time intervals or at the occurrence of an event, similar to that recited in claim 26. (Ex-1006, 5:44-46 (“[W]hen the mobile device 102 periodically awakes...it may also determine its location.”), 10:49-11:32 (mobile device is “controlled” to determine its location (which can be an event))); Ex-1002, ¶231.) In light of such guidance, in context of *Spain-I*’s teachings, a POSITA would have been motivated, and found obvious, to configure the *Spain-I-Hunzinger-Nanda* system/processes discussed for claim 1 such that the location determining processes are initiated at

certain time intervals, such as, for example, where MU software to executes timer functionalities that periodically wakes relevant components in the MU to initiate the disclosed location determination functionalities discussed above for claim 1. (*Supra* §IX.A.1(b); Ex-1002, ¶231.) A POSITA would have been motivated to implement such features, and had a reasonable expectation of success in achieving them, given it would have involved the use of known technologies/techniques (*e.g.*, timers and related features) to predictably provide a MU that periodically checks its location to allow for personalized services to be provided at the appropriate time/location, consistent with the features contemplated by *Spain-I*. (Ex-1011, 3:8-16, 3:34-40, 15:19-29; Ex-1002, ¶231.)

Further, the *Spain-I-Hunzinger-Nanda* combination also discloses/suggests such claimed features “(vii) upon a request from the user” for reasons similar to that explained for claim 1. (Ex-1002, ¶232; §IX.A.1.) As explained, *Spain-I* discloses features where the desire for obtaining a location estimate can originate from the MU (Ex-1011, 4:43-47; Ex-1005, 3:29-31) and where a MU user can generate such a request (Ex-1011, 6:9-21; Ex-1005, 6:43-46), which initiates the location determining processes (Ex-1011, 6:20-30; Ex-1005, 6:46-47). (§§IX.A.1(pre)-1(b)(ii)(3).) For reasons similar to that explained for limitation 1(b), a POSITA would have had the knowledge, skills, and rationale to configure, with a reasonable expectation of success, the modified *Spain-I* system/processes such that the MU

receives requests from a user to generate fingerprints at specific locations (§IX.A.1(b)(ii)(2)), but also to start location determining operations as explained for limitation 1(b), consistent with *Spain-I*'s design goals. (Ex-1002, ¶¶232-233; §IX.A.1(b)(ii)(2); Ex-1011, 3:34-40, 5:55-6:31, 15:19-35; Ex-1006, 8:29-36; *id.*, FIGS. 2-3B, 9:65-10:7.)

B. Ground 2: Claims 3 and 5-6 are obvious over *Spain-I* in view of *Hunzinger, Nanda, and Damarla*

1. Claim 3

To the extent *Spain-I-Hunzinger-Nanda* does not disclose/suggest claim 3 (§IX.A.3), such features would have been obvious in further view of *Damarla*. (Ex-1002, ¶¶234-243.) While *Spain-I*'s teachings (MU user initiating location estimation) in view of *Nanda* would have motivated configuring the modified system/process to including second MU measurements (as discussed in §IX.A.3), a POSITA would have been further motivated to provide updated accurate measurements for the database in view of *Damarla*. (Ex-1002, ¶¶235-236.)

Damarla discloses RF fingerprinting technologies/techniques (Ex-1028, Abstract, FIG. 4 (below)) and is in the same technical field as the '583 patent and *Spain-I-Hunzinger-Nanda* and pertinent to problem(s) addressed by the '583 patent (and a POSITA). (§IX.A.1(pre)-(b)(ii); Ex-1001, 1:23-10:25, 3:26-35, 5:14-56; Ex-1028, 1:10-4:20), and thus would have been consulted in context of *Spain-I-Hunzinger-Nanda*. (Ex-1002, ¶¶237-238.)

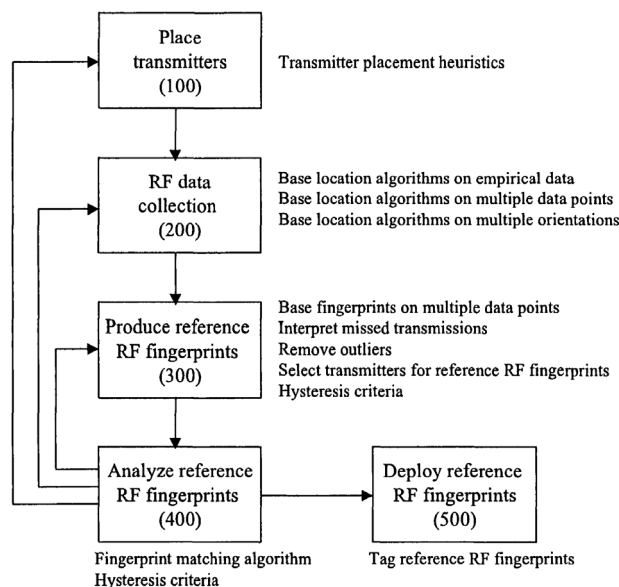


Figure 4

As a part of a fingerprint update process, *Damarla* discloses repeating an RF data collection step wherein “[a]n MU [mobile unit] is taken to various planned locations.” (Ex-1028, FIG. 4, 5:10-16, 5:63-6:1; Ex-1002, ¶¶239-240.) The MU samples/records “the RF environment (*e.g.*, signal strength of transmissions from various sources)” at each location to address environment changes and improve accuracy of a location system. (*Id.*; Ex-1028, 5:10-16, FIG. 4.) Thereafter, updated reference fingerprints are deployed to the MUs for location determinations. (Ex-1028, 5:10-62, 6:13-37, 11:52-12:13, 14:22-23, 16:57-58; Ex-1002, ¶240.) Thus, a first MU can use fingerprint matching to determine location based on database information updated by signal strength measurements taken by a second MU. (*Id.*)

