

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner,

v.

GEOSCOPE TECHNOLOGIES PTE. LTD.,
Patent Owner.

IPR2023-01212
Patent 8,406,753 B2

Before PATRICK R. SCANLON, SHEILA F. McSHANE, and
BRIAN D. RANGE, *Administrative Patent Judges*.

McSHANE, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

Google LLC (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of claims 1, 7, 9, 32, 38, and 40 (the “challenged claims”) of U.S. Patent No. 8,406,753 B2 (Ex. 1001, “the ’753 patent”), along with the Declaration of David H. Williams (Ex. 1008). Geoscope Technologies Pte. Ltd. (“Patent Owner”) filed a Preliminary Response. Paper 10. With the Board’s leave, Petitioner filed a Reply (Paper 12) to the Preliminary Response, and Patent Owner filed a Sur-reply (Paper 13).

On February 20, 2024, the Board instituted an *inter partes* review of the challenged claims pursuant to 35 U.S.C. § 314. Paper 14 (“Dec.”).

After institution, Patent Owner filed a Patent Owner Response (Paper 26, “PO Resp”), along with the Declaration of Mr. Mark Alan Sturza (Ex. 2020). Petitioner filed a Reply (Paper 33, “Pet. Reply”), and Patent Owner filed a Sur-reply (Paper 37, “PO Sur-reply”). The parties presented oral arguments at a hearing conducted on November 20, 2024, and a hearing transcript has been entered into the record (Paper 43, “Tr.”).

For the reasons set forth in this Final Written Decision, pursuant to 35 U.S.C. § 318(a), we determine that Petitioner has demonstrated, by a preponderance of the evidence, that claims 1, 7, 9, 32, 38, and 40 of the ’753 patent are unpatentable.

II. BACKGROUND

A. *Related Matters*

The parties identify the following matters as related to this proceeding:

Geoscope Technologies Pte. Ltd. v. Google LLC f/k/a Google Inc., No. 1:22-cv-01331-MSN (E.D. Va.) (filed Nov. 22, 2022) (“Google action”); and

Geoscope Technologies Pte. Ltd. v. Apple Inc., No. 1:22-cv-01373-MSN (E.D. Va.) (filed Dec. 1, 2022).

Pet. 2; Paper 11, 1.

Patent Owner additionally identifies the following matters as related to this proceeding:

Google LLC v. Geoscope Technologies Pte. Ltd., IPR2023-01209, IPR2023-01210, and IPR2023-01211 (PTAB) (filed Aug. 10, 2023);

Google LLC v. Geoscope Technologies Pte. Ltd., IPR2023-01213 (PTAB) (filed Aug. 9, 2023);

Geoscope Technologies Pte. Ltd. v. Google LLC, No. 24-1003 (Fed. Cir.) (docketed Oct. 2, 2023);

Geoscope Technologies Pte. Ltd. v. Apple, Inc., No. 24-1018 (Fed. Cir.) (docketed Oct. 5, 2023); and

Apple Inc. v. Geoscope Technologies Pte. Ltd., IPR2024-00031 and IPR2024-00032 (filed Oct. 31, 2023); and

Apple Inc. v. Geoscope Technologies Pte. Ltd., IPR2024-000255 (PTAB) (filed December 1, 2023); and

Apple Inc. v. Geoscope Technologies Pte. Ltd., IPR2024-000259 (PTAB) (filed December 6, 2023).

Paper 11, 1–2.

B. The '753 Patent (Ex. 1001)

The '753 patent, titled “System and Method for Generating a Location Estimate Using Uniform and Non-Uniform Grid Points,” issued March 26, 2013. Ex. 1001, codes (45), (54). The '753 patent claims priority to Provisional Application No. 60/899,379 (“the '379 provisional application”), filed on February 5, 2007. *Id.*, code (60). The '753 patent “relates to the problem of estimating the location of a wireless mobile device using information from one or more Network Measurement Reports (“NMRs”) . . . generated by a wireless communications network or the mobile device.” *Id.* at 1:15–23. As background, the '753 patent describes “a need to streamline the [location determination] process in order to efficiently and effectively handle the vast amount of data being sent between the wireless communications network and the large number of mobile devices for which locations are to be determined.” *Id.* at 2:22–26. Accordingly, the '753 patent aims to “overcome[] the limitations of the prior art by estimating the location of a wireless mobile device using . . . one or more pre-existing . . . NMRs . . . which include calibration data for a number of locations within a geographic region.” *Id.* at 2:27–31.

The '753 patent explains that the method of the invention includes providing calibration data for points in a geographic region, with the calibration data including characterizing parameters such as a signal strength measurement. Ex. 1001, 51:16–19, 9:59–63. The method further includes receiving at least one Network Measurement Report (NMR) from a mobile device at an unknown location, generating “sets of grid points for the calibration data,” and evaluating the NMRs “with each of the sets of grid points as a function of select ones of the characterizing parameters.” *Id.* at

51:19–27. In the method, “[a] set of grid points . . . as a function of a predetermined criteria” may be selected and the location of the mobile device in the geographic region is determined “as a function of the selected set of grid points.” *Id.* at 51:27–31. Figure 67 of the ‘753 patent, reproduced below, depicts this process.

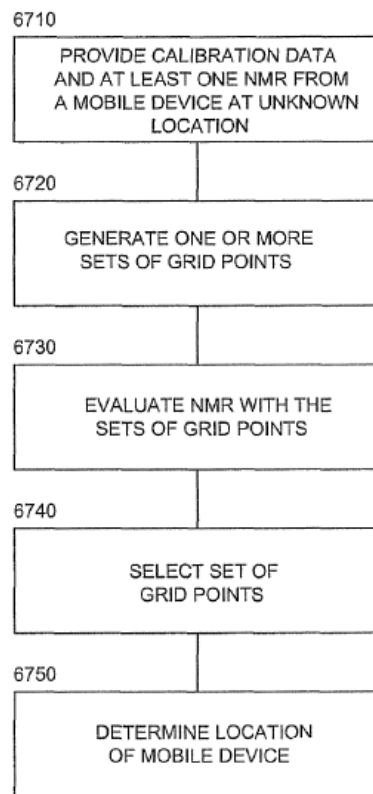


FIG. 67

Figure 67, above, depicts “a flow chart for a method of determining the location of a mobile device in a geographic region according to one embodiment.” Ex. 1001, 51:13–15.

C. The Challenged Claims

Petitioner challenges claims 1, 7, 9, 32, 38, and 40 of the '753 patent. Pet. 6. Claims 1 and 32 are independent claims. Claim 1 is illustrative of the claimed subject matter and is reproduced below, with bracketed designations added for reference purposes.

1. [pre] A method of determining the location of a mobile device in a geographic region comprising the steps of:

[1.1] providing calibration data for each of one or more calibration points in a geographic region, said calibration data having one or more characterizing parameters;

[1.2] generating one or more sets of grid points for said calibration data;

[1.3] receiving at least one network measurement report from a mobile device at an unknown location in said geographic region;

[1.4] evaluating said at least one network measurement report with each of said sets of grid points as a function of select ones of said characterizing parameters;

[1.5] selecting a set of grid points as a function of a predetermined criteria; and

[1.6] determining the location of a mobile device in said geographic region as a function of said selected set of grid points.

Ex. 1001, 59:14–31.

D. Asserted Grounds of Unpatentability

Petitioner asserts the following challenges to patentability:

Claims Challenged	35 U.S.C. § ¹	Reference(s)/Basis
1, 7, 9, 32, 38, 40	102(b)	Spain ²
1, 7, 9, 32, 38, 40	103(a)	Spain, Agiwal ³

Pet. 6.

III. ANALYSIS

A. Level of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art:

would have been someone knowledgeable in wireless networks, cellular radio systems, mobile communication devices and radio navigation systems. That person would have at least a bachelor's degree in electrical engineering, with a background in radio frequency communications and/or navigation system technology as well as approximately two years of industry experience working on radio communication and/or navigation systems.

Pet. 18 (citing Ex. 1008 ¶ 44). Patent Owner adopts Petitioner's asserted level of ordinary skill in the art. PO Resp. 13.

