

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

GEOSCOPE TECHNOLOGIES PTE. LTD.
Patent Owner

Case No. IPR2024-00259
U.S. Patent No. 8,406,753

PATENT OWNER'S PRELIMINARY RESPONSE

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LIST OF EXHIBITS

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EX1001	U.S. Patent No. 8,406,753 to Alles et al. (“the ’753 Patent”)
EX1002	Excerpts from the Prosecution History of the ’753 Patent (“the Prosecution History”)
EX1003	Declaration of Dr. Karthikeyan Sundaresan
EX1004	U.S. Application Publ. No. 2006/0211376 to Tarun Kumar Bhattacharya <i>et al.</i> (“Bhattacharya”)
EX1005	[RESERVED]
EX1006	U.S. Patent No. 7,783,299 to Robert J. Anderson <i>et al.</i> (“Anderson”)
EX1007	Special Mobile Group (SMG) Technical Committee (TC), European Telecommunications Standards Institute, <i>GSM Technical Specification - Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 specification (GSM 04.08)</i> (Dec. 1995)
EX1008	U.S. Patent No. 6,560,442 to George Yost <i>et al.</i> (“Yost”)
EX1009-1019	[RESERVED]
EX1020	Memorandum Opinion & Order (Docket No. 92), <i>Geoscope Technologies PTE. LTD. v Apple Inc.</i> , 1:22-cv-01373, (E.D. Va. Jul. 19, 2023)
EX1021	[RESERVED]
EX1022	Memorandum, Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation (USPTO June 21, 2022) (“Interim Procedure”)
EX1023	Memorandum Opinion (Docket No. 109), <i>Geoscope Technologies PTE. LTD. v Apple Inc.</i> , 1:22-cv-01373, (E.D. Va. Sept. 18, 2023)

EX1024	Notice of Appeal dated Sept. 25, 2023, <i>Geoscope Technologies PTE. LTD. v Apple Inc.</i> , 1:22-cv-01373, (E.D. Va.)
EX1025	Stipulation Regarding Agreed Upon Claim Constructions, <i>Geoscope Technologies PTE. LTD. v Apple Inc.</i> , 1:22-cv-01373, (E.D. Va. May 23, 2023

Exhibit No.	Patent Owner's Exhibits
2001	Declaration of Saunak K. Desai in Support of Patent Owner's Motion For Pro Hac Vice Admission of Saunak K. Desai Under 37 C.F.R. § 42.10(c)
2002-2007	Reserved
2008	Memorandum Opinion on Google's Motion for Judgment on the Pleadings on Patent Eligibility dated Sept. 18, 2023, <i>Geoscope Technologies Pte. Ltd. v Google LLC</i> , Civ. Action No.1:22-cv-01331, (EDVA)
2009	Final Judgment dated October 5, 2023, <i>Geoscope Technologies Pte. Ltd. v. Apple Inc.</i> , Civ. Action No. 1:22-cv-01373 (EDVA)
2010	Final Judgment dated October 6, 2023, <i>Geoscope Technologies Pte. Ltd. v. Google LLC</i> , Civ. Action No. 1:22-cv-01331 (EDVA)
2011	Order dated June 26, 2023, <i>Geoscope Technologies Pte. Ltd. v. Apple Inc.</i> , Civ. Action No. 1:22-cv-01373 (EDVA)
2012	Claim Construction Memorandum Opinion & Order, <i>Geoscope Technologies Pte. Ltd. v. Google Inc.</i> , 1:22-cv-01331, (E.D. Va. Jul. 19, 2023)
2013	Order dated June 26, 2023, <i>Geoscope Technologies Pte. Ltd. v. Google LLC</i> , Civ. Action No. 1:22-cv-01331 (EDVA)
2014-2015	Reserved
2016	U.S. Patent No. 7,561,104

2017	U.S. Patent No. 9,097,784
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I. INTRODUCTION

The Board should deny the Petition for *Inter Partes* Review of U.S. Patent No. 8,406,753 (“’753 Patent”) because Petitioner Apple Inc. (“Petitioner”) fails to demonstrate a reasonable likelihood that any challenged claim is not patentable.

As an initial matter, the Board should exercise its discretion to deny the Petition under § 314(a). Two district court litigations involving the ’753 Patent have already resulted in final judgments based on the district court’s ruling that the asserted claims are unpatentable pursuant to 35 U.S.C. § 101. These litigations are *Geoscope Technologies Pte. Ltd. v. Apple Inc.*, Civ. Action No. 1:22-cv-01373-MSN (E.D. Va.) (“Apple Action”) and *Geoscope Technologies Pte. Ltd. v. Google LLC.*, Civ. Action No. 1:22-cv-01331-MSN (E.D. Va.) (“Google Action”). Moreover, by the time the district court issued its § 101 opinion—and months before the Petition was filed—the parties and the court had already invested substantial resources into the actions, completing *Markman*, fact discovery, and expert discovery. Under similar circumstances, the Board has recognized that institution would not be an efficient use of its time and resources. Notably, the Director recently reviewed a Board panel’s decision to deny institution in view of a district court’s prior § 101 invalidity determination—based on an analysis of the *Fintiv* factors—and left that analysis intact, finding no fault in the panel’s heavy reliance on the district court’s

§ 101 ruling. Further, the Petition falls far short of presenting a “compelling unpatentability challenge” that would warrant institution despite this inefficiency.

