Demonstratives of Petitioner Samsung

Inter Partes Review

U.S. Patent No. 8,170,583 (IPR2024-00153)

U.S. Patent No. 8,594,698 (IPR2024-00154)

U.S. Patent No. 10,341,811 (IPR2024-00155)

Oral Hearing: January 21, 2025

SAMSUNG EXHIBIT 1080
Samsung Electronics Co., Ltd. v. Broadphone LLC
IPR2024-00155

IPR2024-00153 - ’583 Patent - Instituted Grounds

- **Ground 1:** Claims 1-10 and 26 obvious in view of *Spain-I*, *Hunzinger*, and *Nanda*

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

- **Ground 3:** Claims 7-10 obvious in view of *Spain-I*, *Hunzinger*, *Nanda*, and *Houri*

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

-00153 Institution Decision at 6-7, 28

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

IPR2024-00154 - ’698 Patent - Instituted Grounds

- **Ground 1:** Claims 1-7, 9-13, 15-16, and 21 obvious in view of *Spain-I*, *Hunzinger*, and *Nanda*

- **Ground 2:** Claims 4 and 6-7 obvious in view of *Spain-I*, *Hunzinger*, *Nanda*, and *Damarla*

- **Ground 3:** Claim 11 obvious in view of *Spain-I*, *Hunzinger*, *Nanda*, and *Budampati*

- **Ground 4:** Claims 15-16 obvious in view of *Spain-I*, *Hunzinger*, *Nanda*, and *Blomqvist*

-00154 Institution Decision at 6-7, 30

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

IPR2024-00155 - ’811 Patent - Instituted Grounds

- **Ground 1:** Claims 1, 8, 14-15, 22, 28 obvious in view of *Spain-I*, *Hunzinger*, and *Nanda*
- **Ground 2:** Claims 4 and 18 obvious in view of *Spain-I*, *Hunzinger*, *Nanda*, and *Blomqvist*
- **Ground 3:** Claims 5 and 19 obvious in view of *Spain-I*, *Hunzinger*, *Nanda*, and *Tiwari*
- **Ground 4:** Claim 24 obvious in view of *Spain-I*, *Hunzinger*, *Nanda*, and *Othmer*
- **Ground 5:** Claim 25 obvious in view of *Spain-I*, *Hunzinger*, *Nanda*, and *Bates*

-00155 Institution Decision at 6, 29-30

Grounds/Claims Disputed by Patent Owner

- **IPR2024-00153, -00154**
  - Whether the combination of *Spain-I*, *Hunzinger*, and *Nanda* renders claims 3 and 5 of the ’583 patent, and claims 4 and 6 of the ’698 patent, obvious.
  - Whether the combination of *Spain-I*, *Hunzinger*, *Nanda, and Damarla* renders claim 5 of the ’583 patent, and claim 6 of the ’698 patent, obvious.
    - NOTE: Claim 3 of the ’583 patent and claim 4 of the ’698 patent are addressed by this combination, but Patent Owner does not present arguments directed to these claims for this ground.

- **IPR2024-00155**
  - Whether the combination of *Spain-I*, *Hunzinger*, and *Nanda* renders claims 14 and 28 of the ’811 patent obvious.

IPR2024-00153 - ’583 Patent - Claims At Issue

3. 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.

5. The method of claim 4 wherein the database is stored remotely, and not on the first portable RF communication device.

IPR2024-00154 - ’698 Patent - Claims At Issue

4. The method of claim 2 wherein the chosen location signal strengths were measured by a second portable RF communication device.

6. The method of claim 5 wherein the database is stored remotely from the first portable RF communications device.

IPR2024-00155 - ’811 Patent - Claims At Issue

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

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

Grounds/Claims Disputed by Patent Owner

- **IPR2024-00153, -00154**
  - **Whether the combination of *Spain-I*, *Hunzinger*, and *Nanda* renders claims 3 and 5 of the ’583 patent, and claims 4 and 6 of the ’698 patent, obvious.**
  - Whether the combination of *Spain-I*, *Hunzinger*, *Nanda, and Damarla* renders claim 5 of the ’583 patent, and claim 6 of the ’698 patent, obvious.
    - NOTE: Claim 3 of the ’583 patent and claim 4 of the ’698 patent are addressed by this combination, but Patent Owner does not present arguments directed to these claims for this ground.