In light of the additional guidance by *Damarla*, a POSITA would have found obvious to configure the *Spain-I-Hunzinger-Nanda* system/processes such that

chosen location signal strengths (§IX.A.1(b)(ii)(2)) were updated in the fingerprint database based on signal strength measurements taken by a second device. (§IX.A.1(b); Ex-1002, ¶241; Ex-1011, FIGS. 9-10; Ex-1028, 5:10-6:1.) A POSITA would configured such modifications based on the desired application of the above-discussed *Spain-I-Hunzinger-Nanda* system/processes. (*Id.*; §§IX.A.1(b), IX.A.3.) For example, in one configuration, the *Spain-I-Hunzinger-Nanda-Damarla* modified system/processes would have been designed to allow the first MU to maintain a fingerprint database and allow a second MU to share with the first MU measured strength information for user chosen locations (as discussed) so that the first MU's fingerprint database is updated with additional fingerprint information corresponding to such chosen location(s), consistent with *Damarla*'s teachings. (Ex-1002, ¶¶241-242.)

Such modification(s) would have beneficially improved the accuracy/confidence/versatility of determined locations (wider set of fingerprints from different MUs) and promoted updating due to changing RF propagation environments, as suggested by *Damarla*. (Ex-1028, 1:62-2:13, 5:63-6:1; Ex-1002, ¶242.) Moreover, in some applications contemplated by a POSITA, such modification(s) would conserve resources (*e.g.*, otherwise used by first MU processes/memory for strength measurements). (Ex-1028, 5:10-6:1; §IX.B.2; Ex-1002, ¶242.)

For reasons above, and in §IX.A.3, a POSITA would have had the skills/rationale/knowledge to configure/implement such modifications (involving known technologies/techniques), with a reasonable expectation of success. (Ex-1002, ¶243; §IX.A.1(b); IX.A.3; IX.B.2.) *KSR*, 550 U.S. at 416.

2. Claims 5-6

Damarla further discloses configurations where “a server that hosts the” fingerprint database, which “could send the appropriate reference RF fingerprints to a MU” “for use at run-time” (Ex-1028, 16:42-57, 5:57-62), consistent with those from *Spain* and *Nanda*. (Ex-1002, ¶245; Ex-1011, 4:43-46).

The additional teachings of *Damarla* would have complemented the rationale for modifying/configuring *Spain-I-Hunzinger-Nanda* system/processes as discussed in §§IX.A.1, IX.A.5-IX.A.6. (Ex-1002, ¶¶244-245.) Thus, *Spain-I-Hunzinger-Nanda-Damarla* discloses/suggests claims 5-6 for reasons in §§IX.A.1, IX.A.4-6, IX.B.1. (*Id.*, ¶246.) A POSITA would have had similar rationale/skills/knowledge and expectation of success as respectively discussed above for claims 5-6 (§IX.A.5-6) (and in §IX.B.1) to configure/implement features like those in claims 5-6 in light of *Damarla*, *Spain-I*, and *Nanda*. (Ex-1002, ¶¶246-247.)

C. Ground 3: Claims 7-10 are obvious over *Spain-I* in view of *Hunzinger, Nanda, and Hour*

1. Claim 7

To the extent the *Spain-I-Hunzinger-Nanda* combination does not disclose the GPS measurement related features of claim 7, a POSITA would have found it obvious to implement them in light of *Houri*. (Ex-1002, ¶¶248-263.) As explained, *Spain-I* discloses generating/storing lat./long. coordinates for each location of each fingerprint in the database and known use of GPS mechanisms in a MU. (§IX.A.7; Ex-1011, 1:45-48, 3:17-40, 4:32-41, 13:16-14:31, FIGS. 9-10; Ex-1002, ¶¶251-253.)