Even if the merits are considered, the Petition still fails. At a minimum, Petitioner does not show that its cited art has any teaching or suggestion of “generating one or more sets of grid points for said calibration data”—a key limitation of the ’753 Patent that was relied upon to distinguish other art during prosecution. The Petitioner proposed the district court’s construction of “grid point,” which recognizes that the grid points of the ’753 Patent are not just any points on a grid. Rather, they have specific requirements including that they are generated based on the analysis of calibration data. Thus, what Petitioner relies on in the cited references is fundamentally different from the grid points of the ’753 Patent. As a result, Petitioner is unable to point to any disclosure in its prior art references that meets aspects of the claim construction that it proposed for this proceeding. Instead, Petitioner simply ignores those aspects of the construction. This is a fatal flaw that warrants denial of institution.

II. THE BOARD SHOULD EXERCISE ITS DISCRETION TO DENY THIS PETITION UNDER § 314(a)

The Board should exercise its discretion to deny institution under § 314(a) because institution would be an “inefficient use of Board resources.” *NHK Spring Co.*, IPR2018-00752, Paper 8 at 19-20. As explained in further detail below, two district court litigations involving the ’753 Patent are not just at advanced stages but,

in fact, have *already resulted in final judgments* stemming from the district court's ruling that the asserted claims are unpatentable pursuant to 35 U.S.C. § 101.

In *NHK Spring Co.*, the Board denied institution of an *inter partes* review under § 314(a) where a parallel district court proceeding was nearing its final stages, and a PTAB proceeding would not conclude until about six months after the district court trial was scheduled. *NHK Spring Co.*, IPR2018-00752, Paper 8 at 19-21. In so reasoning, the Board set the precedent that parallel court proceedings must be considered when determining whether the institution of an *inter partes* review is consistent with the objective of the America Invents Act ("AIA") to "provide an effective and efficient alternative to district court litigation." *Id.*

Building on *NHK Spring Co.*, in *Apple Inc. v. Fintiv, Inc.*, the Board identified specific factors relating to "whether efficiency, fairness, and the merits support the exercise of authority to deny institution in view of an earlier trial date in the parallel proceeding." IPR2020-00019, Paper 11 at 6 (PTAB Mar. 20, 2020) (precedential).

The *Fintiv* factors include:

1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
2. proximity of the court's trial date to the Board's projected statutory deadline for a final written decision;
3. investment in the parallel proceeding by the court and the parties;
4. overlap between issues raised in the petition and in the parallel proceeding;

5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
6. other circumstances that impact the Board's exercise of discretion, including the merits.

Id.

The Director provided further guidance on the application of the *Fintiv* precedent in a June 21, 2022 Memorandum regarding an Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation (“Guidance Memo”) and *CommScope Techs. LLC v. Dali Wireless, Inc.*, IPR2022-01242, Paper 23 (PTAB Feb. 27, 2023) (precedential). The Director set forth a “compelling merits test” under which the Board—if it has found that *Fintiv* factors 1-5 favor discretionary denial—must assess whether a petition presents a “compelling unpatentability challenge” before discretionarily denying institution. *CommScope*, IPR2022-01242, Paper 23 at 3-5. As the Director explained, “the compelling merits standard is a higher standard than the standard for institution set by statute.”¹ *Id.* at 3. A reasonable likelihood that the petitioner would prevail with respect to at least one challenged claim does not suffice to demonstrate that a

¹ Institution of an IPR is authorized only when “the information presented in the petition ... and any response ... shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a); *CommScope*, IPR2022-01242, Paper 23 at 3 n.3.

challenge is “compelling.” Rather, a “compelling” challenge is one “in which the evidence, if un rebutted in trial, would plainly lead to a conclusion that one or more claims are unpatentable by a preponderance of the evidence” such that “it is **highly likely** that the petitioner would prevail with respect to at least one challenged claim.” *Id.* at 3-4 (emphasis added). This is a “high standard” (see *AviaGames, Inc. v. Skillz Platform, Inc.*, IPR2022-00530, Paper 14 at 3, 5 (PTAB Mar. 2, 2023)) and the Board must explain its reasoning in determining whether the merits are compelling. *CommScope*, IPR2022-01242, Paper 23 at 4-6.

