

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

SAMSUNG ELECTRONICS CO., LTD.,  
Petitioner,

v.

BROADPHONE LLC,  
Patent Owner.

---

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

**PATENT OWNER'S RESPONSE**

## **Table of Contents**

|                                                                                                                                                                                                                               |    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| I. Introduction.....                                                                                                                                                                                                          | 1  |
| II. Background.....                                                                                                                                                                                                           | 2  |
| A. Samsung’s Petition .....                                                                                                                                                                                                   | 2  |
| B. The ’583 Patent.....                                                                                                                                                                                                       | 3  |
| III. Level of Ordinary Skill in the Art .....                                                                                                                                                                                 | 4  |
| IV. Claim Construction.....                                                                                                                                                                                                   | 4  |
| V. Ground 1 fails to show obviousness of claims 3 and 5.....                                                                                                                                                                  | 5  |
| A. Under the Petition’s theory, the “determining” limitation performed by the portable RF communications device. ....                                                                                                         | 5  |
| B. The disclosures that the Petition relies on for claims 3 and 5 teach comparisons performed by a remote server using a database stored on that server. ....                                                                 | 7  |
| C. The Petition provides no motivation, or even any disclosure, of a system where the portable RF communications device performs the comparison despite the data used in the comparison being stored on a remote server. .... | 11 |
| VI. Ground 2 fails to show obviousness of Claim 5.....                                                                                                                                                                        | 14 |
| VII. Conclusion.....                                                                                                                                                                                                          | 16 |

## **PATENT OWNER'S EXHIBIT LIST**

| Ex.  | Description                                                                                              |
|------|----------------------------------------------------------------------------------------------------------|
| 2001 | Email correspondence between the Board and Patent Owner's counsel, dated February 21-22, 2024            |
| 2002 | Email correspondence between Patent Owner's counsel and Petitioner's counsel, dated February 20–26, 2024 |
| 2003 | Declaration of Todor V. Cooklev, PhD.                                                                    |

## **I. Introduction**

The Petition relies on a purportedly obvious combination of three references to construct a system, modeled after the independent claims of the '583 Patent, in which a mobile unit (MU) determines its proximity to a user-selected location by performing certain comparison operations involving location “fingerprints” that were previously made and stored on the MU. For the additional limitation of dependent claim 5, which requires a database of fingerprints “stored remotely,” the Petition contends that a server, rather than the MU, stores a fingerprint database. But the Petition does not and cannot show motivation for the chimeric system formed by the necessary combination of its Claim 1 and Claim 5 theories, where the processing is performed on the MU but the database is stored on a remote server. For at least Ground 1, this defect also applies with equal force to Claim 3. The Petition’s Ground 1 therefore fails to show obviousness of claims 3 or 5, and Ground 2 fails to show obviousness of claim 5. Patent Owner respectfully requests that the Board find claim 5 not unpatentable.

Patent Owner disagrees with the Petition’s invalidity theories as to all claims, but in the interest of streamlining this proceeding focuses solely on claims 3 and 5 in this response.

## **II. Background**

### **A. Samsung's Petition**

Petitioner Samsung Electronics Co., Ltd. (“Petitioner” or “Samsung”) challenges claims 1-10, 17-20, and 24-26 of U.S. Patent No. 8,170,583 (the “’583 Patent”). Petitioner structures its grounds of unpatentability as follows:

- Ground 1: Obviousness of claims 1-10 and 26 over Spain-I in view of Hunzinger and Nanda
- Ground 2: Obviousness of claims 3 and 5-6 over Spain-I in view of Hunzinger, Nanda, and Damarla
- Ground 3: Obviousness of claims 7-10 over Spain-I in view of Hunzinger, Nanda, and Hourie
- Ground 4: Obviousness of claims 17-20 and 24-25 over Spain-I in view of Hunzinger, Nanda, and Blomqvist

All of the Petitioner's theories depend on the premise that a POSITA would be motivated to combine Spain-I, Hunzinger, and Nanda in order to satisfy the limitations of claim 1. Pet. at 5-41. Grounds 2-4 then assert that a POSITA would be motivated to further modify the Spain-I/Hunzinger/Nanda combination in light of separate teachings from Damarla, Hourie, or Blomqvist in order to meet specific limitations of dependent claims. Pet. at 61-82.