¹ The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. §§ 102, 103, effective March 16, 2013. Because the application and provisional application for the '753 patent were filed before this date, the pre-AIA version of §§ 102, 103 apply. *See* Ex. 1001, codes (22), (60). Petitioner does not dispute that the filing date of the provisional application filing date applies. *See* Pet. 6; *see generally* Pet. Reply.

² US 2003/0064735 A1, published April 3, 2003 (Ex. 1006).

³ Ankur Agiwal, *LOCATOR – Location Estimation System For Wireless LANs*, WMASH 2004: Proceedings of the Second ACM International Workshop on Wireless Mobile Applications and Services on WLAN Hotspots, 102–109 (2004) (Ex. 1005).

For the purposes of this Decision, we adopt the assessment offered by Petitioner as it is consistent with the '753 patent and the prior art before us. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

B. Claim Construction

In *inter partes* reviews, the Board interprets claim language using the district-court-type standard, as described in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100(b). Under that standard, we generally give claim terms their ordinary and customary meaning, which “is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application” and “after reading the entire patent.” *See Phillips*, 415 F.3d at 1313, 1321. Although extrinsic evidence, when available, may also be useful when construing claim terms under this standard, extrinsic evidence should be considered in the context of the intrinsic evidence. *See id.* at 1317–19.

Petitioner proposes the following five claim constructions:

Claim Term	Petitioner’s Proposed Construction
calibration data	“modified or unmodified network measurement data associated with a geographic location”
calibration points	“geographic points with which calibration data is associated”
grid point	“a point associated with representative calibration data for an area”
network measurement report	“a report used in cellular networks which provides the results of a measurement from a mobile device on one or more cells”
order of “providing,” “generating,” “evaluating,” and “selecting” steps	“construed as ‘providing has to occur before generating, and generating has to occur before both evaluating and selecting.’”

Pet. 19–21 (citing Ex. 1008 ¶ 54; Ex. 1024, 1; Ex. 1028, 8, 18, 20).

Petitioner asserts that any other claim term should be interpreted consistent with the *Phillips* standard. *Id.* at 19.

Petitioner’s proposed constructions are based on the claim constructions issued by the district court (*see* Ex. 1028, 8, 18, 20) or positions taken by Patent Owner in the Google Action (*see* Ex. 1024, 1–2).

In its Response, Patent Owner disputes only the construction of the term “grid point.” PO Resp. 16–24. Patent Owner argues that the district court’s construction of the term requires that the representative calibration data be evaluated to determine the boundaries of the area represented by a “grid point.” *Id.* According to Patent Owner:

The district court adopted the phrase ‘representative calibration data for an area’ in its construction of ‘grid point’ to ‘reflect that ***the defining characteristic of a NUG*** [non-uniform grid point] ***region***—as explained in the specifications of the ’753 Patent, ’104 Patent, and [’784] Patent—***is that the data points within an area are all ‘statistically very similar’*** such that each of the grid points within the NUG region can represent the overall NUG.’”⁴

PO Resp. 18 (quoting Ex. 1028, 20) (second alteration in original). Patent Owner argues that “the district court explained that the phrase ‘representative calibration data for an area’ in its construction means that the calibration data associated with a grid point are ‘statistically very similar’ such that the calibration data are representative of the area encompassed by the grid point.” *Id.* (citing Ex. 2020 ¶ 77). Patent Owner also argues that the

⁴ The ’104 patent is U.S. Patent No. 7,561,104 (Ex. 1018), and the ’784 Patent is U.S. Patent No. 9,097,784 (Ex. 2013). Patent Owner notes that the ’104 patent and the ’784 patent both claim priority to the ’379 provisional application, which is incorporated by reference into the ’104 patent. PO Resp. 6 n.2.

'753 patent describes the claimed grid points in the same way. *Id.* (citing Ex. 1001, 10:55–11:6; Ex. 2020 ¶ 77). According to Patent Owner, because this statistical similarity “is a ‘defining characteristic,’ the claimed grid points cannot exist until after the calibration data is gathered and analyzed.” *Id.*; *but see* PO Sur-Reply 3 (“PO’s construction does not require evaluating statistical similarity.”).

Patent Owner also argues that the district court’s construction of “grid point” “requires that the boundaries of the area represented by a given grid point be determined by evaluating the calibration data so that the subset of data associated with that grid point is representative of that area.” PO Resp. 18–19 (citing Ex. 2020 ¶ 78); *see also id.* at 9 (“[A] fundamental characteristic of a claimed grid point is that the geographical boundaries of the area it represents must be determined by evaluating the calibration data collected in a region.” (citing Ex. 2020 ¶ 66)). Patent Owner contends that the '753 patent describes that this determination “involve[es] the evaluation of statistical similarities across the set of calibration data gathered within a region, and teach examples of the statistical analyses used to generate the claimed grid points from this calibration data.” *Id.* at 19 (citing Ex. 1001, 10:39–65, 12:4–14, 10:66–11:6; Ex. 1003, 6–7; Ex. 2020 ¶ 78); *see also id.* at 12 (“The evaluation of calibration data that is part of generating a grid point involves determining which data are ‘statistically very similar’ using ‘increasingly stringent tests of statistical sufficiency’ such that they can be associated with (or ‘allocated to’) a particular grid point.” (citing Ex. 1001, 10:44–59; Ex. 1003, 6–7; Ex. 2020 ¶ 71)).

Patent Owner argues that “the district court’s construction requires evaluating the calibration data to determine the boundaries of the area

represented by a grid point so that ‘representative calibration data for [the] area’ can be associated with it.” PO Resp. 19 (citing Ex. 2020 ¶ 79).

According to Patent Owner, “[i]f the calibration data is not evaluated, the ‘representative calibration data for an area’ cannot be defined, and thus cannot be associated with a point.” *Id.* (citing Ex. 2020 ¶ 79).

Patent Owner further argues that “[c]onsistent with the district court’s construction, the intrinsic record requires that ‘grid points,’ including the boundaries of the area they represent, be generated based on evaluation of the calibration data.” PO Resp. 20 (citing Ex. 2020 ¶¶ 80–88). Patent Owner asserts that because the independent claims of the ’753 patent require “[providing/receiving] calibration data for each of one or more calibration points in a geographic region” and “generat[ing] one or more sets of grid points for said calibration data,” the claims require “generating grid points—including the boundaries of the areas they represent—based on an evaluation of calibration data.” *Id.* (citing Ex. 1001, claims 1, 32; Ex. 2020 ¶ 80).

Patent Owner asserts that the ’753 patent Specification supports the proposed construction. PO Resp. 20 (citing Ex. 2020 ¶¶ 81–87). Patent Owner argues that the Specification teaches that grid points are generated based on an analysis of calibration data, referring to the disclosure that “calibration data for these locations must be gathered and analyzed so that particular points (e.g., ‘grid points’) within the geographic region can be determined and associated with a particular set or sets of calibration data from, for example, one or more NMRs.” *Id.* (quoting Ex. 1001, 2:31–35, citing Ex. 1001, code (57), 9:34–39; Ex. 2020 ¶ 81). Patent Owner further asserts that the Specification provides support that “the boundaries of the area represented by a grid point—which define the shape of that area—are

variable because they are based on evaluation of statistical similarities across the gathered calibration data.” *Id.* at 21 (citing Ex. 1001, 12:7–14; Ex. 1003, 7; Ex. 2020 ¶ 82). In support, Patent Owner refers to the ’753 patent disclosure that:

The NUGs may fully cover the region R and each NUG may have statistically similar data accumulated into itself. The geometrical shape (i.e., the shape defined by the union of locations of calibration points assigned to the NUG) and the amount of data accumulated into such NUGs is seen to be variable since these are determined by the statistical similarity of the data allocated to a NUG.

PO Resp. 21 (quoting Ex. 1001, 12:7–14 (emphasis omitted); citing Ex. 1003, 7; Ex. 2020 ¶ 82).

Next, referencing Figure 6 of the ’784 patent, which shows a geographical region having three “NUGs” (NUG1, NUG2, NUG3), Patent Owner argues that “[c]alibration data is gathered at different locations in this broader region and then analyzed to define grid points that divide the region into different areas represented by each grid point.” PO Resp. 21–22 (citing Ex. 2013, 6:21–34, Fig. 6; Ex. 2020 ¶¶ 83–84); *see also id.* at 6–8 (making similar arguments based on Figure 6 of the ’784 patent).