The *Fintiv* factors weigh strongly in favor of discretionary denial and Petitioner’s challenge does not meet even the statutory standard, let alone the higher “compelling merits” standard. On September 18, 2023, the district court issued its ruling that the asserted claims of the ’753 Patent are unpatentable under § 101 in both the Apple Action and the Google Action. Exs. 1023, 2008. Shortly thereafter, on October 5, 2023 and October 6, 2023, the district court issued final judgments in both actions. Exs. 2009, 2010. Accordingly, both actions are closed pending Patent Owner’s appeal to the Federal Circuit.

The Board has recognized that the *Fintiv* factors strongly favor denial of institution where the challenged patent has already been invalidated by the district court under § 101. In *AviaGames*—which is **directly** analogous to the present case—the Board denied institution after weighing the *Fintiv* factors “largely because the

claims of the challenged patent have been determined to be invalid” explaining that “the interests of efficiency and integrity of the system would be best served by invoking 35 U.S.C. § 314(a) to deny institution” in view of the district court’s ruling under § 101. *AviaGames*, IPR2022-00530, Paper 12 at 11-15. Although the Board initially exercised its discretion to deny institution based on the *Fintiv* factors alone, the Director remanded the matter to the Board *only* to assess “whether the record before the Board prior to institution presents a compelling, meritorious challenge.” *AviaGames*, IPR2022-00530, Paper 14 at 5-6.

Importantly, the Director did not disagree with or take issue with the Board’s analysis of the *Fintiv* factors in *AviaGames*. Rather, the Director’s decision was entirely about the “compelling merits test”—none of it found fault in the Board’s analysis of the *Fintiv* factors. *See id.* at 5. Indeed, the decision suggests that the Director endorsed the Board’s treatment of the *Fintiv* factors in *AviaGames*—including the critical importance the district court’s § 101 ruling played in that analysis—as the Director left that *Fintiv* analysis intact and stated that “[i]f the Board finds the record does not rise to [the compelling merits] standard, the Board *will* exercise discretion to deny institution.” *Id.* at 5 (emphasis added). Thus, based on the Director’s guidance, the district court’s prior § 101 invalidity determination is highly relevant to the *Fintiv* analysis and supports discretionary denial.

Similarly, in *Snap Inc. v. Blackberry Ltd.*, a district court had issued an order finding all claims of the challenged patent invalid under § 101; as a result, the Board denied institution, in large part because it did “not consider it an efficient use of Board resources to institute an *inter partes* review where all remaining Challenged Claims have already been adjudicated by an Article III court.” IPR2020-00391, Paper 8 at 17 (PTAB July 13, 2020).

As discussed below, the *Fintiv* factors favor discretionary denial here even more than they did in *AviaGames* and *Snap*. And because Petitioner has failed to meet the high standard required by the “compelling merits test,” the Board should exercise its discretion to deny institution under § 314(a).

A. Factor 1: The district court case has concluded, and cannot be stayed

“A district court stay of the litigation pending resolution of the PTAB trial allays concerns about inefficiency and duplication of efforts,” and thus “weigh[s] against exercising the authority to deny institution under *NHK*.” *Fintiv*, IPR2020-00019, Paper 11 at 6.

Petitioner has not sought a pre-institution stay in view of the instant Petition. Nor could it because the district court proceedings are closed pending the § 101 appeal to the Federal Circuit. Accordingly, contrary to Petitioner’s assertion, there is no need to “predict” whether the district court will stay the related litigation—the district court **cannot** stay the litigation given the posture. Pet. at 56. Thus, as the

Board found in *Snap*, this factor weighs in favor of exercising discretion to deny institution. *Snap*, IPR2020-00391, Paper 8 at 13; *see also AviaGames*, IPR2022-00530, Paper 12 at 12 (finding that *Fintiv* Factor 1, if weighed, favors denial because “the District Court’s invalidity determination has already been made”).

B. Factor 2: The Board’s final written decision deadline would be more than one year after the district court issued its § 101 decision

As demonstrated by *NHK Spring Co.* and its progeny, “[i]f the court’s trial date is earlier than the projected statutory deadline, the Board generally has weighed this fact in favor of exercising authority to deny institution under *NHK*.” *Fintiv*, IPR2020-00019, Paper 11 at 9.

The district court completed its consideration of the ’753 Patent and reached its final decision in September 2023, months before the Board would even institute review, much less issue a final written decision. There is no further scheduled or proposed trial date in the Apple Action. In *AviaGames*, under the same circumstances, the Board found that this factor “weighs *heavily* in favor of denying institution” because “the District Court has completed its consideration of the [challenged patent].” *AviaGames*, IPR2022-00530, Paper 12 at 12-13 (emphasis added). As noted above, when reviewing the Board’s decision in *AviaGames*, the Director did not find error in or set aside the Board’s determination that this factor

supports discretionary denial based on the district court's prior § 101 invalidity determination. *See AviaGames*, IPR2022-00530, Paper 14 at 5-6.