## **B. The '583 Patent**

At a high level, the '583 Patent is directed to a method by which a portable radio communication device can determine whether it is located near a location previously chosen by its user. In particular, the '583 Patent claims a two-step process in which the portable device (a) monitors its location by measuring the signal strengths of received communication signals and (b) determines whether it is within proximity of the user's chosen location by comparing IDs and figures based on signal strengths of received signals using a threshold. The '583 Patent also claims a system comprising computer program code to perform such a method.

Claim 1 of the '583 Patent is representative, and recites:

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.

### **III. Level of Ordinary Skill in the Art**

The Petition posits that a POSITA in the field of the '583 Patent “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).... More education can supplement practical experience and vice versa.” Pet. at 3. For purposes of this Response, Patent Owner does not challenge the proposed definition.

### **IV. Claim Construction**

The Petition states that “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 representations.” Pet. at 4-5. For purposes of this Response, Patent Owner agrees that no formal claim construction is necessary.

**V. Ground 1 fails to show obviousness of claims 3 and 5.**

**A. Under the Petition’s theory, the “determining” limitation performed by the portable RF communications device.**

In the Petition’s obviousness theory, the claimed portable RF communications device corresponds to the “MU” (mobile unit) of Spain-I. Pet. at 6, 9, 12. This corresponds, again in the Petition’s theory, with the “mobile device” of Hunzinger (*see* Pet. at 15) and Nanda (*see* Pet. at 21).

Claim 1 of the ’583 Patent includes a step, performed by the claimed first portable RF communication device, of “**determining** if a monitored location is within proximity of a location chosen by a user of the first portable RF communication device.” The Petition identifies this as limitation 1(b).

The Petition presents a single obviousness theory for this “determining” limitation: that the MU itself performs a determination by itself comparing a station ID and at least one figure based on signal strengths. *See* Pet. at 34 (alleging that this limitation would have been obvious because “a POSITA would have been motivated, and found obvious, to configure the above-modified Spain-I system/process... such that *the MU’s location determining processes include comparing at least one station ID and at least one figure based on the signals*

*strengths*”); *see also id.* at 12 (alleging this limitation is present in Spain I because “[t]he *MU* electronically compares fingerprint information (including signal strengths and station ID(s)) for the MU’s current location... with stored fingerprint information... associated with particular location(s) to determine a ‘closest’ match”); *id.* at 19-20 (alleging this limitation is present in Nanda because Nanda’s “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’”).

Moreover, the Petition contends that a POSITA would have been able to “program/configure *the MU* to implement the above-discussed ID/strength comparison and threshold features.” *Id.* at 36. The Petition summarizes its entire “comparing” analysis thus: “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.* at 38. The Petition’s discussion of the claim 1 preamble likewise confirms that the MU itself performs the comparison operation under the Petition’s proposed combination. *Id.* at 7 (“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.’”).

Accordingly, for the Petition’s Ground 1 theory to succeed, Petitioner must show that the mobile device itself would be configured to perform the determination

by comparing signal strength information with stored fingerprint information. There is no suggestion in the context of Claim 1 that a POSITA would be motivated to configure a remote server, or anything other than the MU, to perform the comparison operation. In particular, although Spain-I does disclose a “location server 30,” the Petition specifically avoids that disclosure and instead contends that a POSITA would have been motivated to implement relevant functionalities at the MU. For example, the Petition concedes that while a particular disclosure in Spain-I teaches that “location server 30,” rather than the MU, performs the functionalities “maintaining the fingerprint database and performing fingerprint matching processes,” the Petition contends that Spain-I’s teachings “suggested to a POSITA that *the MU may be configured* to receive user requests to measure/collect other fingerprint locations.” *Id.* at 14.