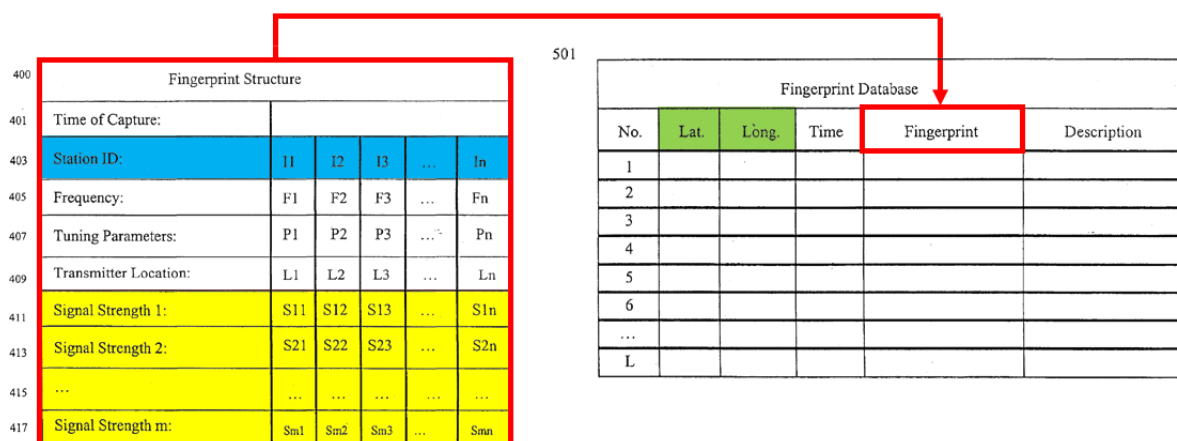


Fig. 9

Such teachings and suggestions would have led a POSITA to consider teachings in the art regarding features for obtaining geographical coordinate information like that considered by *Spain-I*. In doing so, such a skilled person would have found *Houri* to be a source of such guidance. (Ex-1002, ¶254.)

Houri discloses location determining processes/systems that include obtaining signal strength and GPS measurements to build a database. (Ex-1032, Abstract, 1:15-31, 3:23-4:26, 4:59-67, 5:59-6:13; Ex-1002, ¶255.) For instance, a mobile device (including a scanner 18) may be “equipped” with a GPS device that obtains readings regarding the position of the scanner (and thus the device it is in) and also measures the signal strength of beacon signal(s) received at this position. (Ex-1032, 3:23-27, 5:59-64.) The scanner itself may be a PDA/cell phone with software for analyzing the signal received from every beacon at different positions and estimating a geographic location thereof. (*Id.*, 5:64-6:4, 6:38-39.) The readings reflect data sets “designated (Xi, Yi, Si) where Xi and Yi are the latitude and longitude, respectively of the position of the scanner 18 and Si is the strength of a signal received at this position from wireless beacon 28.” (*Id.*, 6:5-14, FIG. 3.) The readings “may be stored in the scanner’s memory.” (*Id.*, 6:14-17.) At each scanner position, multiple readings can be obtained, one for each beacon 28 in reception range of the scanner 18, which “can be stored with an identification of the beacon 28 so that readings can later be combined with other readings from the same beacon...to determine the location of the beacon 28.” (*Id.*, 6:23-29; *id.*, 3:59-67, 4:59-67, FIG. 2; Ex-1002, ¶¶256-257.) Thus, *Houri* discloses the well-known use of a GPS technologies in a mobile device that measures GPS information, which can be associated with signal strengths and stored in memory. (*Id.*) While *Houri* uses

positional information to build a database of beacon locations, *Houri* describes features where the mobile unit (with a scanner equipped with GPS) performs GPS measurements (providing latitude and longitude data) and signal strength measurements and obtaining identifier information of antenna stations in reception range. (Ex-1002, ¶257.)

Houri thus discloses technologies/techniques in the same technical field as the '583 patent and like *Spain-I-Hunzinger-Nanda*, discloses features reasonably pertinent to problem(s) addressed by the '583 patent (and a POSITA). (§§IX.A.1, IX.A.4-5 (*Nanda-Hunzinger-Spain-I*); Ex-1001, 1:23-10:25, 3:26-35, 5:14-37, 5:54-56; Ex-1032, 1:15-4:26, 4:59-67, 5:59-6:13.) Thus, such teachings would have been consulted in context of *Spain-I-Hunzinger-Nanda*. (Ex-1002, ¶258.)

Based on *Houri*'s teachings/suggestions in context of *Spain-I-Hunzinger-Nanda* (§§IX.A.1, IX.A.4, IX.A.7; Ex-1002, ¶¶251-254), a POSITA would have been motivated, and found obvious, to configure the *Spain-I-Nanda* process/system such that the MU includes GPS circuitry/components to perform GPS measurements along with signal strengths and recognized IDs used to build the database with corresponding locations as contemplated by *Spain-I* and *Houri*. (Ex-1002, ¶259; Ex-1011, 1:21-49, 3:17-41.) A POSITA would have been motivated to include GPS measurements in building the database used in the modified *Spain-I* system, as suggested by *Houri*, in order to ensure that the database associates

measured/collected fingerprint information (signal strengths/IDs) with accurate locations measured via GPS as opposed to approximated location data. (Ex-1032, 4:59-67, 5:59-6:13; Ex-1011, 1:28-37; Ex-1002, ¶259.)

A POSITA would have appreciated using GPS measurements to provide the (Lat/Long) location information in the modified system's database would have enhanced accuracy of such location information in the database, thus promoting confidence that the description/geographic location data associated with each fingerprint properly represented where such strength/ID information was measured/collected. (Ex-1011, 1:21-49, 3:17-41, 13:61-14:9; Ex-1002, ¶260.)