The Board in *Snap* came to the same conclusion, finding that this factor weighed in favor of denying institution because the Board's statutory deadline for the final written decision would be "one year after the district court issued final judgment." *Snap*, IPR2020-00391, Paper 8 at 13. For the same reasons, the Board should find that this factor weighs in favor of denial of institution.

C. Factor 3: There has been substantial investment by the parties and district court in the litigation, culminating in a final decision by the court

"[I]f, at the time of the institution decision, the district court has issued substantive orders related to the patent at issue in the petition, this fact favors denial." *Fintiv*, IPR2020-00019, Paper 11 at 9-10.

The Apple Action is concluded as a result of the district court's § 101 ruling—*i.e.*, a substantive order related to the '753 Patent. Ex. 1023. Based on the same facts, the Board in *AviaGames* and *Snap* found this factor to weigh in favor of denial of institution. *AviaGames*, IPR2022-00530, Paper 12 at 13 ("The District Court's invalidity determination is a substantive order related to the [challenged] patent. We determine this factor weighs in favor of denying institution.") (citations omitted); *Snap*, IPR2020-00391, Paper 8 at 13 (finding that *Fintiv* Factor 3 supports denial of institution because "[t]he parties' and district court's investment in the district court

case was sufficient to already reach a final adjudication”). As noted above, when reviewing the Board’s decision in *AviaGames*, the Director did not find error in or set aside the Board’s determination that this factor supports discretionary denial based on the district court’s prior § 101 invalidity determination. *See AviaGames*, IPR2022-00530, Paper 14 at 5-6.

Even before the district court issued its § 101 ruling, the parties and district court had already made a substantial investment in the litigation. The district court issued a *Markman* order (Ex. 1020) —another substantive order related to the ’753 Patent—before the Petition was filed and this weighs in favor of denial. Moreover, fact and expert discovery in the Apple Action were completed prior to the district court’s § 101 ruling and completed long before the Petition was filed on October 31, 2023. *See* Ex. 2011 (setting July 3, 2023 deadline for opening expert reports and August 18, 2023 deadline for close of expert discovery). This completed discovery included extensive written discovery, numerous depositions of fact and expert witnesses, and expert reports (including those addressing the validity of the ’753 Patent under 35 U.S.C. §§ 102 and 103).

Petitioner contends that it has “diligently worked on addressing the validity of the asserted patents” in this proceeding in various ways (Pet. at 57) but it did not file the Petition until *after* the parties and the district court invested significant resources in the related litigation. Indeed, by the time the Petition was filed, all

discovery in the related litigation had been completed, claim construction had been completed, and the district court had already issued its § 101 ruling and final judgment. Petitioner’s purported investment in this proceeding does not outweigh the significant investment made by the district court, Patent Owner, and even Petitioner itself in the related litigation—all of which occurred months before the Petition was filed. Nor does Petitioner’s purported investment take away from the substantial resources that the Board and the parties will need to expend if this proceeding moves forward.

Moreover, the district court and Patent Owner also made a substantial investment in the Google Action, another litigation involving the ’753 Patent.² The

² Although Petitioner is not a party to the Google Action, the Board has recognized that discretionary denial under the *Fintiv* factors can be based on a district court litigation involving the same challenged patent even if Petitioner is not a party to that case. For example, in *Mylan Laboratories Ltd. v. Janssen Pharmaceutica NV*, IPR2020-00440, Paper 17 (PTAB Sept. 16, 2020), the Board denied institution after evaluating the *Fintiv* factors for two related litigations involving the challenged patent—one between the patent owner and the petitioner (referred to as the “Mylan litigation”) and one between the patent owner and a different defendant (referred to as the “Teva litigation”). *Id.* at 9-11, 25.

same substantive orders—a *Markman* order and § 101 ruling—were issued by the district court in the Google Action. Exs. 2012, 2008. And fact and expert discovery were also completed in the Google Action prior to the district court’s § 101 ruling in September 2023. Ex. 2013 (setting July 3, 2023 deadline for opening expert reports and August 18, 2023 deadline for close of expert discovery). Again, Petitioner chose to file the Petition *after* these parties and the district court invested substantial resources in the case.

Thus, even aside from the district court’s substantive § 101 ruling related to the ’753 Patent, there has been substantial investment by the parties and the district court in the Apple Action (and the Google Action). Accordingly, in this proceeding, this factor weighs even more heavily in favor of denying institution than it did in *AviaGames* and *Snap* where the Board found that the district court’s § 101 ruling alone was sufficient to conclude that this factor weighs in favor of denying institution.