**B. The disclosures that the Petition relies on for claims 3 and 5 teach comparisons performed by a remote server using a database stored on that server.**

Although the Petition’s Ground 1 theory for Claim 1 contends that a POSITA would have found it obvious to implement the claimed “determining” step by having the mobile device itself perform a comparison between stored fingerprint data and measured signal strengths, the Ground 1 theory for Claims 3 and 5 contends that a POSITA would be motivated to store the fingerprints in a database on a server separate from the MU. The Petition specifically relies on Spain-I’s teaching of

“location server 30” and Nanda’s teaching of a “remote database.” Pet. at 42. Based on these teachings, the Petition contends that a POSITA would have been motivated to “build[] a robust fingerprint database *stored at a remote server*, consistent with features contemplated by Spain-I and Nanda.” *Id.* at 43 (Claim 3). *See also id.* at 47 (contending, in connection with Claim 5, that a POSITA would have been motivated “to configure the modified Spain-I-Hunzinger-Nanda system/processes such that the MU operates in conjunction with *a remote fingerprint database*”).

In other words, the Petition’s claim 1 theory requires the signal strength comparison between stored fingerprint data and measured signal strengths to happen at the MU, but the Petition’s theory for claims 3 and 5 requires the stored fingerprint data be stored *remotely* from the first MU. The Petition, however, articulates no motivation that a POSITA would have had to arrive at such a combination of elements.

As an initial matter, both Spain-I and Nanda specifically teach that when the database is stored on a remote server, *the comparisons are also performed on the remote server*. *See* Ex. 2003 ¶ 34. For instance, Spain-I describes two mutually exclusive embodiments; in the first, the database is stored on the mobile unit and the comparisons are performed at the MU, and in the second, the database is stored at a remote server and the comparisons are performed at the location server:

Once the fingerprint is generated, its association with a certain location has to be determined. According to this invention this is done by

utilizing a fingerprint database that contains a number of fingerprints along with their corresponding location identities. ***In one embodiment the database is stored in the mobile unit.*** The generated fingerprint is compared with the fingerprints in the database and the fingerprint in the database that is closest to the generated fingerprint is selected as the match. The corresponding location in the database is then chosen as the location of the mobile unit. In one embodiment, the search algorithm takes more than one fingerprint from the database that are closest to the generated fingerprint and interpolates the most plausible location for the mobile unit from the locations of the chosen fingerprints.

***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.... [T]he mobile unit captures the fingerprint of its current location (box 303).... 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.

Spain-I at 5:61-6:30. The Petition specifically relies on the second embodiment, where the location determination is performed by the location server. Pet. at 42 (citing Ex-1011, 6:9-30). There is no embodiment in Spain-I, nor any obviousness theory in the Petition, of an embodiment where the database is stored on the location server but the determination operation is performed by the MU. Ex. 2003 ¶ 34.

Nanda likewise teaches an alternative embodiment where both the database storage and the location determination are situated on a remote server. This is

presented in the final non-boilerplate paragraph of Nanda's specification, as an alternative to "the above examples," *i.e.* all of the other embodiments of Nanda:

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 [mobile switching center] 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.

Nanda (Ex. 1006) at 12:14-31. Again, this is the precise embodiment relied on in the Petition, and indeed the only portion of Nanda cited for claim 3. *See* Pet. at 42 (citing Ex-1006, 12:14-31). Likewise, the Petition relies on this same disclosure for claim 5. *Id.* at 47 (cross-referencing claim 3 analysis and citing Ex-1006 at 12:26-29); *see also* Ex. 2003 ¶ 35.

Spain-I and Nanda thus unambiguously disclose that when the fingerprint database is stored on a remote server, it is the ***remote server*** (not the mobile unit) that "determines the location of the mobile unit" (Spain-I at 6:13-14) or "perform[s] the fingerprint comparison" (Nanda at 12:23-24). Ex. 2003 ¶ 36. As explained in the following section, the Petition sets forth no motivation for a POSITA to have stored

the fingerprint database on the remote server but perform the fingerprint comparison on the mobile unit, as required by the Petition's theory for claims 3 and 5.

**C. The Petition provides no motivation, or even any disclosure, of a system where the portable RF communications device performs the comparison despite the data used in the comparison being stored on a remote server.**

The Petition's analyses for claims 3 and 5 does not present any new or alternative theory for the limitations of independent claim 1 upon which each claim depends; thus, they necessarily rely on the same theory as claim 1. As discussed in Section V.A above, the Petition's claim 1 theory requires that the determination of the location of the mobile unit, specifically including the fingerprint comparison, is performed by the MU (the claimed first portable RF communications device). And as discussed in Section V.B above, the Petition's theories for the additional limitations of Claim 3 and 5 exclusively rely on prior art teachings in which the determination of the location of the mobile unit, specifically including the fingerprint comparison, is performed by a remote server, *not* the MU. The Petition, however, does not even *allege* that a POSITA would have been motivated to mix and match these alternative embodiments in this haphazard manner.