The resulting modified system/process would have thus predictably resulted in the MU using conventional GPS technologies/techniques to perform GPS measurements along with the signal strengths measurements and station ID recognition/collection for building the fingerprint database. (*Id.*, ¶¶261-263; Ex-1016, 1:34-43, 10:1-6 (GPS-enabled mobile phone).) Such features would be compatible with the fingerprint-based location-determining processes discussed above for claim 1 given the database was a source of information subsequently used when the MU location was desired while at a monitored location (which can occur in areas where GPS was not available/feasible) (Ex-1011, 1:21-49, 3:17-41, 15:19-29).) (Ex-1002, ¶261.)

A POSITA would have had the skills/rationale/knowledge to configure such modification, with a reasonable expectation of success in implementing features as claimed in the *Spain-I-Hunzinger-Nanda-Houri* system/processes, consistent with the teachings of *Spain-I-Nanda-Hunzinger-Houri* and the state of art at the time. (Ex-1002, ¶¶262-263; Ex-1011, 3:34-40, 15:19-29; Ex-1064, ¶¶0002, 0030, Abstract, FIGS. 1-2; Ex-1016, 1:34-43, 10:1-6.) *See KSR*, 550 U.S. at 416.

2. Claims 8-9

The *Spain-I-Hunzinger-Nanda-Houri* combination discloses/suggests claims 8-9 for reasons explained in §§IX.A.8-IX.A.9, §IX.C.1. (Ex-1002, ¶¶264-272.) A POSITA would have had similar rationale/skills/knowledge and expectation of success as discussed above for claims 8-9 (§§IX.A.8-IX.A.9) and claim 7 (§IX.C.1) to configure/implement features like those of claims 8-9 in light of *Houri* in context of *Spain-I-Hunzinger-Nanda*. (Ex-1002, ¶¶265-268, 270-272.) *See KSR*, 550 U.S. at 416. The additional teachings of *Houri* would have complemented the rationale for configuring the modified *Spain-I* system as discussed. (Ex-1002, ¶¶264, 270.) Such collective teachings/suggestions would have motivated a person of ordinary skill in the art to configure the MU in the *Spain-I-Hunzinger-Nanda-Houri* system/processes to take signal strength measurements at different times for locations in the database to provide a meaningful sampling of signal characteristics

for different locations, thus enhancing/complementing the accuracy of the stored information used for location determining. (*Id.*, ¶¶269, 272; §IX.A.1.)

3. Claim 10

The *Spain-I-Hunzinger-Nanda-Houri* combination discloses/suggests claim 10 for similar reasons above. (Ex-1002, ¶¶273-279; §§IX.A.1, IX.A.4-5, IX.A.10, IX.C.1-2.) That is, for reasons discussed in §IX.A.10 in context of the claims 7-9 analysis above (§§IX.C.1-2), it would have been obvious to configure the *Spain-I-Hunzinger-Nanda-Houri* system/processes in a manner that meets claim 10. (Ex-1002, ¶274.) The additional teachings of *Houri* would have complemented the rationale for modifying/configuring *Spain-I-Hunzinger-Nanda* system/processes regarding claim 10 as discussed. (*Id.*, ¶273.)

A POSITA would have recognized other teachings from *Houri* regarding providing signal strength measurements/IDs to a remote server. (Ex-1002, ¶275.) *Houri* describes features where a mobile device sends identification and signal strength data “to a central monitoring or administration facility” responsible “for providing an accurate database of wireless beacons.” (Ex-1032, 8:4-43, Abstract, 4:59-67, 5:15-6:16, 6:38-52, 7:12-46, 8:11-15; §IX.C.1.) With this data, the facility (as a server) creates/builds a collaborative fingerprint database. (Ex-1032, 8:4-43.) Thereafter, the database information is disseminated to “all wireless computing

devices using the same positioning technique.” (*Id.*; *see also id.*, 7:5-46.) (Ex-1002, ¶275.)

Thus, a POSITA would have been further motivated by *Houri* to configure the *Spain-I-Nanda-Houri* system/processes (§IX.C.1-2) such that the signal strength measurements and station IDs are sent by the MU to a server (*e.g.*, location server 30 or other server) responsible for building the database of geographic locations and corresponding signal strengths and stations IDs for reasons similar to that explained for claim 10 (§IX.A.10) and claims 1, 4-5, and 7-9 (§§IX.A.1, IX.A.4-5, IX.C.1-2), in context of the above-additional teachings from *Houri*. (Ex-1002, ¶276; Ex-1032, 7:12-8:43.)

A POSITA would have had similar skills/rationale, expectations of success and appreciation of resulting benefits/advantages for such a modification as explained for claim 10 in ground 1, complemented with the additional motivations offered by *Houri*’s teachings/suggestions. (Ex-1002, ¶¶277-279; Ex-1032, 8:4-43; §§IX.A.10, IX.C.1-2.) *See KSR*, 550 U.S. at 416.