D. Factor 4: The ’753 Patent was found to be invalid by another tribunal and, in any event, there is substantial overlap between issues raised in the petition and in the district court

Fintiv states that “if the petition includes the same or substantially the same claims, grounds, arguments, and evidence as presented in the parallel proceeding, this fact has favored denial,” and if “other circumstances weigh against redoing the

work of another tribunal, the Board may, nonetheless, exercise the authority to deny institution.” *Fintiv*, IPR2020-00019, Paper 11 at 12, 14.

In *AviaGames*, the Board determined that the fact that “the challenged patent ha[d] already been found to be invalid by another tribunal” weighed in favor of exercising discretion to deny institution. *AviaGames*, IPR2022-00530, Paper 12 at 14. For at least the same reason, the Board should find the same here. As noted above, when reviewing the Board’s decision in *AviaGames*, the Director did not find error in or set aside the Board’s determination that this factor supports discretionary denial based on the district court’s prior § 101 invalidity determination. *See AviaGames*, IPR2022-00530, Paper 14 at 5-6.

Petitioner argues that there is no overlap of issues because the pending appeal is limited to § 101 issues (Pet. at 58) but this disregards that Petitioner has raised §§ 102 and 103 issues for the ’753 Patent in the related litigation. And it ignores the substantial record developed in that litigation—including expert reports and deposition testimony that address these §§ 102 and 103 issues—that the parties expended significant resources to prepare.

Additionally, even if there is no overlap between the § 101 issues on appeal and the §§ 102/103 issues raised here, that is immaterial. The same was true in *AviaGames*, as explained above. Despite that, the Board found that this factor weighs in favor of exercising discretion to deny institution. *AviaGames*, IPR2022-00530,

Paper 12 at 14. And, despite reviewing the Board’s decision in *AviaGames*, the Director did not find fault in the Board’s treatment of this factor, which relied heavily on the district court’s prior § 101 invalidity determination even though it had no overlap with the §§ 102/103 issues raised in the petition. Rather, the Director left the Board’s analysis of the *Fintiv* factors—including this factor—completely intact, only remanding so the Board could assess whether the petition presented “compelling merits.” *See AviaGames*, IPR2022-00530, Paper 14 at 5-6.

It is an inefficient use of the Board’s resources to adjudicate the validity of the ’753 Patent where the district court has already done it. And even if considering only the validity of the ’753 Patent under §§ 102 and 103, it is an inefficient use of the Board’s resources to develop a record that has already been developed in the Apple Action. Thus, this factor weighs in favor of denying institution.

E. Factor 5: Petitioner and the defendant in the district court litigation are the same party

The petitioner here and the defendant in the district court litigation are both Apple Inc.—in other words, identical. This was true in *Fintiv*, *Snap*, and *AviaGames*. Therefore, this factor weighs in favor of denying institution.

F. Factor 6: Other circumstances weigh in favor of exercising discretion to deny institution, including the merits

The “factors considered in the exercise of discretion” are part of a “balanced assessment of all the relevant circumstances in the case, including the merits.”

Fintiv, IPR2020-00019, Paper 11 at 14. “[I]f the merits of the grounds raised in the petition are a closer call, then that fact has favored denying institution when other factors favoring denial are present.” *Id.* at 15.

As discussed in the merits sections below, each ground is lacking at least because the asserted references fail to teach the “[generate/generating] one or more sets of grid points for said calibration data” limitation. *Infra* § VII. Thus, at best, the merits in this case fall into the camp of a “closer call,” not in Petitioner’s favor. At a minimum, the merits fall far short of satisfying the “compelling merits test” which presents a “higher standard than the standard for institution set by statute,” requiring that it be “highly likely that the petitioner would prevail with respect to at least one challenged claim.” *CommScope*, IPR2022-01242, Paper 23 at 3-5.

Additionally, in *AviaGames*, the Board explained in connection with this factor that “on balance, the District Court’s invalidity determination is the most important relevant circumstance and, as the challenged patent has already been found to be invalid, this factor favors denial of institution.” *AviaGames*, IPR2022-00530, Paper 12 at 14-15. The same is true here—the district court has already found the challenged patent to be invalid and, for the same reason as in *AviaGames*, this weighs in favor of denying institution. As noted above, when reviewing the Board’s decision in *AviaGames*, the Director did not find error in or set aside the Board’s determination that this factor supports discretionary denial based on the district

court's prior § 101 invalidity determination. *See AviaGames*, IPR2022-00530, Paper 14 at 5-6.

Because institution of any ground raised in the Petition would be an inefficient use of the Board's resources—as evidenced by all six *Fintiv* factors—and the Petition does not satisfy the “compelling merits test,” the Board should exercise its discretion under § 314(a) to deny institution.

III. OVERVIEW OF THE '753 PATENT

The '753 Patent is directed to an invention for determining the location (or “geolocating”) of a mobile device using signal information from wireless communications networks (*e.g.*, cellular signals). Ex. 1001 at 1:15-23. This involves collecting “calibration data” which includes measuring the properties of such network signals at known locations. *Id.* at 9:49-59. These properties may include, as one example, the measured strengths of the network signals, as received at those known locations. *Id.* at 9:60-10:8. After the calibration data is available, mobile devices at unknown locations can observe network signals and measure their properties (*e.g.*, signal strength), and then compare this observed data to the previously-gathered calibration data to determine their location. *Id.* at 9:43-48.