The Petition's failure to identify any motivation to pursue this combination of what are explicitly disclosed as alternative embodiments is unsurprising, because a POSITA considering the teachings of Spain-I, Nanda, and Hunzinger would have *avoided* storing the fingerprint database on the server while performing the

fingerprint comparison on the MU. Ex. 2003 ¶ 37. The same paragraph of Nanda that the Petition relies upon recites that the benefit of storing the fingerprint database on the server is to reduce the “processing requirements and storage requirements” for the MU. Nanda at 12:19-20. These benefits come about from the ability of the MU to offload both processing and storage to the server, *e.g.*, if the server performs the location determination, the MU does not need to consume power loading the relevant data into memory and performing comparison operations that may require significant computation. Ex. 2003 ¶ 37. If the determination process is performed by the MU, then the MU must perform at least as much computation as in Nanda’s primary embodiment. *Id.*

A POSITA would thus recognize that moving the database from the MU to the server, without similarly moving the computation to the server, would not reduce the computational load on the MU, and accordingly would not save any power at the MU. Ex. 2003 ¶ 38. Indeed, a POSITA would recognize that storing the database on a server but requiring the MU to perform the determination computation would likely *increase* the power consumption of the MU. *Id.* There must be some facility (not explained in the Petition) to communicate location information between the MU and the server in order to enable the MU to perform computations based on a remote database. *Id.* Such communications would necessarily consume both bandwidth and power, which are precious resources in a wireless communication system. *Id.*

Thus, a POSITA would have readily understood that the Petition's claim 3 and 5 combination would involve two significant drawbacks regarding bandwidth and power consumption. Ex. 2003 ¶ 39. As also noted above, the Petition identifies no motivation to incur such apparent drawbacks.

Indeed, the *only* motivation of record to incur these drawbacks by performing a fingerprint comparison on the MU itself (as opposed to on the remote server the fingerprint database is stored on) is disclosed by the '583 patent itself. Specifically, the '583 patent teaches that having the calculation of location performed by a remote server (such as on a cellular network) poses privacy concerns, and that such concerns can be solved "by having the cell phone itself [rather than the cellular network] monitor its position." Ex. 1001 at 3:15-16; *see id.* at 3:7-9 (explaining that "[f]rom a privacy perspective, having the cellular network constantly monitor a user's location is problematic to many people," and that "the privacy problem could be solved by having the cell phone itself monitor its position"). The Petition fails to allege (much less provide evidence that) a POSITA would have recognized this privacy concern; indeed, the entirety of the Petition and corresponding expert declaration does not even *mention* the word "privacy." Accordingly, there is no evidence that a POSITA would have recognized the privacy problem addressed by the '583 patent.

Accordingly, Ground 1 fails to show the obviousness of Claims 3 or 5.

## **VI. Ground 2 fails to show obviousness of Claim 5.**

The Petition's Ground 2 does not actually explain how or why its combination involving Spain-I, Hunzinger, Nanda, and Damarla satisfies all requirements of claim 1, from which challenged claims 5 depends. *See generally* Pet. 61-64. Instead, the Petition's **only** discussion of how claim 1 is satisfied is provided with respect to a different combination of references (involving only Spain-I, Hunzinger, and Nanda) set forth in Ground 1. Accordingly, while the Petition fails to allege how its Ground 2 theory satisfies the requirements of claim 1 (from which claim 5 depends), Patent Owner assumes for purposes of this response that Petitioner relies on its Ground 1 analysis.

As explained with respect to Ground 1, Spain-I and Nanda are the only references alleged to perform the claimed determination as a result of a comparison of measured IDs and signal strengths (which under the Petition's claim 1 theory would be performed on the mobile device itself). *See* Section V.A, *supra*. And while both Spain-I and Nanda teach that the relied-upon calculation can occur either on a remote server or on the device itself, both references are clear that when the fingerprint database is stored on a remote server, the calculations the Petition alleges satisfy the claim 1 "determining" step would **also** be performed on the remote server rather than on the database itself. *See* Section V.B, *supra*; Ex. 1006 at 12:15-24 ("[S]ome 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 [mobile switching center] 110.... The MSC would then perform the fingerprint comparison.*”); Ex. 1011 at 6:9-13 (“In another embodiment, the fingerprint database is stored at the location server... *The search for the closest fingerprint is then done in the location server....*”).