- **IPR2024-00155**
  - Whether the combination of *Spain-I*, *Hunzinger*, and *Nanda* renders claims 14 and 28 of the ’811 patent obvious.

IPR2024-00153 - ’583 Patent

1. 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:

(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

(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.

3. 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.

4. 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.

5. The method of claim 4 wherein **the database is stored remotely**, and not on the first portable RF communication device.

IPR2024-00154 - ’698 Patent

1. A location-determining method, operable by a first portable RF communications device, the method comprising:

(a) the first portable RF communications device monitoring its location by (i) receiving communications signals from a first 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, (ii) identifying at least one ID within at least one of the received communications signals, and (iii) measuring a varying signal characteristic other than ID, which signal characteristic is associated with a received communications signal from each of the first plurality of antenna stations; and

(b) the first portable RF communications device **determining** if a first monitored location, monitored in accordance with part (a), is within proximity of a location chosen by a user of the first portable RF communications device, **as a result of** electronically comparing (i) the at least one ID at the first monitored location with at least one ID at the location chosen by the user and (ii) at least one number based on the varying signal characteristic of the communications signals from each of the first plurality of antenna stations at the first monitored location with **at least one number based on corresponding varying signal characteristics of the communications signals from each of the first plurality of antenna stations at the location chosen by the user**.

2. The method of claim 1 wherein the characteristic is the communications **signal’s strength**, which varies over a range of an antenna station.

4. The method of claim 2 wherein the **chosen location signal strengths were measured by a second portable RF communication device**.

5. The method of claim 2 wherein the chosen location signal strengths and the at least one ID originated from **a database** of geographic locations and corresponding signal strengths and IDs.

6. The method of claim 5 wherein **the database is stored remotely** from the first portable RF communications device.

Ground 1 (*Spain-I, Hunzinger, Nanda*): Claim 1

In addressing claim 1's determining step, the Petition analyzed key teachings of *Spain-I*, *Hunzinger*, and *Nanda*.

- *Spain-I*
  - Describes generating/storing in a database fingerprints corresponding to selected location(s). Ex. 1011, FIG. 9, 3:42-4:63, 5:20-6:31, 7:58-8:26, 13:16-14:37.
  - Discloses configurations where a user can initiate a request that causes "the MU [to] capture[] the fingerprint of its current location." *Id.*, FIG. 3, 6:9-30, 6:43-47.
  - Discloses comparing the "generated fingerprint," which may include "signal strength" parameters, with "the fingerprints in the database" and choosing the MU location as the one corresponding to the "closest" matching fingerprint in the database. *Id.*, 4:55-63, 5:66-6:14.
- *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.
  - 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. *Id.*, 3:49-60, 4:21-57. Location information includes "station ID," "signal conditions," "signal strength," etc. *Id.* at 4:1-12, 6:37-49, 7:9-22.
- *Nanda*
  - 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, 2:16-59, 3:48-4:14, 5:50-7:28.
  - 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, FIG. 2.
  - Discloses storing previously monitored location information (IDs/signal strength). Ex-1006, 8:29-55, 8:56-9:13, 9:31-10:13. The device may "calculate a fingerprint for its current location and compare it" to the stored information. *Id.* at 9:17-20, 10:14-25.

The Petition explained how the determining step was met regardless of where fingerprint data is stored.

-00153 Petition at 11-41; -00153 Reply at 5-6; -00154 Petition at 12-41; -00154 Reply at 5-6

Ground 1 (*Spain-I, Hunzinger, Nanda*): Claims 3, 5 (-00153) / Claims 4, 6 (-00154)

3. 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.

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.)

-00153 Pet. at 42

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

-00153 Pet. at 43

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

-00153 Pet. at 44

***See also* -00153 Ex. 1002 at ¶¶ 185-191; -00154 Petition at 42-45; -00154 Ex. 1002 at ¶¶ 184-190**

Ground 1 (*Spain-I, Hunzinger, Nanda*): Claims 3, 5 (-00153) / Claims 4, 6 (-00154)

Nanda Discloses Creating/Maintaining a Robust Database of Fingerprint Information Using Measurements From Multiple MUs

In the above examples, the mobile device generates the fingerprints and stores a fingerprint database. However, some or all of the fingerprints may alternatively be stored somewhere further up the wide area wireless communication network such as a database **111** accessible by the MSC **110**. In this instance, the processing requirements and storage requirements may be reduced for the mobile device. In operation, the mobile device would create a current fingerprint and transmit that fingerprint to the MSC (or BSC possibly if the database was there). The MSC would then perform the fingerprint comparison and instruct the mobile device whether or not to search for an access point beacon signal. In this arrangement, the MSC could receive fingerprints from multiple mobile devices and have a much larger database of available access points than would be found in a single mobile device. Alternatively, a personalized fingerprint database may

Ex. 1006 at 12:14-31

Ground 1 (*Spain-I, Hunzinger, Nanda*): Claims 3, 5 (-00153) / Claims 4, 6 (-00154)

5. 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.)