The invention of the '753 Patent involves the generation and use of what the patent refers to as “grid points” to improve the accuracy and efficiency of this process for using network signals for geolocation. *Id.* at 2:21-50. As used in the '753

Patent, “grid points” are not merely points on a grid. Rather, as explained below, the grid points of the ’753 Patent are data structures that are generated and associated with signal information based on analysis of the similarities between calibration data that has been previously collected in a region. Because they are generated based on the calibration data—rather than being predefined—the location, geographical boundaries, and associated signal information of the grid points are not defined until determined from particular aspects of the calibration data. The grid points serve as additional known locations associated with network signal information, creating a denser “map” for mobile devices to compare observed data to for the purpose of determining their location.

The grid points of the ’753 Patent “usually will not be uniformly distributed throughout the geographic region,” and thus the ’753 Patent (and related patents) often uses the term “non-uniform grid points” or “NUGs” when describing grid points. *See* Ex. 1001 at 2:43-50; *see also* Ex. 2016 at 3:50-60.³ Additionally, the grid

³ U.S. Patent No. 7,561,104 (Ex. 2016; “’104 Patent”) and U.S. Patent No. 9,097,784 (Ex. 2017; “’784 Patent”) claim priority to the same provisional application as the ’753 Patent, and also describe “grid points” as the term is used in this patent family. Consequently, the district court relied on disclosures in the ’104 Patent and ’784

points “represent an area of collected calibration data.” Ex. 1018 at 3:56-60.

Accordingly, the district court construed “grid point” as “a point associated with representative calibration data for an area,” which is the same construction that Petitioner proposes for this proceeding. Pet. at 8 (citing Ex. 1020 at 18-20).

In its *Markman* order, the district court provided further detail about the meaning of “grid point” in the ’753 Patent and its construction of the term. *First*, the district court stated that the ’753 Patent’s explanation that calibration data from a number of 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” demonstrates “what *must be done* to arrive at a grid point or set of grid points.” Ex. 1020 at 19 (quoting ’753 Patent at Abstract) (emphasis in original). Accordingly, the district court acknowledged that the claimed grid points must be generated based on the measured calibration data—they do not exist until generated by the claimed invention. This further explanation from the district court is consistent with its adopted construction because, logically, associating a point with “*representative* calibration data” requires analyzing the calibration data to determine what constitutes such representative data.

Patent in construing the term “grid point.” *See* Ex. 1020 at 19-20 (citing ’104 Patent (as “Ex. B”) and ’784 Patent (as “Ex. F”)).

Second, the district court explained that “representative calibration data” in its adopted construction reflects that “the defining characteristic of a NUG region ... 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.” Ex. 1020 at 20 (citing Ex. 2016 at 3:56-60; Ex. 1001 at 10:29-11:7; Ex. 2017 at 6:22-28). In other words, the geographical boundaries of the claimed grid points are undefined until determined by the claimed invention based on similarities across the measured calibration data. This further shows the district court recognized that its construction requiring associating a point with “representative calibration data” necessarily entails analyzing the calibration data to assess similarities and determine what data is representative.

Thus, although termed grid *points*, they are not just “points”—they represent a broader area whose boundaries are defined by the commonality of the calibration data measured in the region. This is depicted in the related ’784 Patent, which shows “a geographical region (R) having NUGs represented by NUG1, NUG2, and NUG3,” and explains “[a] NUG may be generated to represent the signal characteristics and calibration data over a given region.” Ex. 2017 at 6:21-34.