Furthermore, a POSITA reviewing Nanda and Spain-I would have been motivated to design a system consistent with these disclosures such that the calculations would be performed the remote server on which the fingerprint database was stored, for the reasons discussed above in Section V.C, which is incorporated by reference. As one example, Nanda itself expressly teaches that doing so has the benefit that “processing requirements... may be reduced for the mobile device” (Ex. 1006 at 12:14-25), which a POSITA would have found significant because reducing processing requirements would reduce power consumption and thus increase effective battery life for the mobile device. Ex. 2003 ¶¶ 37-39.

Contrary to these teachings of Nanda and Spain-I, and the motivations of a POSITA, the Petition’s Ground 2 contends that for claim 5, the calculations would be conducted on the mobile device even though the fingerprint database is stored on a remote server. *See* Pet. 64 (alleging that in the combination, there would be “a server that hosts the’ fingerprint database”). The Petition, however, presents no motivation to pursue such an approach, and does not even acknowledge that this

approach is inconsistent with the teachings of both Nanda and Spain-I. *See generally* Pet. 64 (providing only a single paragraph offering conclusory allegations regarding motivation, none of which allegations address this issue).

Just as with the Petition’s Claim 1 analysis, the *only* motivation of record to incur these drawbacks by performing a fingerprint comparison on the device itself (as opposed to on the remote server the fingerprint database is stored on) is disclosed by the ’583 patent itself, which teaches that having the calculation performed on the device solves privacy concerns posed by having a network monitor the device’s location. *See* Section V.C, *supra*; Ex. 1001 at 3:7-9 (explaining that “[f]rom a privacy perspective, having the cellular network constantly monitor a user’s location is problematic to many people,” and that “the privacy problem could be solved by having the cell phone itself monitor its position”). As with Ground 1, the Petition’s Ground 2 analysis fails to show or even allege that a POSITA would have recognized this privacy concern. Accordingly, there is no evidence that a POSITA would have recognized the privacy problem the ’583 patent addresses.

As such, the Petition’s Ground 2 fails to show the invalidity of claim 5 of the ’583 Patent.

## **VII. Conclusion**

For the reasons stated above, Patent Owner respectfully requests that the Board find claim 5 not unpatentable.

Respectfully submitted,

Dated: August 20, 2024

/ Reza Mirzaie /  
Reza Mirzaie (Reg. No. 69,138)  
RUSS AUGUST & KABAT  
12424 Wilshire Blvd, 12th Floor  
Los Angeles, CA 90025  
(310) 826-7474

Attorney for Patent Owner

**CERTIFICATION REGARDING WORD COUNT**

Pursuant to 37 C.F.R. §42.24(d), Patent Owner certifies that there are 3,942 words in the paper excluding the portions exempted under 37 C.F.R. §42.24(a)(1).

Dated: August 20, 2024

/s/ Reza Mirzaie  
Reza Mirzaie

**CERTIFICATE OF SERVICE (37 C.F.R. § 42.6(e)(1))**

The undersigned hereby certifies that the above document was served on August 20, 2024, by filing this document through the P-TACTS system as well as delivering a copy via electronic mail upon the following attorneys of record for the Petitioner:

Joseph E. Palys (Reg. No. 46,508)  
Naveen Modi (Reg. No. 46,224)  
Kevin Stewart (Reg. No. 78,581)  
[PH-Samsung-Broadphone-IPR@paulhastings.com](mailto:PH-Samsung-Broadphone-IPR@paulhastings.com)

Date: August 20, 2024

/ Reza Mirzaie /

Reza Mirzaie (Reg. No. 69,138)  
RUSS AUGUST & KABAT  
12424 Wilshire Blvd, 12<sup>th</sup> Floor  
Los Angeles, CA 90025  
(310) 826-7474

Attorney for Patent Owner