D. Ground 4: Claims 17-20 and 24-25 are obvious over *Spain-I* in view of *Hunzinger*, *Nanda*, and *Blomqvist*

1. Claim 17

- a) **The method of claim 1 wherein the monitoring step comprises ‘low accuracy monitoring’ and ‘high accuracy monitoring’.**

2. **Claim 18**

- a) **The method of claim 17 wherein ‘low accuracy monitoring’ includes comparing the chosen location IDs with the current location IDs.**

3. **Claim 19**

- a) **The method of claim 18 wherein ‘high accuracy monitoring’ takes place only if the current location IDs are determined to match the chosen location IDs in the ‘low accuracy monitoring’ step.**

4. **Claim 20**

- a) **The method of claim 19 wherein ‘high accuracy monitoring’ includes measuring a signal strength at the current location.**

Spain-I-Hunzinger-Nanda in view of *Blomqvist* discloses/suggests claims 17-20. (Ex-1002, ¶¶280-299.)

As explained for limitation 1(a), the MU extracts parameter information from communication signals received from antenna stations when the MU is at a monitored location, including station ID information and the strength of the received signals. (§IX.A.1(pre)-IX.A.1(a); Ex-1011, 4:43-63; 5:20-6:8, 13:16-14:37; FIGS. 9-10; Ex-1002, ¶283.) The modified *Spain-I* system/processes uses that information to determine whether the MU monitored location is within proximity of a user chosen location. (*Id.*; §IX.A.1(b).)

While *Spain-I-Hunzinger-Nanda* does not describe details concerning low accuracy and high accuracy monitoring as in claims 17-20, their collective teachings

suggest features that would have led a POSITA to consider teachings in the art that would have complimented/enhanced the modified system's operations to conserve resources and make the location determining more efficient, consistent with features contemplated by *Spain-I*. (Ex-1002, ¶¶282-286; Ex-1011, 3:5-17, 4:23-32, 6:32-7:57, 8:27-9:36 (interference compensation, accuracy improvement via learning and dynamic location techniques), 10:1-27 (reduce location search time), 10:29-13:15 (other ways to reduce possible locations for analysis).) A POSITA would have been motivated, and found it obvious, to configure the modified *Spain-I* system/process to implement such low/high accuracy monitoring features, especially in light of *Blomqvist*. (Ex-1002, ¶287; Ex-1011, 6:32-7:57, 8:27-13:15.)

Blomqvist discloses systems/processes for efficiently determining the location of a mobile device. (Ex-1033, Abstract, 1:43-2:16, 2:63-3:12.) *Blomqvist* describes automatically activating a location-based function when it is determined that a mobile device is at or within vicinity of a specified location. (*Id.*, FIG. 2 (below), 1:14-39, 2:20-62, 5:10-60.) (Ex-1002, ¶¶288-289.)

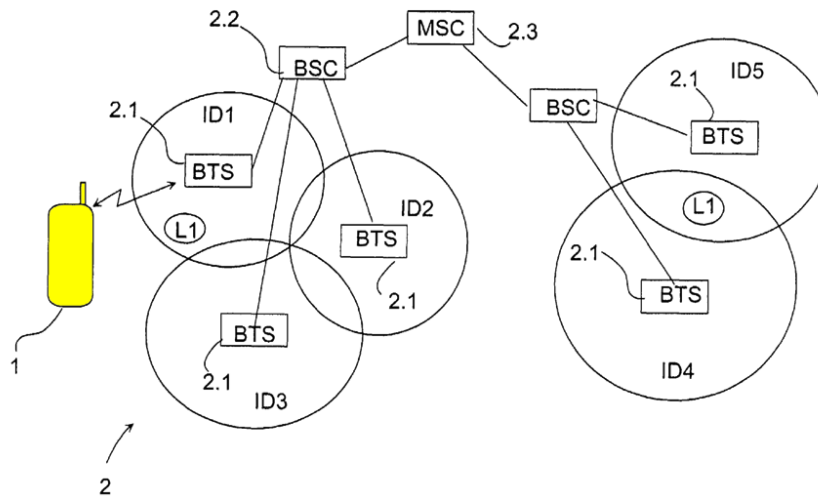


Fig. 2

To reduce the “power consumption,” processing demands, and service positioning costs of a location determination operation, *Blomqvist* discloses monitoring a change in at least one network property as a condition for performing subsequent operations leading to location determination. (Ex-1033, 2:23-27, 2:63-3:12; Ex-1002, ¶290.) For example, a mobile device may perform positioning only when it determines that it moved to a new cell (and corresponding base station), which is determined based on monitoring cell IDs and comparing them to stored IDs. (Ex-1033, 2:27-31, 4:35-60 (program compares cell IDs according to a previously identified base station with IDs of a currently received cell identifier, and if they match (meaning the cell has not changed), “positioning is started”), 6:39-64, 7:19-26.) Such features are consistent with low accuracy monitoring in context of the ’583 patent. (Ex-1002, ¶291; Ex-1001, claims 17-18; 12:14-26.)