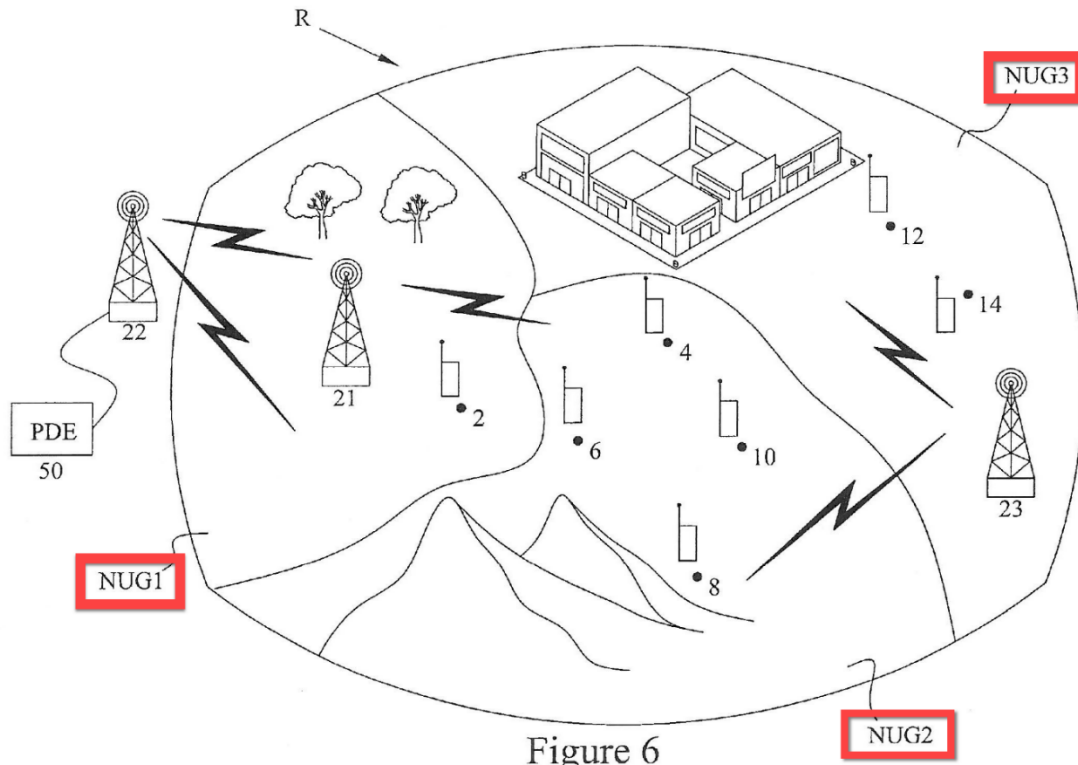


Figure 6

Id. at Fig. 6.

To generate grid points, calibration data for a number of 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.” Ex. 1001 at Abstract, 9:34-39. The calibration data used to generate grid points “may be obtained at each of several calibration points, which may be discrete points within region R each having geographical coordinates (e.g., latitude and longitude) associated therewith” and can include information regarding, for example, signal strength. *Id.* at 9:56-10:7. A single point—the “grid point” or “non-uniform grid point”—is then generated and includes specific coordinates but is also defined by

the geographical area comprising similar calibration data. *See id.* at 9:34-48. For this reason, the set of grid points is well-defined and ordered from a network signal perspective, but appears irregular and non-uniform from a geographical perspective, as shown in the figure above.

Generating the claimed grid points includes determining their location (or “geographical coordinates”) and boundaries based on evaluation of the calibration data. *Id.* at 9:34-40, 12:9-14; *see also id.* at 2:51-60. Because the claimed grid points are generated from calibration data gathered in a region, they are tailored in location and shape to that region based on the available calibration data. *Id.* at 12:9-14. Additionally, generating grid points includes associating them with “characteristics” that describe the grid point—*e.g.*, information about signal strengths derived from the measured calibration data. *Id.* at 12:26-50. Thus, as taught in the specification, each grid point is a data structure that captures the necessary components to define parameters of the network signals in a region and their propagation:

For each so obtained NUG [non-uniform grid point], a variety of parameters and functions may be generated and stored to describe that NUG. These are termed the NUG characteristics. The NUG characteristics are a representation in that attempt to capture the nature and variability of the data associated with that NUG in a compact and representative form. These characteristics may include, but are not limited to, the following: (a) an ordered list of neighboring cells; (b) functions defined on the absolute neighboring cell power levels (*e.g.*,

mean, median, k^{th} moment, cluster-mean, etc.); (c) functions defined on the relative neighboring cell power differences (e.g., mean, median, k^{th} moment, cluster-mean, etc.); (d) serving cell/sector; (e) timing advance parameter (or equivalent); (f) individual pdf (probability density function or probability distribution function) of each neighboring cell power level; (g) joint pdf of neighboring cell power levels; (h) mean and variance of neighboring cell power levels; (i) mobile device orientation (e.g., indoors, outdoors, direction mobile device is facing (e.g., North, South, etc.), tilted upwards, azimuth, elevation, etc.); (j) a compact and/or efficient representation that enables retrieval of the calibration data NMR vectors assigned to this NUG; (k) the network state as indicated in the calibration data; (l) a confidence measure indicative of the reliability of the calibration data feeding this NUG ...

Id.

The claimed grid points are new creations that define a geographical area based on the propagation of signals of opportunity in the area, and capture parameters of that propagation to enable later geolocation using observed signals. Consequently, the “grid” of the ’753 Patent does not exist—and is not defined—until the calibration data is gathered and analyzed to generate the claimed “grid points,” each with a unique shape and geographical area dictated by the propagation of the network signals in a region, as determined from the measured calibration data.