-00153 Pet. at 47

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

-00153 Pet. at 47

See also **-00153 Ex-1002 at ¶¶ 195-202; -00154 Ex-1002 at ¶¶ 194-201**

Ground 1 (*Spain-I, Hunzinger, Nanda*): Claims 3, 5 (-00153) / Claims 4, 6 (-00154)

5. The method of claim 4 wherein the database is stored remotely, and not on the first portable RF communication device.

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.)

-00153 Pet. at 48

Reference RF fingerprints must be stored in some form of database. They are most likely stored in the infrastructure, but could be stored on the MUs themselves. Considerations include whether the same MUs are always used in the same physical environment, how much data must be stored vs. how much storage capacity MUs have, and how often the data changes.

Reference RF fingerprints must be matched against MU RF fingerprints. This may or may not be performed by the same processing unit that stores the reference RF fingerprint database; however, processing units could also dynamically transmit portions of the database for use at run-time (e.g., a server that hosts the database could send the appropriate reference RF fingerprints to a MU so that it could do fingerprint matching). Fingerprint matching could be performed by a MU or infrastructure. Considerations include how much processing power is required for fingerprint matching, how many units require fingerprint matching, and how much data must be exchanged over the wireless environment (e.g., to transmit the results of matching or portions of the database).

Ex. 1028 at 16:42-63

See also -00153 Ex. 1002 at ¶¶ 195-202; -00154 Petition at 47-48; -00154 Ex. 1002 at ¶¶ 194-201

Ground 1 (*Spain-I, Hunzinger, Nanda*): Claims 3, 5 (-00153) / Claims 4, 6 (-00154)

Patent Owner's Argument Regarding Drawbacks Is Misplaced

- Patent Owner's expert, Dr. Cooklev, conceded certain advantages to the combination.
  - "Q: So you agree that reducing processing requirements and reducing storage requirements are two separate benefits for storing the fingerprint database on the server, correct? A: I think I agree with that." Ex-1079 at 93:14-18.
- Even if moving the fingerprint database to a remote server may increase bandwidth and/or power consumption, there would still be a beneficial decrease in processing requirements for the MU and reduced storage requirements at the MU.
  - *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) ("[A] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.").
  - *Winner Intern. Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000) ("The fact that the motivating benefit comes at the expense of another benefit, however, should not nullify its use as a basis to modify the disclosure of one reference with the teachings of another.").

Grounds/Claims Disputed by Patent Owner

- **IPR2024-00153, -00154**
  - Whether the combination of *Spain-I*, *Hunzinger*, and *Nanda* renders claims 3 and 5 of the ’583 patent, and claims 4 and 6 of the ’698 patent, obvious.
  - **Whether the combination of *Spain-I, Hunzinger, Nanda, and Damarla* renders claim 5 of the ’583 patent, and claim 6 of the ’698 patent, obvious.**
    - NOTE: Claim 3 of the ’583 patent and claim 4 of the ’698 patent are addressed by this combination, but Patent Owner does not present arguments directed to these claims for this ground.

- **IPR2024-00155**
  - Whether the combination of *Spain-I*, *Hunzinger*, and *Nanda* renders claims 14 and 28 of the ’811 patent obvious.

Ground 2 (*Spain-I*, *Hunzinger*, *Nanda*, and *Damarla*): Claim 5 (-00153) / Claim 6 (-00154)

The Petition Relied on *Damarla*

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.*)

-00153 Pet. at 62

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.)

-00153 Pet. at 63

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).