Patent Owner argues that the ’379 provisional application, which is incorporated by reference, discloses that evaluation of calibration data is “of great importance” because it is fundamental to generating the grid points. PO Resp. 23 (citing Ex. 1001, 1:8–11; Ex. 2020 ¶ 86). Patent Owner contends that the grid points “must be generated based on an evaluation of the measured calibration data,” with a determination of the boundaries of the area represent, regardless of whether the resulting grid points are uniform or non-uniform. *Id.* (citing Section II, Ex. 1001, 2:31–35; Ex. 2020 ¶ 85).

Patent Owner further alleges that the '753 patent describes using statistical similarity to evaluate calibration data and discloses multiple methods for evaluating statistical similarity. *Id.* at 23–24 (citing Ex. 1001, 10:44–11:6, 12:4–14; Ex. 1003, 6–7; Ex. 2020 ¶ 86). Thus, according to Patent Owner, “the ‘geometrical shape’ (*i.e.*, boundaries) of the area represented by a particular non-uniform grid point is ‘determined by the statistical similarity of the data’ allocated to a grid point, which is based on evaluation of the calibration data.” *Id.* at 24 (citing Ex. 1001, 12:4–14; Ex. 1003, 7; Ex. 2020 ¶ 87).

In view of the above assertions, Patent Owner contends the district court’s construction of the term “grid point” “requires that a grid point—including the boundaries of the area represented by that grid point—be determined from evaluation of calibration data,” which is alleged to be confirmed by the intrinsic evidence. PO Resp. 24.

In its Reply, Petitioner argues that Patent Owner’s prior attempts to introduce additional requirements into the district court’s construction of “grid point” were rejected previously by the district court and the Board. Pet. Reply 3 (citing Ex. 1028, 19; Dec. 31).

Petitioner argues that, contrary to Patent Owner’s position, the '753 patent discloses that a grid point associated with representative calibration data includes measurement of a single signal strength. Pet. Reply 6 (citing Ex. 1001, 10:29–59, 12:15–25, 12:58–67). Petitioner asserts that the file history of the '753 patent does not require grid point generation by an evaluation involving statistical analysis or boundaries. *Id.* at 7–8. Petitioner argues that, at best, the terms “evaluation,” “statistically very similar” data, and “boundaries of an area” correspond to exemplary methods. *Id.*

Petitioner refers to the '379 provisional application of the '753 patent that discloses that grid points and non-uniform grid points are not based on statistical consistency and similarity of data. *Id.* at 8 (citing Ex. 1003, 8). Petitioner further contends that the '104 patent “confirms that the grid points can be determined from collected calibration data without further evaluation.” *Id.* at 7 (citing Ex. 1018, 3:52–60; Ex. 2023, 37:10–22).

Petitioner additionally argues that Patent Owner’s assertion that the '753 patent file history involves generation of a grid point by any special evaluation involving “statistical analysis” of “boundaries” is not supported. Pet. Reply 7. Petitioner asserts that the use of terms like “evaluation,” “statistically very similar” data, and “boundaries of an area” refer to exemplary methods and “[t]he '379 Provisional Application . . . expressly discloses generating grid points and NUGs that are not based on statistical consistency/similarity of data.” *Id.* at 7–8 (citing Ex. 1003, 8). Petitioner contends that Patent Owner does not provide a basis for limiting non-uniform grid point to any specific exemplary method using statistical similarity and boundaries of an area, and there is no demonstration of clear disclaimer or disavowal. *Id.* at 8. Petitioner refers to, for instance, Patent Owner’s reliance on a '753 patent disclosure referring to statistical similarity of data allocated to a non-uniform grid point, noting that this disclosure is merely one embodiment. *Id.* (citing PO Resp. 21; Ex. 1001, 12:7–17). Furthermore, Petitioner argues that Patent Owner’s reliance on Figure 6 of the '784 patent is misplaced. *Id.* at 9. Petitioner contends that the '784 patent “expressly states that Figure 6 illustrates ‘an exemplary non-uniform grid (NUG) region’, and Patent Owner’s expert agrees.” *Id.* (quoting Ex. 2013, 3:12–13 (emphasis omitted); citing Ex. 1031, 115:13–20). Petitioner

also refers to testimony of Mr. Sturza in which he did not explain how boundaries are determined or stored because it may have required getting into embodiments, which was not the subject of his opinions. *Id.* at 9 (citing Ex. 1031, 57:10–14).

Petitioner asserts that the '753 patent confirms that “representative calibration data” can include a single calibration point as an exemplary set of calibration data. Pet. Reply 11 (citing Ex. 1001, 10:64–65). Petitioner argues that Patent Owner ignored this disclosure, its expert did not provide an opinion on the amount of calibration data forming a non-uniform grid point, and the District Court’s claim construction order confirmed that calibration data can be a single calibration point. *Id.* at 10–11 (citing PO Resp. 12, 18; Ex. 1028, 20; Ex. 1031, 52:13–53:5; 52:20–22; 101:1–4). Petitioner also contends that Patent Owner’s proposed construction injects ambiguity, such that the metes and bounds of the claim cannot be determined. *Id.* at 12. In particular, Petitioner asserts that the scope of “evaluation” and “statistical similarity” under Patent Owner’s construction are uncertain because Patent Owner does not explain the metes and bounds, the '104 and '753 patents do not provide sufficient explanation, nor could Mr. Sturza explain how an evaluation is performed or “statistical similarity” be ascertained. *Id.* at 12–14 (citing Ex. 1031, 83:19–21, 87:5–6, 87:9–15, 75:2–5, 84:4–6, 81:6–10, 82:13–21).

Petitioner refers to Mr. Sturza’s testimony that “the '753 Patent uses the term ‘non-uniform grid points’ or ‘NUGs’ when describing grid points.” Pet. Reply 12 n.2 (citing Ex. 2020 ¶ 60). Petitioner also references Mr. Sturza’s testimony that the '753 patent “‘conflate[s]’ nonuniform grid points

with grid points and “[t]here’s not, you know, a clear distinction.” *Id.* (quoting Ex. 1032, 14:23–15:1).

In Sur-reply, Patent Owner asserts that its proposed claim construction “gives meaning to the term ‘representative’ which Petitioner’s arguments otherwise read out of the construction.” PO Sur-reply 2. Patent Owner argues that the “area” of the “representative calibration data” under the district court construction has a boundary that is determined from evaluating the calibration data. *Id.* Patent Owner contends that “the ’104 Patent and its family members teach that NUGs are determined based on areas that have *representative* calibration data for an area.” *Id.* at 3 (citing Ex. 1018, 3:50–52; 3:56–57). Patent Owner argues that its proposed construction does not require evaluating statistical similarity. *Id.* Patent Owner also asserts that Petitioner presents positions to the district court that are opposite to those presented here, and the district court relied on Petitioner’s representations and adopted its construction. *Id.* at 3–5. Patent Owner further contends that the district court claim construction agrees with its construction that “calibration data” must be “analyzed” to determine non-uniform grid points. *Id.* at 5 (citing Ex. 1028, 19). While Patent Owner agrees that a non-uniform grid point can be formed from one or more signal strengths measured at a point, Patent Owner argues that even non-uniform grid points that “consist[] of a single calibration point are formed based on evaluation of calibration data at neighboring points.” *Id.* at 6–7 (citing Ex. 1001, 10:59–65, 10:47–50, 10:63–65). Patent Owner contends that a non-uniform grid point “is representative of the calibration data in a given region, it is not the calibration data,” but “evaluation of calibration data is necessary to generate” it. *Id.* at 7–8 (citing Ex. 1001, 2:56–59, 3:5–9, 3:16–19). Patent

Owner additionally asserts that Petitioner provides “no intrinsic analysis or evidentiary support that ‘evaluation’ and ‘boundaries of an area’ are optional for” non-uniform grid points. *Id.* at 9 (citing Pet. Reply 7–9).