Moreover, “[i]f 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.” (Ex-1033, 6:56-61; *id.*, 6:39-7:18, 7:19-26.) *Blomqvist* further discloses that the positioning that occurs after ID matching can vary depending on how a given mobile device determines location (*e.g.*, by processing signals transmitted by several base stations GPS, etc.). (*Id.*, 4:52-5:9.) (Ex-1002, ¶292.)

Blomqvist also describes configurations where signal strength measurements are taken/used for monitoring only after cell ID matching is determined. (*Id.*, 7:43-8:5). Namely, *Blomqvist* discloses first monitoring the “changing of the cell identifier as presented earlier” and “[o]nly at that stage when the device is in the area of such a cell to which a location-based function relates, the results of a signal strength measurement...are utilized to estimate whether the device 1 has moved significantly, and whether it is necessary to conduct new positioning.” (*Id.*) Such features are consistent with high accuracy monitoring, which is performed only when IDs match in context of the ’583 patent. (Ex-1002, ¶293; Ex-1001, (claims 17, 19-20), 12:14-26 (“higher accuracy monitoring activity—which takes the necessary resources to make the necessary determining definitive”); Ex-1033, 2:20-3:19.)

Accordingly, *Blomqvist* discloses technologies/techniques that were reasonably pertinent to problem(s) addressed by the '583 patent (and a POSITA) and is in the same technical field as the '583 patent and *Spain-I-Hunzinger-Nanda*. (§IX.A.1(b) (*Spain-I-Hunzinger-Nanda*); Ex-1001, Abstract, 1:23-10:25, 12:5-26; Ex-1033, 1:14-3:26, 4:35-6:66, 7:43-8:51, 9:6-14.) (Ex-1002, ¶294.)

Given the teachings/suggestions of *Spain-I-Hunzinger-Nanda* in context of *Blomqvist* and a POSITA's state of art knowledge, it would have been obvious to configure the MU of the modified *Spain-I* system/processes to perform low accuracy monitoring and high accuracy monitoring like that recited in claims 17-20. (Ex-1033, 2:63-3:12; Ex-1002, ¶295.) For example, a POSITA would have been motivated and found obvious to configure the MU to receive communication signals from the first antenna stations (limitation 1(a)(i)), identify IDs within the received signals (limitation 1(a)(ii)) and compare the current monitored location IDs with the station IDs for user chosen locations stored in the fingerprint database (*see* §IX.A.1(b)(ii)(2)) to determine whether they match (claims 17-18), similar to features described by *Blomqvist*. (Ex-1002, ¶295.) Similarly, a POSITA would find it obvious to configure the MU to use resources to measure signal strengths from the current monitored location signals only when the IDs matched (claims 17, 19-20), since that would have indicated the MU is receiving signals from relevant

antenna station(s) for the user chosen location(s) fingerprint data stored in the database. (Ex-1002, ¶¶295-296.)

A POSITA would have appreciated the efficiencies—especially in light of *Blomqvist*’s teachings concerning use of signal strength measurements only after cell IDs are checked/matched—associated with first checking whether station IDs match before expending additional resources to measure appropriate signal strengths for use in determining whether the MU is at a specific location as explained for claim 1. (*Id.*; §IX.A.1(a)-(b).)

A POSITA would have been motivated to implement such a configuration in order to conserve MU processing/memory capacities for other uses, reduce power consumption, reduce applicable positioning/service costs, and obtain other well-understood benefits. (Ex-1002, ¶¶295, 298-299; Ex-1033, 2:20-3:19; Ex-1019, ¶¶0185, 0217-0240 (measuring signal strengths, “only when required...to minimize mobile terminal battery drain”); Ex-1055, 3:58-67 (condition-based monitoring to extend device battery life).) Such teachings in context of *Spain-I*, which describes similar staggered and conditioned operations, also would have motivated a POSITA to implement such low accuracy/high accuracy monitoring features like that claimed. (Ex-1002, ¶296; Ex-1011, 4:42-47 (capturing signal information when location estimate is desired), 5:55-65 (discussing how only after the appropriate

signals/parameters are captured/extracted the MU has the basic information for generating the fingerprint).)

A POSITA would have had the skills, knowledge, and rationale to configure/implement the monitoring process with low and high accuracy monitoring just like that recited in claims 17-20, with a reasonable expectation of success in achieving them, especially where they would have involved use of known and predictable techniques/technologies, including programming/modifying the software executed by the MU as contemplated by the prior art. (Ex-1011, 15:19-29; Ex-1033, 8:33-51; Ex-1002, ¶¶297-298.) *See KSR*, 550 U.S. at 416.

In one example, the resulting *Spain-I-Hunzinger-Nanda-Blomqvist* system/processes would have been configured such that the MU performs a modified monitoring step (limitation 1(a)) where extracted current monitored location station IDs are first compared with user chosen location station IDs from the database (low accuracy monitoring (claims 17-18)), and only if the IDs match, move forward with operations to measure the signal strength at the current location (high accuracy monitoring) (claims 17, 19-20) used in the comparison operations consistent with limitations 1(a)(iii) and 1(b). (Ex-1002, ¶¶298-299.)