-00153 Pet. at 64

-00153 Pet. at 61-64; -00153 Ex. 1002 at ¶¶ 234-247; -00154 Petition at 64-67; -00154 Ex. 1002 at ¶¶ 230-243

Ground 2 (*Spain-I*, *Hunzinger*, *Nanda*, and *Damarla*): Claim 5 (-00153) / Claim 6 (-00154)

Damarla Provides Additional Motivation for the Combination

When satisfied with the results of the analysis, the reference RF fingerprints are deployed **500** to the computing infrastructure used to support location determination in the environment. This infrastructure could be a server that delivers reference RF fingerprint information to MUs, or it could be the MUs themselves.

Ex. 1028 at 5:57-62

Reference RF fingerprints must be stored in some form of database. They are most likely stored in the infrastructure, but could be stored on the MUs themselves. Considerations include whether the same MUs are always used in the same physical environment, how much data must be stored vs. how much storage capacity MUs have, and how often the data changes.

Reference RF fingerprints must be matched against MU RF fingerprints. This may or may not be performed by the same processing unit that stores the reference RF fingerprint database; however, processing units could also dynamically transmit portions of the database for use at run-time (e.g., a server that hosts the database could send the appropriate reference RF fingerprints to a MU so that it could do fingerprint matching). Fingerprint matching could be performed by a MU or infrastructure. Considerations include how much processing power is required for fingerprint matching, how many units require fingerprint matching, and how much data must be exchanged over the wireless environment (e.g., to transmit the results of matching or portions of the database).

Ex. 1028 at 16:42-63

-00153 Pet. at 61-64; -00153 Ex. 1002 at ¶¶ 234-247; -00154 Petition at 64-67; -00154 Ex. 1002 at ¶¶ 230-243

Ground 2 (*Spain-I*, *Hunzinger*, *Nanda*, and *Damarla*): Claim 5 (-00153) / Claim 6 (-00154)

Patent Owner Neglects to Address *Damarla*

- Patent Owner argues that Ground 2 does not show obviousness of claim 5 of the ’583 patent and claim 6 of the ’698 patent, but fails to address *Damarla*.
- Patent Owner’s expert, Dr. Cooklev, similarly fails to address *Damarla*.

-00153 Reply at 18-24; -00154 Reply at 18-23

Grounds/Claims Disputed by Patent Owner

- **IPR2024-00153, -00154**
  - Whether the combination of *Spain-I*, *Hunzinger*, and *Nanda* renders claims 3 and 5 of the ’583 patent, and claims 4 and 6 of the ’698 patent, obvious.
  - Whether the combination of *Spain-I*, *Hunzinger*, *Nanda, and Damarla* renders claim 5 of the ’583 patent, and claim 6 of the ’698 patent, obvious.
    - NOTE: Claim 3 of the ’583 patent and claim 4 of the ’698 patent are addressed by this combination, but Patent Owner does not present arguments directed to these claims for this ground.

- **IPR2024-00155**
  - **Whether the combination of *Spain-I*, *Hunzinger*, and *Nanda* renders claims 14 and 28 of the ’811 patent obvious.**

IPR2024-00155 - ’811 Patent

1. A method of determining whether a portable RF communications device is present at a device-specific target location, the method comprising:

with the portable RF communications device automatically:

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

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

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

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

IPR2024-00155 - ’811 Patent

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

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

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

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

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

IPR2024-00155 - Claim Construction

- Regarding the "device-specific target location" term, Broadphone argues:
  - "As explained by Dr. Cooklev [Broadphone's expert], the plain meaning requires a target location that is specific to a particular device, not a location that is generally applicable to numerous devices." -00155 POR at 5.

- Broadphone's interpretation of the claim term should be rejected because it is vague and, to the extent capable of being understood, inconsistent with the intrinsic record. -00155 Reply at 1-5.

-00155 Reply at 1-5

IPR2024-00155 - Claim Construction

Broadphone's Construction Has Numerous Problems

- It is unclear what type of location Broadphone is referring to when it refers to a location that is "specific to a particular device" and that is not "generally applicable to numerous devices."
- Under Broadphone's construction:
  - A user-selected location may or may not be a device-specific target location. Ex. 1079 at 51:9-54:9.
  - Whether two different devices can share the same device-specific target location "depends" on unknown factors. *Id*. at 109:7-21.
  - Unclear what constitutes "numerous devices." *Id*. at 110:16-112:16, 113:12-22.
  - Unclear how a location can be "specific to a particular device." *Id*. at 114:5-116:22, 123:4-124:14.
- Dr. Cooklev was unable to provide a single example of a target location that is specific to a particular device under his understanding. *Id*. at 117:5-122:13.
- Dr. Cooklev repeatedly asserted that the boundaries of the claim element are not "crisply defined." *Id.* at 120:3-8, 120:14-15, 121:4-11, 146:21-147:1.