We agree with Petitioner that Patent Owner’s additional requirements of evaluating the calibration data to determine the boundaries of the area should not be included in the construction of “grid point.” Instead, based on the full record, and for the reasons explained below, we discern no reason to alter our prior construction in the Institution Decision of “grid point” as “a point associated with representative calibration data for an area.” Dec. 22–23.

The construction of “grid point” we adopt is supported by the Specification of the ’753 patent. Patent Owner’s arguments for the construction of the term “grid point” rely, in large part, on disclosures relating to non-uniform grid points. Patent Owner’s expert testifies that there is not a clear distinction between grid points and non-uniform grid points and the ’753 patent “uses the term ‘non-uniform grid points’ or ‘NUGs’ when describing grid points.” Ex. 2020 ¶ 60; Ex. 1032, 14:23–15:1. We disagree with this assertion—the ’753 patent distinguishes between “grid points” and “non-uniform grid points” and also discloses that grid points may have calibration data assigned to them. For instance, the ’753 patent states that:

A NUG generator or a method to produce NUGs may begin the NUG generation operation using, for example, one of more of the following: (a) *a fixed uniform grid (“UG”) defined over the region R with the calibration point data being assigned to the fixed grid points by some rule* (e.g., allocated by closest fixed grid point, a centroid of a set of fixed grid points, etc.); (b) random grid points to define the start of each NUG; (c)

combinations of (a) and (b) depending on the characteristics of the calibration data; or (d) some other useful method.

Ex. 1001, 10:29–38 (emphasis added).

The '753 patent thus discloses that there may be a “fixed uniform grid” over a region, where “calibration point data” is assigned to “fixed grid points,” and a “NUG generator” may use this “fixed uniform grid.” *See* Ex. 1001, 10:29–38; *see also id.* at 13:1–12. This provides support that grid points are not limited to non-uniform grid points, but may also be uniform grid points.⁵ Further, the disclosures provide support that a point is associated with calibration data consistent with Petitioner’s and the district court’s interpretation of the term “grid point.” Notably, under the '753 patent’s disclosure cited above there is no requirement that a grid point be a point associated with calibration data *for an area whose boundaries are determined from evaluation of the calibration data*, as Patent Owner argues. Rather, the grid points may be “fixed” prior to calibration data being “assigned to the fixed grid points by some rule.”

Turning to other of Patent Owner’s arguments, we are not persuaded by their contentions that, because the district court referred to the data points within an area being statistically similar as the defining characteristic of a NUG region, the claimed grid points have to generated after the calibration data is gathered and analyzed. *See* PO Resp. 18–21. This contention, even if it were correct, is not persuasive because it is generally improper to read limitations from specific embodiments into the claims. *See Cadence*

⁵ Note also that the '379 provisional application distinguishes between “NUG – Non-Uniform Grid Point” and “UG-Uniform Grid Point.” *See* Ex. 1003, 5.

Pharms. Inc. v. Exela PharmSci Inc., 780 F.3d 1364, 1369 (Fed. Cir. 2015) (“[E]ven if all of the embodiments discussed in the patent included a specific limitation, it would not be proper to import from the patent’s written description limitations that are not found in the claims themselves.” (internal quotations omitted)); *see also SuperGuide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004) (“Though understanding the claim language may be aided by the explanations contained in the written description, it is important not to import into a claim limitations that are not a part of the claim.”). Patent Owner’s assertion that the ’784 patent describes evaluating the statistical similarities of calibration data (PO Resp. 20–21, 23) is insufficient reason to import a requirement requiring the evaluation of calibration data into the construction of “grid point” or “non-uniform grid point.” Similarly, Patent Owner’s assertion that the ’379 provisional application discloses that evaluation of calibration data is “of great importance” because it is fundamental to generating the grid points is unpersuasive. *See id.* at 23. Describing evaluation as being “of great importance” is an insufficient basis for importing a requirement for evaluation. *See Texas Instruments, Inc. v. U.S. Int’l Trade Comm’n*, 805 F.2d 1558, 1563 (Fed. Cir. 1986) (“[The Federal Circuit] has cautioned against limiting the claimed invention to preferred embodiments or specific examples in the specification.”).

We also note that, when the ’379 provisional application states “[t]he evaluation of the data vectors is of great importance since it is fundamental to the method” (emphasis added), this statement is made in the context of describing “Invention 1: A method for generating Non-Uniform Grid Points (NUGs) from calibration data.” Ex. 1003, 5–6. This is one of fifteen

inventions described by the provisional application. The challenged claims of the '753 patent, in contrast, are directed to “[a] method of determining the location of a mobile device.” Ex. 1001, 59:14–15. The claims at issue here do not recite “non-uniform grid points” at all. Although evaluation of data vectors may be “fundamental” to the first way of generating non-uniform grid points set forth by the provisional application, this does not mean that evaluation of data vectors is necessarily fundamental to every way of generating any kind of grid point (whether, for example, fixed or non-uniform). Indeed, the provisional application suggests that other methods may be available by describing Invention 1 as “[a] method” as opposed to describing it as the only possible method.

Furthermore, we agree with Petitioner that evaluating the statistical similarities of calibration data is an exemplary method of generating grid points and not a requirement, and many ways of generating grid points are disclosed. *See* Pet. Reply 6–8. As Petitioner notes, the '753 patent discloses that “[one] may also consider ***the method of generating NUGs based not on statistical consistency of calibration data, but on other conditions.***” *Id.* at 8 (quoting Ex. 1001, 12:15–17) (alteration in original). The '753 patent also lists several such alternate methods that are not based on statistical similarity. Ex. 1001, 12:17–25; *see also id.* at 10:29–41. Also, the '379 provisional, incorporated by reference into the '753 patent, states that the invention “considers the method of generating NUGs based not on statistical consistency but on other conditions such as [providing five other examples].” Ex. 1003, 8; Ex. 1001, 1:8–11. As such, evaluating calibration data for statistical similarities is not required to generate a grid point.

In Sur-reply, Patent Owner argues that Petitioner's argument regarding evaluating the statistical similarity of calibration data is not supported by the file history and contradicts representations made in the district court. PO Sur-reply 3–5 (citing Pet. Reply 6). Regardless, we are persuaded on the full record that none of the '104 patent, the '379 provisional application, the '784 patent, or the '753 patent support that evaluating which data are statistically similar is required to generate a grid point. In particular, as noted above, the '753 patent discloses that methods not based on statistical consistency of calibration data can be used. Ex. 1001, 12:15–17, *see also id.* at 10:29–38.

Regarding Petitioner's assertion that the '753 patent discloses many ways to generate a grid point associated with representative calibration data for an area, Patent Owner argues that “[c]onsistent with [Patent Owner's] construction, Petitioner cites passages where the grid point represents an area whose boundaries are determined from evaluation of the calibration data.” PO Sur-reply 6 (citing Pet. Reply 6; Ex. 1001,⁶ 10:47–50, 12:15–25). We do not find this argument persuasively undermines Petitioner's position. These portions of the '753 patent do not disclose determining the boundaries of the area. *See* Ex. 1001, 10:47–50, 12:15–25. Furthermore, the '753 patent discloses several different methods, or ways, for generating grid points, such as “a minimum number of unique neighbors observed in data accumulated from allocated calibration grid points.” *Id.* at 12:15–25. The '753 patent also discloses that “representative calibration data” can be a

⁶ Patent Owner cites to “Ex. 1008,” but the correct citation is Exhibit 1001.

single calibration point and, in this instance, the single “calibration point may become the root of a separate NUG.” *Id.* at 10:60–65.

We also credit Mr. Williams’s testimony that determining which calibration data is representative of an area “would not require analysis” because “[i]t could be just the actual measurement,” and “analysis could be part of it, but it doesn’t have to be.” Ex. 2023, 37:10–22. We are not persuaded by Patent Owner’s argument that this testimony is not instructive because Mr. Williams limited his responses to the construction of calibration data and avoided responding to the question. *See* PO Sur-reply 8–9. Although Mr. Williams did refer to “the calibration data construction” in his response, we disagree that he avoided responding to the question asked. The question asked was: “To determine which of that calibration data is representative of an area would require analyzing that set of collected calibration data, right?” with the response: “It would not require analysis. It could be just the actual measurement.” Ex. 2023, 37:10–16. This testimony responded to the question asked.