5. Claim 24

- a) **The method of claim 1 wherein determining if the monitored location is within proximity of a location chosen by the user of the first portable RF communication device further includes informing a**

location-based software program application running on the portable device that the device is at the location chosen by the user or is no longer at the location chosen by the user.

6. Claim 25

- a) **The method of claim 1 wherein determining if the monitored location is within proximity of a location chosen by the user of the first portable RF communication device further includes launching a location-based software program application on the portable device when the device is at the location chosen by the user.**

The *Spain-I-Hunzinger-Nanda-Blomqvist* combination discloses/suggests these limitations. (Ex-1002, ¶¶300-310.) As discussed, the *Spain-I-Hunzinger-Nanda* combination discloses/suggests determining if the monitored location is within proximity of a location chosen by the user of the first MU, as claimed. (Ex-1002, ¶300; §IX.A.1(b).) *Spain-I*'s teachings/suggestions relating to location-based service features (Ex-1011, 3:8-16 ("personalized services")), among others, would have led a POSITA to consider teachings in the art regarding MU-based features/applications that would leverage location information, known at the time. Indeed, based on *Hunzinger* and *Blomqvist* a POSITA would have been motivated, and found obvious, to configure the *Spain-I-Hunzinger-Nanda* system/process such that the above-discussed proximity location determining (§IX.A.1) further includes informing/launching a location-based software program application running on the

MU that the MU is at the location chosen by the user, as in claims 24-25. (Ex-1002, ¶¶300, 307.)

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 user chosen locations. (See §§IX.A.1(b)(ii)(1)-(2).) (Ex-1002, ¶301.)

In addition to above (§§IX.D.1-D.4), *Blomqvist* describes then-conventional mobile device features of activating a location-based function (a reminder, picture/text/sound message, application, etc.) when the device is at or within vicinity of a specified location. (Ex-1033, FIGS. 1a-2, 1:14-39, 2:20-62, 3:44-64, 5:10-6:36, 8:52-62.) For example, 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.) Further, “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.) (Ex-1002, ¶¶302, 308.)

Upon considering *Blomqvist* in context of the *Spain-I-Hunzinger-Nanda* system/processes discussed above for claim 1, a POSITA it would have been motivated and found obvious to configure the MU in the modified *Spain-I* system (§IX.A.1) to include location-based software program applications, such as suggested/taught by *Blomqvist*, that are launched/executed/informed when the device is determined to be at the location chosen by the user like that recited in claims 24-25 (consistent with the teachings of *Hunzinger-Blomqvist*). (Ex-1002, ¶¶303, 308-309.) Providing such notification and execution of location-based applications on a mobile device would have been an obvious implementation of known features, given mobile devices at the time were known to offer applications to assist the user with various tasks, events, and the like based on location (as taught/suggested by *Blomqvist* and *Hunzinger*). (*Id.*) A POSITA would have been motivated to include similar features in the MU of the *Spain-I-Hunzinger-Nanda* system/processes in order to enhance user convenience and assistance regarding certain tasks, such as providing reminders, to-do lists, or provide location-based application when they/MU is determined to be at a given/chosen location, similar to the teachings/guidance offered by *Blomqvist* and *Hunzinger*. (Ex-1033, 1:43-58, 5:10-37; Ex-1054, Abstract; Ex-1002, ¶¶303, 309.) A POSITA also would have

appreciated the benefits of such a modification as it would have enhanced/complemented the features offered by the MU in the *Spain-I-Hunzinger-Nanda* system/processes, including providing user-friendly service-based operations that complemented the service-based features contemplated by *Spain-I*. (Ex-1002, ¶¶304, 309; Ex-1011, 3:8-16.)

A POSITA would have had the skills, knowledge, and rationale to configure/implement the above modifications, with a reasonable expectation of success in achieving them, especially where they would have involved use of known techniques/technologies, including programming/modifying software executed by the MU, consistent with that described by *Spain-I-Hunzinger-Blomqvist*. (Ex-1011, 15:19-29; Ex-1033, 8:33-62; Ex-1054, 3:49-5:22; Ex-1002, ¶¶304, 310.) The collective teachings/suggestions of *Spain-I-Hunzinger-Nanda-Blomqvist* would have predictably led a POSITA to configure the location determining processes performed by the system discussed above such that as part of the determining, the MU informed/launched a location-based application running on the MU as claimed and consistent with features taught by *Blomqvist-Hunzinger*. (Ex-1002, ¶¶305, 310.)
See KSR, 550 U.S. at 416.