-00155 Reply at 2-3

IPR2024-00155 - Claim Construction

The Specification Makes Clear a Device-Specific Target Location Can Apply to More Than One Device

substantially equivalent to a current location. The device needs a means for remembering this signal strength (preferably with the antennas' IDs), and this means may be on the device per se, kept at a remote storage (or even transferred from the current device to the owner's next cell phone). The

-00155 Ex. 1001 at 7:2-6

Simply stated, if a mobile telephone (at a user selected location) measures a plurality of service antenna signals and stores these with their respective service antenna identifications, then that mobile telephone (or an equivalent unit) upon observing an identical list of service antennas with substantially identical respective signal strengths—can reasonably conclude that it is within a predetermined proximity of the original user selected location. We will call the

-00155 Ex. 1001 at 9:7-14

step. Where privacy is of concern then all of the four steps should be performed on a single mobile device. However, in a privacy irrelevant shared data environment, one might even reach the case where Registering is done on a first device, Monitoring is done on a second device, Storing is done in an offsite facility, and Determining is done in a different offsite facility.

-00155 Ex. 1001 at 12:53-58

-00155 Reply at 3-4

IPR2024-00155 - Claim Construction

Broadphone's Prosecution History Statements Indicate a Device-Specific Target Location Refers to a User-Selected Location

In short, the method allows a "portable device" to determine whether or not is within the proximity of a "target location" (specific to that device) by comparing currently received signals to signals from antenna stations "identified as being within range of" the "target location." [Page 19, lines 10-13 (A *"mobile telephone (or an equivalent unit) upon observing an identical list of service antennas with substantially identical respective signal strengths-can reasonably conclude that it is within a predetermined proximity of the original user selected location."*)]

-00155 Ex. 1004 at 128

computer or any mobile device ....")] The method operates to determine whether the portable device is located at a "device-specific target location." [Page 27 (*"Determining if the portable RF communications device of the Monitoring step is at the selected location of the registering step by electronically comparing measurements in the monitoring step with the stored at least two measurements of the Recording step."*)]

-00155 Ex. 1004 at 136

-00155 Reply at 4-5

IPR2024-00155 - Claims 14 and 28

The Petition Demonstrated the *Spain-I-Hunzinger-Nanda* Combination Teaches the Device-Specific Target Location of Claims 14 and 28

For example, *Spain-I* explains that when the MU is at a current/monitored location the MU "capture[s] predetermined information from a predetermined portion of the RF spectrum" from stations that are within range of the MU. (Ex-1011, 3:5-16, 4:42-54, 3:55-58, 5:20-22; 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 creates a fingerprint for that current location based on the received signal information, which includes signal strength. (Ex-1011, 6:9-30 (MU capturing

-00155 Pet. at 10

Hunzinger discloses a location determining system/process where a mobile device (with "position location technology") enables a user to choose locations for their specific device and the device performs related actions when it determines it is at such device-specific target locations. (Ex-1054, Abstract, FIGS. 1A-4, 1:38-2:6, 2:10-44, 3:4-67, FIG. 2 (below).) (Ex-1002, ¶132.)

-00155 Pet. at 17

Spain-I's MU performs processes causing a determination whether it is currently "at a particular location or not." (Ex-1011, 4:23-25, 4:43-47; Ex-1005, 3:10-18; §§IX.A.1(pre)-1(a).) The MU electronically compares fingerprint information (including signal strength parameters (*e.g.*, number(s))) for the MU's monitored location first communication signals (§IX.A.1(a)) with stored fingerprint information for particular target location(s) second communication signals (from second antenna stations) to determine a "closest" match. (§§IX.A.1(a), *infra* IX.A.1(b)(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, ¶120.)[7] Thus, the second antenna stations

-00155 Pet. at 13

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, ¶¶69-75, 139-146.)