Further, we are not persuaded by Patent Owner’s argument that the boundaries of the area represented by a grid point must be determined by evaluating the calibration data. *See* PO Resp. 9, 19–23. As noted above, the ’753 patent discloses that grid points may have calibration data assigned to them without any evaluation. *See* Ex. 1001, 10:29–38. Further, as discussed above, Patent Owner contends that the ’379 provisional application and the ’784 patent both describe determining these boundaries “as involving the evaluation of statistical similarities across the set of calibration data gathered within a region, and teach examples of the statistical analyses used to generate the claimed grid points from this calibration data.” *See* PO Resp.

19–23; *see also id.* at 12 (“This evaluation of calibration data involves determining which data are ‘statistically very similar’ using ‘increasingly stringent tests of statistical sufficiency’ such that they can be associated with (or ‘allocated to’) a particular grid point.” Cited passages of the ’379 provisional application and the ’784 patent, however, do not describe determining the boundaries of a NUG area. *See* Ex. 1003, 6–7; Ex. 1001, 10:39–65, 12:4–14.

Moreover, the ’379 provisional application discloses evaluating “data vectors” by searching for data vectors that exhibit clustering. Ex. 1003, 6. The ’379 provisional application further states:

If the data exhibits tight clustering, the data for the next candidate calibration point is aggregated to the former and the clustering property is re-evaluated. If the second also has a cluster but this cluster is sufficiently different, we deem that the data for the two considered calibration points should be allocated to the roots of separate NUGs. If the aggregate cluster is statistically very similar to either of the first clusters, the data for the two calibration points are allocated to the same NUG.

Ex. 1003, 6. This disclosure indicates that statistically similar calibration points are allocated to a NUG independently of the boundaries of the NUG area. In other words, for this embodiment, the calibration points allocated to a NUG define the boundaries of the NUG area rather than the size and shape of the NUG area determining which calibration points are allocated to the NUG. Accordingly, it is not necessary to determine the boundaries of a NUG area first in order to generate the NUG.

Additionally, we disagree with Patent Owner’s argument that the ’753 patent disclosure of gathering and analyzing calibration data demonstrates what must be done to arrive at a grid point or set of grid points based on the

district court’s use of the phrase “representative calibration data for an area” in its construction. *See* PO Resp. 2, 16–20. Instead, as discussed, we agree with Petitioner’s argument that neither “grid point” nor “non-uniform grid point” should be limited to require evaluation because evaluating calibration data is an example of what can be done to arrive at a grid point, instead of what a grid point is. *See* Pet. Reply 3–7.

Patent Owner argues that based on the district court’s order: “[t]hat the claimed grid points are associated with ‘representative calibration data for an area’—not just any calibration data—requires by its plain language that the calibration data be evaluated to determine what constitutes such representative data and the boundaries of the area represented by that data.” PO Resp. 2 (emphasis omitted). We do not agree that the plain language and reasoning of the district court supports Patent Owner’s position that generating a grid point requires evaluating the calibration data to determine the boundaries of the grid point’s area.

In the Google Action, Patent Owner argued “that the Abstract of the ’753 Patent provides a ‘near-definitional statement’ of [the “grid point”] claim term, and that its construction is derived from that text.” Ex. 1028, 19. Addressing this argument, the district court noted that the Abstract of the ’753 patent states, in relevant part:

The location of a wireless mobile device may be estimated using, at least in part, one or more pre-existing Network Measurement Reports (“NMRs”) which include calibration data for a number of locations within a geographic region. *The calibration data for these locations is gathered and analyzed so that particular grid points within the geographic region can be determined and associated with a particular set or sets of calibration data from, for example, one or more NMRs.*

Id. The district court then stated “[b]ut the italicized language from which [Patent Owner’s] construction is drawn is directed more toward *what must be done* to arrive at a grid point or set of grid points rather than what a grid point *is*.” *Id.* Therefore, the district court was explaining that the language related to a possible origin of a grid point rather than the meaning of “grid point.” The district court was not recognizing that generating a grid point requires evaluating calibration data or that the grid points necessarily have a characteristic that results from being generated via evaluating calibration data. *See also* Ex. 1003, 5 (provisional application explaining that a non-uniform grid point may optionally have a wide variety of characteristics). We agree with the district court’s analysis in this regard.

Additionally, Patent Owner’s contention that how the claimed grid points are generated is “fundamental” to what they are is not persuasive because, as discussed above, the ’753 patent discloses several methods for generating grid points or assigning calibration data to a grid point. Ex. 1001, 12:17–25, 10:29–38. Accordingly, no one method for generating a grid point can be considered fundamental.

We are also not persuaded by Patent Owner’s arguments that the shape and boundaries of the area represented by a non-uniform grid point are variable. *See* PO Resp. 2, 8, 12–13, 21–22. The fact that the shape, and thus the boundaries, of the area represented by a non-uniform grid point can vary does not establish that the boundaries must be determined in order to generate the grid point. Rather, as discussed above, the ’379 provisional application’s disclosure of evaluating “data vectors” indicates that statistically similar calibration points are allocated to a NUG independently of the boundaries of the NUG area. *See* Ex. 1003, 6.

In addition, Patent Owner’s arguments based on Figure 6 of the ’784 patent are not persuasive. *See* PO Resp. 6–8, 21–222. As Petitioner notes (Pet. Reply 9), however, the ’784 patent states that Figure 6 “illustrates an exemplary non-uniform grid (NUG) region (R).” Ex. 2013, 3:12–13 (emphasis omitted). We are not persuaded that this exemplary depiction of three NUGs establishes that the boundaries of the NUGs must first be determined in order to generate the NUGs. In sur-reply to Petitioner’s argument that Figure 6 of the ’784 patent illustrates only exemplary NUGs, Patent Owner argues that “Figure 6 . . . illustrates NUGs hav[ing] different shapes, sizes and boundaries depending on the representative calibration data for different areas. NUGS are not uniformly assigned to a pre-defined grid.” PO Sur-reply 10–11. Although Patent Owner is correct in that the three NUG areas depicted in Figure 6 have different shapes, sizes and boundaries, Figure 6 is nonetheless exemplary and does not establish that the boundaries of the NUGs must first be determined in order to generate the NUGs.

In view of the above and based on the full record, and consistent with Institution Decision, the evidence of record provides support that the term “grid point” is construed to be “a point associated with representative calibration data for an area.”

We determine that we need not construe any other claim terms. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

C. Principles of Law

A claim may be invalid as anticipated by a prior art reference if “each and every limitation is found either expressly or inherently in a single prior art reference.” *Sanofi–Synthelabo v. Apotex, Inc.*, 470 F.3d 1368, 1375 (Fed. Cir. 2006). Anticipation under § 102 may be established by showing, as a matter of fact, that all elements arranged as specified in a claim are disclosed within the four corners of a reference, either expressly or inherently, in a manner enabling one skilled in the art to practice an embodiment of the claimed invention without undue experimentation. *See ClearValue, Inc. v. Pearl River Polymers, Inc.*, 668 F.3d 1340, 1344 (Fed. Cir. 2012).

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when in evidence, objective indicia of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).⁷

D. Anticipation of Claims 1, 7, 9, 32, 38, and 40 by Spain

Petitioner contends that claims 1, 7, 9, 32, 38, and 40 are anticipated by Spain. Pet. 22–39. To support its contentions, Petitioner provides

⁷ No evidence of objective indicia of nonobviousness has been presented in the record. *See generally* Pet.; PO Resp.

explanations as to how the combination of the prior art discloses each claim limitation. *Id.* Petitioner also relies upon the Williams Declaration (Ex. 1008) to support its positions.

Patent Owner contends that Spain fails to disclose certain limitations of the claims. PO Resp. 25–29.

We begin our discussion with a brief summary of Spain, and then address the evidence and arguments presented.