X. DISCRETIONARY DENIAL IS NOT APPROPRIATE

Discretionary denial under §325(d) is not appropriate here given this petition does not present the same or substantially the same prior art or arguments previously presented to the Office during prosecution. (Ex-1004; Ex-1001, Cover.) *Advanced Bionics, LLC v. Med-El Elektromedizinische Geräte GMBH*, IPR2019-01469, Paper 6 at 8 (P.T.A.B. Feb. 13, 2020) (precedential). Moreover, there are material differences between the art/arguments here with those during prosecution (Ex-1004, 66-77, 123-132), including features believed to be missing (*e.g.*, threshold) (*id.*, 26, 42, 47, 77, 99-100). (*Supra* §IX; *e.g.*, §IX.A.1(b)(ii)(2)).¹⁷ *Becton, Dickinson & Co., v. Braun Melsungen AG*, IPR2017-01586, Paper 8 (P.T.A.B. Dec. 15, 2017) (precedential as to § III.C.5, first paragraph). And even if PO argues to the contrary, the Office erred in a material manner by allowing the claims despite such features being known. *Advanced Bionics*, Paper 6 at 10-11; *Becton, Dickinson*, Paper 8. (§IX.A.1(b)(ii).)

The *Fintiv* factors do not justify denying institution. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (P.T.A.B. Mar. 20, 2020) (precedential).

¹⁷ Petitioner reserves the right to respond to any discretionary denial arguments that PO may later raise to avoid institution.

The **first factor** (stay) is neutral because Samsung has not yet moved for a stay. *See Hulu LLC v. SITO Mobile R&D IP, LLC et al.*, IPR2021-00298, Paper 11 at 10-11 (P.T.A.B. May 19, 2021).

The **second factor** (proximity) is weighs in favor of institution. The median time from filing to trial in the Eastern District of Texas last year was 24.5 months (Ex-1023, 35),¹⁸ where the court has scheduled jury selection for February 10, 2025 (Ex-1024, 1.) With this petition filed in early November 2023, a FWD may be expected by May/June 2025, not long after the trial date (assuming no delays in the EDTX schedule). (Ex-1022, 9.)

Moreover, the Board has relied on various justifications, such as diligence, a stipulation, minimal investment in litigation, and strong merits of invalidity, which are present here. *Verizon Business Network Services, Inc. v. Huawei Techs. Co.*, IPR2020-01141, Paper 12 (Jan. 14, 2021). This petition was diligently filed in advance of the one-year bar date and just over one month after PO served its infringement contentions. (Exs-1021; 1024, 5; 1025.) Fact discovery is not anticipated to close until September 2024 and expert discovery has not begun (Ex-1024, 3), and the *Markman* hearing will occur August 1, 2024 (*id.*).

¹⁸ 2023 statistics (16.7 mos.) is only to June 30, 2023.

The **third factor** (investment) also weighs against denial. The district court case is in early stages—claim construction briefing does not begin until mid-2024 (*see second factor*; Ex-1024, 3-4) and there have been no substantive orders.

The **fourth factor** (overlap) also weighs against denial. Petitioner hereby stipulates that, if IPR is instituted, Petitioner will not pursue the IPR grounds in the district court litigation. Thus, “[i]nstituting trial here serves overall system efficiency and integrity goals by not duplicating efforts and by resolving materially different patentability issues.” *Apple, Inc. v. SEVEN Networks, LLC*, IPR2020-00156, Paper 10 at 19 (P.T.A.B. June 15, 2020); *Sand Revolution II, LLC v. Continental Intermodal Group-Trucking LLC*, IPR2019-01393, Paper 24 at 12 (P.T.A.B. June 16, 2020).

Petitioner and PO are the same parties as in district court (**fifth factor**), but based on a “holistic view,” the factors favor institution. *Samsung Elecs. Co. Ltd. v. Dynamics Inc.*, IPR2020-00505, Paper 11 at 15 (P.T.A.B. Aug. 12, 2020). Likewise, the compelling merits presented in this petition outweigh any factors that may be determined to lean against institution (**sixth factor**). *See Commscope Tech. LLC v. Dali Wireless, Inc.*, IPR2022-01242, Paper 23 at 4-5 (P.T.A.B. Feb. 27, 2023) (precedential). Especially where the grounds demonstrate/disclose the very features the Office believed were missing during prosecution. (§§VII, IX.A.1(b)(ii).). Moreover, this petition is the **sole** challenge to the claims before the Board—a

“crucial fact” favoring institution. *Google LLC v. Uniloc 2017 LLC*, IPR2020-00115, Paper 10 at 6 (May 12, 2020).

XI. CONCLUSION

Accordingly, Petitioner requests institution of IPR for the challenged claims.

Respectfully submitted,

Dated: November 9, 2023

By: /Joseph E. Palys/
Joseph E. Palys (Reg. No. 46,508)
Counsel for Petitioner

CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that the foregoing petition for *Inter Partes* Review of U.S. Patent No. 8,170,583 contains, as measured by the word-processing system used to prepare this paper, 13,953 words. This word count does not include the items excluded by 37 C.F.R. § 42.24 as not counting towards the word limit.

Respectfully submitted,

Dated: November 9, 2023

By: /Joseph E. Palys/
Joseph E. Palys (Reg. No. 46,508)
Counsel for Petitioner

CERTIFICATE OF SERVICE

I hereby certify that on November 9, 2023, I caused a true and correct copy of the foregoing petition for *Inter Partes* Review of U.S. Patent No. 8,170,583 and supporting exhibits to be served via express mail on the Patent Owner at the following correspondence address of record as listed on Patent Center:

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