-00155 Pet. at 21

-00155 Reply at 6-12

IPR2024-00155 - Claims 14 and 28

The Petition Demonstrated the *Spain-I-Hunzinger-Nanda* Combination Teaches the Device-Specific Target Location of Claims 14 and 28

As discussed (§IX.A.1(b)), the MU in the modified *Spain-I-Hunzinger-Nanda* system/processes would have been configured to automatically determine whether the MU monitored location is within proximity of the device specific target location in the fingerprint database. (§IX.A.1(b).) *Spain-I* also describes configurations where the fingerprint database may be stored at the location server remotely from the MU, and the remote server performs comparison operations to "search for the closest matching fingerprint." (*Supra* §§IX.A.1, IX.A.4; Ex-1011, FIG. 3 (below), 6:9-30; Ex-1005, FIG. 3, 4:28-58; Ex-1009, 5:22-42; Ex-1010, 5:20-41.) (Ex-1002, ¶212.)

-00155 Pet. at 58

Likewise, *Nanda* teaches/suggests similar features where a mobile device creates/sends fingerprint(s) to a remote database for location determination processes. (Ex-1006, 12:14-31.) (Ex-1002, ¶212.)

-00155 Pet. at 58

-00155 Reply at 6-12

IPR2024-00155 - Claims 14 and 28

The Petition Demonstrated the *Spain-I-Hunzinger-Nanda* Combination Teaches the Device-Specific Target Location of Claims 14 and 28

In another embodiment, the fingerprint database is stored at the location server and the generated fingerprint (in the mobile unit) is transmitted to the location server over the wireless link. The search for the closest fingerprint is then done in the location server from which it determines the location of the mobile unit.

FIG. **3** depicts the flow of events in this case. A request for position of the mobile unit is generated, as shown in box **301**. The request may be generated by the user carrying the mobile unit, or remotely by the location server. On receipt of the request the mobile unit captures the fingerprint of its current location (box **303**). The captured fingerprint is processed appropriately. Processing may include filtering the fingerprint data and reformatting it to reduce its storage space. Subsequently the fingerprint is transmitted over the wireless link to the location server as shown in box **305**. The location server has a database into which it executes a search for the closest matching fingerprint, as shown in box **307**. Box **309** shows the process culminating in the retrieval of the best matching fingerprint along with its corresponding location. In one embodiment the search also returns a confidence measure that depicts the closeness of the match.

Ex. 1011 (Spain-I) at 6:9-30

-00155 Pet. at 58-60; -00155 Reply at 9-12

IPR2024-00155 - Claims 14 and 28

The Petition Demonstrated the *Spain-I-Hunzinger-Nanda* Combination Teaches the Device-Specific Target Location of Claims 14 and 28

In the above examples, the mobile device generates the fingerprints and stores a fingerprint database. However, some or all of the fingerprints may alternatively be stored somewhere further up the wide area wireless communication network such as a database **111** accessible by the MSC **110**. In this instance, the processing requirements and storage requirements may be reduced for the mobile device. In operation, the mobile device would create a current fingerprint and transmit that fingerprint to the MSC (or BSC possibly if the database was there). The MSC would then perform the fingerprint comparison and instruct the mobile device whether or not to search for an access point beacon signal. In this arrangement, the MSC could receive fingerprints from multiple mobile devices and have a much larger database of available access points than would be found in a single mobile device. Alternatively, a personalized fingerprint database may be created for each user of the wide area wireless communication network and stored at their home system.

Ex. 1006 (Nanda) at 12:14-31

-00155 Pet. at 58-60; -00155 Reply at 9-12

IPR2024-00155 - Claims 14 and 28

Broadphone's Argument Against Claims 14 and 28 Is Based on a False Premise

- Broadphone argues that "the database of locations and fingerprints" of the proposed combination "would be applicable to multiple devices … which directly undermines the Petition's contention that the stored locations would be device-specific." POR at 7.
- But the claims do not require "a database of device-specific locations."
  - The claims require a determination as to "whether [a] portable RF communications device is within proximity of [a] device-specific target location" and doing so by comparing against signal strengths. Ex. 1001 at 26:60-27:5; *see also id.* at 28:18-29.
  - The claims do not say that the signal strengths are device-specific, as Broadphone appears to suggest.

-00155 Reply at 6-7

IPR2024-00155 - Claims 14 and 28

Broadphone's Expert Agreed That Two Devices May Share the Same Device-Specific Target Location

Q So there are situations where two different devices can share the same device-specific target location, correct?

A I think I haven't said it here, but I think it depends.

Q So I asked you whether there are situations where that could be true.

What do you mean by "it depends"?

A I mean, the context of the '811 patent, I think that there could be situations in which that could be true.

Ex. 1079 at 109:7-21

-00155 Reply at 11-12