1. Spain (Ex. 1006)

Spain generally relates to a “method for determining the location estimate of a . . . mobile unit[] in a wireless communication network” using RF fingerprinting. Ex. 1006, code (54), ¶¶ 30, 35, 47. When a location estimate of the mobile unit is desired, the mobile unit uses a fingerprint capture component to capture spectral information and generates a spectral fingerprint using one or more parameters, such as signal strength. *Id.* ¶¶ 40–41; *see also id.*, Fig. 2. Spain describes “utilizing a fingerprint database” stored in the mobile unit “that contains a number of fingerprints along with their corresponding location identities.” *Id.* ¶ 47. In one embodiment, “[t]he 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,” and “[t]he corresponding location in the database is then chosen as the location of the mobile unit.” *Id.* ¶

The fingerprint database may be “built by taking fingerprint measurements at predetermined locations and using intelligent algorithms that interpolate the fingerprints at all locations in between the sampled locations.” Ex. 1006 ¶ 101. For example, “[t]o improve the accuracy of the fingerprint database,” Spain describes using a learning/training technique in

which a “[r]egression can be used to learn each mapping of position versus fingerprint,” a “complete grid of locations for the cellular service area will be used as training data,” and “a new grid is generated for the database” by “interpolat[ing] between grid points and reconstruct[ing] the grid.” *Id.*

¶¶ 54–55. Spain also describes that, “[i]n one instance, [a] fingerprint [in the fingerprint database] corresponds not to one exact spot on the surface of the earth, but instead to a small area,” where “[t]he Lat and Long fields [associated with the fingerprint] . . . indicate a position inside the area, preferably the center point.” *Id.* ¶ 99, Fig. 10.

Figure 3 of Spain is reproduced below.

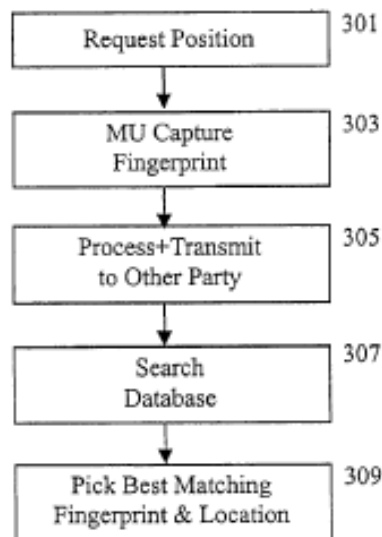


Fig. 3

Ex. 1006, Fig. 3. Figure 3 of Spain, above, depicts a flow chart of its position determining process according to one embodiment. *Id.* ¶ 13. As shown in Figure 3, Spain’s process generates a request for position of the mobile unit, where “[o]n receipt of the request the mobile unit captures the

fingerprint of its current location,” then processes the captured fingerprint, then transmits the fingerprint over the wireless link to the location server, with the location server then searching its database for the closest matching fingerprint, and then retrieves the best matching fingerprint along with its corresponding location. *Id.* ¶ 49.

An example of a database of possible locations of mobile units is reproduced in Table 1 below. Ex. 1006 ¶ 75.

^

TABLE 1

<u>Database of Possible Locations of Mobile Unit</u>					
Location	Latitude	Longitude	Fingerprint	Possible Serving Cell Site(s)	Possible Neighbor Cell Site(s)
1	47° 10' 23.12" N.	127° 23' 41.73" W.	F ₁	A, B	B, A
...	...	...	...	...	...
60,000	47° 13' 46.33" N.	127° 26' 44.53" W.	F _{60,000}	C	A, C

Table 1, above, shows the content of a possible location database including the location, with latitude and longitude, and associated respective fingerprints and possible serving cell sites and neighboring cell sites. Ex. 1006 ¶ 75. Spain states that, as shown in Table 1, a mobile unit is at one of sixty thousand possible locations. *Id.* Spain further states that “[a]lthough

the location server could compare the RF fingerprints received from the mobile unit to all 60,000 possible locations, the method [] eliminates some of the 60,000 possible locations based on which signals the mobile unit is able to receive and the relative strength of those signals in every location.”
Id.

2. Discussion

a. Independent Claim 1

Below we consider the claim 1 limitations in turn.

i. Limitation 1[pre]

Petitioner asserts that Spain discloses “[a] method for determining the location of a mobile unit (mobile unit) in a wireless communication system.” Pet. 23 (citing Ex. 1006, code (57); Ex. 1008 ¶¶ 69–70).

Spain discloses that it is directed to “[a] method for determining the location of a mobile unit (mobile unit) in a wireless communication system,” with consideration of positions of the mobile unit. *See* Ex. 1006, code (57).

Patent Owner presents no arguments specifically related to the preamble. *See generally* PO Resp.

On this complete record, we agree with Petitioner that Spain discloses the preamble of claim 1, that is, a method of determining the location of a mobile device in a geographic area.⁸

ii. Limitation [1.1]

Petitioner asserts that Spain discloses that a “fingerprint” is created by providing a “predetermined combination of observable RF spectral parameters,” such as “observed signal strengths,” with longitude and

⁸ We need not determine whether the preamble of claim 1 is limiting because Petitioner has shown that Spain discloses the preamble.

latitude obtained for each fingerprint entry. Pet. 23 (citing Ex. 1006 ¶¶ 35, 99, Fig. 10; Ex. 1008 ¶¶ 71–72). In support, Mr. Williams testifies that “[a] ‘fingerprint’ in Spain is created by providing a ‘predetermined combination of observable RF spectral parameters’ [calibration data having characterizing parameters observed at calibration points], such as ‘observed signal strengths.’” Ex. 1008 ¶ 72 (citing Ex. 1006 ¶ 35, 4–7). Petitioner contends that “Spain’s fingerprints are provided for calibration points, as ‘geographic points with which calibration data is associated,’” under the construction in the district court litigation.⁹ *Id.* at 24.

Patent Owner presents an argument for the generation of grid points “for said calibration data” of limitation [1.2], which refers to the “calibration data for each of one or more calibration in a geographic region” recited in this limitation. *See* PO Resp. 25–27. We address this arguments below in the discussion of limitation [1.2].

Patent Owner presents no arguments specifically related to this limitation. *See generally* PO Resp.

On this complete record, we agree with Petitioner that Spain discloses limitation [1.1].

iii. Limitation [1.2]

Petitioner asserts that Spain discloses sets of grid points where each set includes newly interpolated grid points. Pet. 24–25. Petitioner relies upon Spain’s disclosures where “learning/training techniques and methodologies can be adopted” and “[t]he machine is then re-trained and a

⁹ The term “calibration points” was stipulated by the parties to mean “[g]eographic points with which calibration data is associated” in the Google action. Ex. 1024, 1.

new grid is generated for the database,” with an advantage of “offer[ing] a way to interpolate between grid points and reconstruct the grid.” *Id.* at 25–26 (citing Ex. 1006 ¶¶ 54–55, 101; Ex. 1008 ¶¶ 75–76) (emphasis omitted). Petitioner refers to Spain’s disclosure that “the fingerprint corresponds not to one exact spot on the surface of the earth, but instead to a small area,” with the latitude and longitude fields indicating a position inside the area. *Id.* at 27 (citing Ex. 1006 ¶ 99) (emphasis omitted). Petitioner thus asserts that the grid point in Spain is “a point associated with representative calibration data for an area.” *Id.* (citing Section VI.C; Ex. 1008 ¶ 80).

The evidence supports that Petitioner has sufficiently demonstrated that Spain teaches “generating one or more sets of grid points for said calibration data,” as recited in limitation [1.2]. Spain states that:

In another embodiment, the database is built by taking fingerprint measurements at predetermined locations and using intelligent algorithms that interpolate the fingerprints at all locations in between the sampled locations.

Ex. 1006 ¶ 101. Relevant to this disclosure, Mr. Williams testifies that “Spain discloses generation of sets of grid points wherein each set includes newly interpolated grid points” because “the two grid points used to interpolate an additional grid point or points and the generated additional grid point or points are collectively a generated ‘set’ of grid points (i.e., a ‘set’ which includes the two calibrated grid points and the associated interpolated grid points).” Ex. 1008 ¶¶ 76–77 (citing Ex. 1006 ¶¶ 54, 55, 101). It is not disputed that Spain’s “fingerprints” are calibration data having characterizing parameters, such as observed signal strength, observed at calibration points. *See* Ex. 1006 ¶ 35. We find that this evidence

demonstrates that Spain discloses generating one or more grid points, where the grid points are associated with calibration data.¹⁰

Accordingly, the evidence provides support that Spain's interpolation of fingerprints at different locations discloses generation of one or more sets of grid points, where the grid points are associated with calibration data.

Spain also discloses that:

. . . the fingerprint corresponds not to one exact spot on the surface of the earth, but instead to a small area. The Lat and Long fields in this embodiment indicate a position inside the area, preferably the center point.

Ex. 1006 ¶ 99. Mr. Williams explains that this disclosure supports that “a grid point in Spain is ‘a point associated with representative calibration data for an area.’” Ex. 1008 ¶ 80. We agree that there is support for this opinion based on Spain's disclosure that states the fingerprint *corresponds to* [represents] the small area.

Thus, we agree with Petitioner that the evidence of record supports that Spain discloses generating sets of grid points for the calibration data, where the grid points are points associated with representative calibration data for an area.

Patent Owner asserts that Spain fails to disclose this limitation “under the proper construction of the term ‘grid point’ used in the claims.” PO Resp. 25. Patent Owner also contends that “[e]ven to the extent Petitioner's art is found to teach ‘grid points,’ it still fails to teach or render obvious the full limitation requiring the generation of grid points ‘for said calibration

¹⁰ Patent Owner agrees that the term “for” in limitation [1.2] means that there is an “association” between the “grid point” and the “calibration data.” See Tr. 83:6–15.

data,’ referring to the ‘calibration data for each of one or more calibration points in a geographic region’ recited in the preceding step.” *Id.* Patent Owner argues that the “calibration data” in the generating step is that provided in the previous step, so “the plain language of these claims requires that the claimed grid points *be generated based on* this calibration data.” *Id.* at 27 (citing Ex. 2020 ¶ 93) (emphasis added). Patent Owner further contends that “even if the Board finds that the term ‘grid point’ does not require the evaluation of calibration data to define the boundaries of the area represented by a ‘grid point,’ the remaining claim language in the Challenged Claims includes this requirement.” *Id.* (citing Ex. 2020 ¶ 94).

Patent Owner further asserts that in Spain, the interpolated fingerprints are at predetermined locations that are determined in advance independently of any calibration data. *Id.* (citing Ex. 2020 ¶ 95). Patent Owner further contends that, although fingerprints may correspond to a “small area” surrounding a predetermined location, there is no teaching of how this area is defined and boundaries determined. *Id.* (citing Ex. 1006 ¶¶ 99–101; Ex. 2020 ¶ 96). Patent Owner contends that Spain does not teach that boundaries are based on the evaluation of calibration data, and the fingerprints, and areas corresponding to a fingerprint, are predetermined and independent of any evaluation of calibration data. *Id.* at 27–28 (citing Ex. 2020 ¶ 97).

In Sur-reply, Patent Owner additionally asserts “that Spain does not generate grid points *based on* calibration data as required by the claim under either party’s construction.” PO Sur-reply 18–19 (emphasis added). Patent Owner argues that its expert’s opinions rely on the language of the claim, regardless of the claim construction adopted. *Id.* at 19 (citing Ex. 2020 ¶ 93

(“For this reason, the plain language of the claims requires that the claimed grid points be generated based on this calibration data.”)). Patent Owner contends that for the calibration data that corresponds to a small area, there is no discussion in Spain that there is any evaluation to determine whether the data are representative—they are only assigned to an area. *Id.* at 20 (citing Ex. 1006 ¶¶ 99–101). Patent Owner asserts that “Spain does not generate grid points associated with representative calibration data for an area; instead, it assigns calibration data (i.e., measured or interpolated signal strength) to a predetermined, uniform grid.” *Id.*

We have not adopted Patent Owner’s proposed construction of “grid point” for the reasons discussed above in Section III.B. The majority of Patent Owner’s arguments are based on its proposed claim construction, which is that the meaning of “grid points” includes that they “must be generated based on evaluation of the calibration data, and Spain fails to teach or suggest this.” Because we have not adopted Patent Owner’s proposed construction of the term, Patent Owner’s related arguments fail. We also note that Patent Owner presents arguments using varied language differing from “generated” like “based on.” Although different wording may be used, many of these arguments, in effect, are on based Patent Owner’s rejected proposed claim construction. This also applies to Patent Owner’s arguments that in Spain its fingerprints and associated areas are predetermined; but this argument ignores that the operative issue is whether the grid points are generated wherein the grid points *are associated* with the representative calibration data, which Spain discloses for the reasons discussed above.

Moreover, Patent Owner argues that the calibration data used in the “gathering” step refers to the “calibration data” in the previous “providing” step, suggesting this as a reason that Spain does not disclose the limitation. *See* PO Resp. 25–27. We do not agree. Petitioner asserts that for the “providing” step, Spain discloses that calibration data [fingerprints] are provided for calibration points [geographic points with which calibration data is associated] and stored in a database. *See* Pet. 23–24; Ex. 1006 ¶¶ 35, 70–72, 99, Fig. 10. The “generating” claim limitation requires only that the grid points *be associated with* the representative calibration data for an area, which is disclosed by Spain. More specifically, in the “generating” step, Petitioner relies on Spain’s fingerprints, which include the same stored calibration data of the previous step, for the interpolation for locations between the sampled locations, wherein the fingerprint corresponds to a small area, which demonstrates the disclosure of the limitation by Spain. *See* Pet. 24–27; Ex. 1006 ¶¶ 35, 99, 101. Accordingly, we find Patent Owner’s arguments unpersuasive and, thus, they do not serve to undermine Petitioner’s adequate showing.

On this complete record, we agree with Petitioner that Spain discloses limitation [1.2].

iv. Limitation [1.3]

Petitioner argues that Spain discloses that a captured fingerprint “is stored in the fingerprint structure[] [i.e., network measurement report] that includes characterizing parameters.” Pet. 27 (citing Ex. 1006 ¶ 97, Fig. 9) (emphasis omitted). Petitioner asserts that Spain discloses that “the generated fingerprint (in the mobile unit) is transmitted to the location server over the wireless link” (EX1006, [0048] []), which expressly includes signal

strengths and the identity of the current serving cell for the mobile unit.” *Id.* at 27–28 (citing Ex. 1006 ¶¶ 44, 48, 57, 66, 82, Fig. 12 (step 1203); Ex. 1008 ¶¶ 85–86).

Patent Owner presents no arguments specifically related to this limitation. *See generally* PO Resp.

We have reviewed the evidence and argument, and on this complete record, we agree with Petitioner that Spain discloses limitation [1.3].

v. Limitation [1.4]

Petitioner asserts that Spain evaluates “fingerprint structures” received from a mobile unit with each of the sets of grid points as a function of the identity of a characterizing parameter. Pet. 29–30. Petitioner identifies the characterizing parameter as the current serving cell, where Spain explains “the number of possible locations of the mobile unit that must be searched can be reduced when an approximate estimate of the mobile unit’s location is available,” which is a search evaluation. *Id.* at 30 (quoting Ex. 1006 ¶ 66 (emphasis omitted); citing Ex. 1008 ¶¶ 90–91). Petitioner further relies upon Spain’s disclosure of “Test #1” that “[e]liminates all locations outside the serving area of the cell that is reported as the serving cell.” *Id.* at 31 (citing Ex. 1006, Fig. 15; Ex. 1008 ¶¶ 82, 92) (emphasis omitted).

Patent Owner presents no arguments specifically related to this limitation. *See generally* PO Resp.

We have reviewed the evidence and argument, and on this complete record, we agree with Petitioner that Spain discloses limitation [1.4].

vi. Limitation [1.5]

Petitioner asserts that Spain discloses selecting grid points, that is, multiple fingerprints, using signal strength as the “predetermined criteria.”

Pet. 32 (citing Ex. 1006 ¶ 47; Ex. 1008 ¶ 97) (emphasis omitted). Petitioner relies upon Spain’s description of the step for location estimate:

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.

EX1006 ¶ 47 (quoted at Pet. 32).

Patent Owner presents no arguments specifically related to this limitation. *See generally* PO Resp.

We have reviewed the evidence and argument, and on this complete record, we agree with Petitioner that Spain discloses limitation [1.5].

vii. Limitation [1.6]

Petitioner asserts that Spain discloses the selection of grid points as the “closest” by signal strength and interpolating the location as explained by: “the search algorithm takes more than one fingerprint from the database that are closest to the generated fingerprint and interpolates the most plausible location for the MU [mobile unit] from the locations of the chosen fingerprints.” Pet. 33 (citing Ex. 1006 ¶ 47; Ex. 1008 ¶¶ 102–103).

Patent Owner presents no arguments specifically related to this limitation. *See generally* PO Resp.

We have reviewed the evidence and argument, and on this complete record, we agree that Petitioner that Spain discloses limitation [1.6].

viii. Conclusion

Weighing the record as a whole in view of the findings and analysis above, we conclude that Petitioner has met its burden to show, by a preponderance of the evidence, that claim 1 is anticipated by Spain.

b. Independent Claim 32

Claim 32 is a system claim that recites similar limitations to the limitations of method claim 1. Petitioner relies on similar evidence and argument to that presented for claim 1 for this claim. Pet. 35–38.

Patent Owner presents no additional arguments specifically directed to claim 32 that we have not already addressed. *See generally* PO Resp.

We have reviewed the Petition’s showing for this claim on the complete record and find that Petitioner has met its burden to show, by a preponderance of the evidence, that independent claim 32 is anticipated by Spain.

c. Dependent Claims 7 and 38

Claim 7 recites: “[t]he method of claim 1 wherein said calibration data comprises information from a network measurement report.” Ex. 1001, 59:45–46. Petitioner asserts that Spain discloses that “the fingerprint database is built using fingerprints captured and transmitted as reports, just as in location determination,” which anticipates this claim. Pet. 34 (citing Ex. 1006 ¶¶ 56, 100, 98, 99, Figs. 9, 10; Ex. 1008 ¶¶ 106–108).

Claim 38 recites a limitation similar to claim 7. Ex. 1001, 64:15–16. Petitioner relies upon similar evidence to its showing for claim 7 for this claim. Pet. 38.

Patent Owner presents no additional arguments specifically directed to claims 7 and 38 that we have not already addressed. *See generally* PO Resp.

We have reviewed the Petition’s showing for these claims on the complete record and find that Petitioner has met its burden to show, by a

preponderance of the evidence, that claims 7 and 38 are anticipated by Spain.

d. Dependent Claims 9 and 40

Claim 9 recites:

The method of claim 1 wherein said characterizing parameter is selected from the group consisting of: signal strength for a signal transmitted by a transmitter having a known location as received by a receiver at said grid point; signal strength of a signal transmitted by a transmitter located at said grid point as received by a receiver at a known location; round trip time for a signal traveling between said grid point and a known location; timing advance of a signal received by said mobile device at said grid point; time difference of arrival of plural signals at said grid point with respect to a pair of known locations as measured by a receiver at said grid point or at said known locations; the identification of a serving cell or serving sector of said mobile device located at said grid point; a state of a wireless network serving said mobile device, and combinations thereof.

Ex. 1001, 59:51–65.

Petitioner refers to “Spain’s inclusion of current serving cell identity when transmitting a network measurement report during location determination” which discloses “the identification of a serving cell or serving sector of said mobile device located at said grid point.” Pet. 35 (citing Ex. 1008 ¶¶ 109–111).

Claim 40 recites a limitation similar to claim 9. Ex. 1001, 64:21–35. Petitioner relies upon similar evidence to its showing for claim 9 for this claim. Pet. 38.

Patent Owner presents no additional arguments specifically directed to claims 9 and 40 that we have not already addressed. *See generally* PO Resp.

We have reviewed the Petition’s showing for these claims on the complete record and find that Petitioner has met its burden to show, by a

preponderance of the evidence, that claims 9 and 40 are anticipated by Spain.

D. Obviousness of Claims 1, 7, 9, 32, 38, and 40 Over Spain as Evidence by Agiwal

Petitioner also asserts that claims 1, 7, 9, 32, 38, and 40 would have been obvious over Spain as evidenced by Agiwal. Pet. 22–39. We begin with a brief discussion of Agiwal and then discuss the ground.

1. Agiwal (Ex. 1005)

Agiwal is a paper describing an RF-based system for locating and tracking users in a wireless LAN network called LOCATOR. Ex. 1005, 102. Agiwal’s LOCATOR system “works in two phases. In the first phase, it builds a radio map [database] of the site where the wireless network is deployed,” where “[t]he radio map [database] is a mapping between the physical locations and the observed signal strength values at these locations from various base stations.” *Id.* at 103. Among other things, the radio map building phase employs a technique of fragmenting the radio map database into location-based clusters to reduce computation cost while answering location search queries. *Id.*; *see also id.* at 104–105.

“In the second phase, LOCATOR uses the radio map to estimate the location of a user, given its current observed signal strength values from various base stations.” Ex. 1005 at 103; *see also id.* at 103–106. Agiwal also states:

In the location estimation phase, the users periodically query the radio map database with their observed signal strengths (q_1 , q_2 , q_3) from the 3 base stations. To estimate a user’s location, LOCATOR . . . :

1. Performs a k-best search in the 3-dimensional signal space using the previous estimate of the user's location and (q_1 , q_2 , q_3)
2. Clusters the k points based on their physical closeness
3. For each cluster, estimates the most probable location of the user and its likelihood
4. Chooses the location with the highest likelihood as the current estimate of the user's location.

Ex. 1005, 105; *see also id.* at 102 (Abstract).

2. Discussion

Petitioner refers to Agiwal to note that, like Spain, “Agiwal discloses an initial approximate location-based search of its database using live measurement data transmitted from a mobile device.” Pet. 18. Petitioner, however, relies only on Spain for its obviousness assertions. *Id.* at 22–38.

The above discussion and Petitioner's showing related to anticipation by Spain also equally apply to the obviousness showing over Spain as presented by Petitioner. *See Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983). Patent Owner presents no additional arguments specifically directed to Petitioner's showing as to obviousness under Spain that we have not already addressed. *See generally* PO Resp. Patent Owner also presents no evidence of objective indicia of nonobviousness. *See generally* PO Resp.

Weighing the record as a whole in view of the findings and analysis above, we conclude that Petitioner has met its burden to show, by a

preponderance of the evidence, that claims 1, 7, 9, 32, 38, and 40 would have been obvious over Spain as evidenced by Agiwal.

IV. CONCLUSION¹¹

The outcome for the challenged claims of this Final Written Decision follows. In summary:

Claim(s)	35 U.S.C. §	Reference(s) /Basis	Claim(s) Shown Unpatentable	Claim(s) Not Shown Unpatentable
1, 7, 9, 32, 38, 40	102(b)	Spain	1, 7, 9, 32, 38, 40	
1, 7, 9, 32, 38, 40	103(a)	Spain, Agiwal	1, 7, 9, 32, 38, 40	
Overall Outcome			1, 7, 9, 32, 38, 40	

III. ORDER

It is, therefore

ORDERED that Petitioner has demonstrated by a preponderance of the evidence that claims 1, 7, 9, 32, 38, and 40 of the '753 patent are unpatentable; and

FURTHER ORDERED that because this is a Final Written Decision,

¹¹ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*, 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

IPR2023-01212
Patent 8,406,753 B2

parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

PETITIONER:

Patrick Keane
Roger Lee
Matthew Fedowitz
Andrew Cheslock
Mythili Markowski
Samuel Harrod
Ralph Fischer
BUCHANAN INGERSOLL & ROONEY PC
patrick.keane@bipc.com
roger.lee@bipc.com
matthew.fedowitz@bipc.com
andrew.cheslock@bipc.com
mythili.markowski@bipc.com
samuel.harrod@bipc.com
ralph.fischer@bipc.com

PATENT OWNER:

James Carmichael
Stephen McBride
Minghui Yang
CARMICHAEL IP, PLLC
jim@carmichaelip.com
stevemcbride@carmichaelip.com
mitch@carmichaelip.com

Saunak Desai
Christopher Gerson
SCHULTE ROTH & ZABEL LLP
saunak.desai@srz.com
chris.gerson@srz.com