The ’753 Patent describes how grid points are generated based on the evaluation of calibration data. For example, the statistical similarity of the

calibration data can be evaluated to determine where a grid point should be generated, if one should be generated at all. Ex. 1001 at 10:66-11:6. The statistical similarity in the calibration data can be assessed based on clustering tests, a probability density function, the mean and variance of the data, or other functions of the calibration data. *Id.* at 10:66-11:6, 12:4-14.

Once the grid points are generated, they can be used in connection with geolocating a mobile device using network signals. “The location of a wireless mobile device may be estimated by comparing data reported by the mobile device to be geolocated with the data (and more particularly the characteristics derived from this data) associated with the various grid points to thereby estimate the location of the mobile.” *Id.* at 9:43-48. This involves evaluating data observed by the mobile device with the grid points and then selecting the set of generated grid points that are appropriate for comparison to that observed data based on predetermined criteria such as “total probability, cluster radius, Euclidean norm, joint probability, and Mahalanobis distance.” *Id.* at 5:63-6:7, 51:27-33.

In this way, the invention of the ’753 Patent improved on conventional methods for geolocation using network signals through the generation and use of grid points—as that term is used in the ’753 Patent—including non-uniform grid points. The invention enabled using existing calibration data to create additional known locations, tailored to a region based on similarities across the calibration data,

that are associated with wireless signal information. Thus, instead of using network signal information only from certain sources—*e.g.*, cellular towers that may be far away from each other and the device—a mobile device could geolocate itself via comparison to newly-generated grid points, ensuring more accurate geolocation with simpler calculations.

IV. SUMMARY OF THE REFERENCES ASSERTED IN THE PETITION

A. Bhattacharya

Bhattacharya describes a “process and machine for estimating the location of a wireless terminal” by “comparing the signal strength [the wireless terminal] currently observes against a map or database that correlates locations to signal strengths.” Ex. 1004 at Abstract. In the process described in Bhattacharya, an “Expected Signal-Strength Database” is first populated by overlaying “a rectangular grid of X by Y tessellated squares [] onto geographic region” with the “center of each square represent[ing] a location.” *Id.* at [0105]-[0106]. Expected signal-strength functions are “generated based on a combination of: (i) a plurality of theoretical radio-frequency propagation models, and (ii) a plurality of empirical signal-strength measurements” for locations in the geographic region. *Id.* at [0115]-[0117].

To estimate the location of a wireless terminal, Bhattacharya describes a process of comparing signal-strength measurements against the database of expected

signal strengths through a series of “computationally intense” subtasks (*i.e.*, Bhattacharya’s subtasks 1702-1705) relating to generating a “current probability distribution” and “cumulative probability distribution.” *Id.* at [0172]-[0173], [0179], [0189], [0195]. In the final step, the location of the wireless terminal is estimated “based on the normalized cumulative probability distribution.” *Id.* at [0207].

B. Yost

Yost describes a “method for locating concentration of mobile radio (MR) traffic in a coverage area [] by identifying where MRs [] in the coverage area [] are actively making calls.” Ex. 1008 at Abstract. This determination of “where the MR traffic is concentrated” can be used to “make system design decisions related to traffic handling” such as where to establish “a micro cell to increase capacity” in a given area. *Id.* at 2:17-27. The method described in Yost involves “3 separate phases: a calibration phase, a capture phase, and a data analysis phase.” *Id.* at 6:37-39.

In the calibration phase, “test devices [] are placed within the coverage area of interest and a set of ‘calibration’ data points or signal strength measurements at each test site [] are taken.” *Id.* at 6:65-7:2. In the capture phase, “signal strength measurements for the MRs [] whose geographical distribution is desired” is collected. *Id.* at 8:3-5. In the data analysis phase, the data collected as part of the prior phases “may be analyzed to determine the positions of the MRs whose data was captured.” *Id.* at 8:39-41.

V. LEVEL OF ORDINARY SKILL IN THE ART

Patent Owner adopts Petitioner’s definition of a person of ordinary skill in the art (“POSITA”) for the purposes of this Preliminary Response. *See* Pet. at 6-7. Patent Owner reserves the right to present arguments on the definition should the Petition be instituted.

VI. CLAIM CONSTRUCTION

Patent Owner does not dispute Petitioner’s statement on claim construction for the purposes of this Preliminary Response. As explained below, however, the district court’s *Markman* order—which is the basis for Petitioner’s proposed constructions—further clarifies and gives meaning to these claim constructions. *Infra* § VII. Patent Owner reserves the right to present arguments on the constructions should the Petition be instituted.

VII. PETITIONER FAILS TO SHOW A REASONABLE LIKELIHOOD OF PREVAILING ON ANY CHALLENGED CLAIM

To the extent the Board considers the merits of the Petition, the Petition does not demonstrate that the combination of Bhattacharya and Yost renders obvious any of the challenged claims. All of the challenged claims of the ’753 Patent require “generating one or more sets of grid points for said calibration data,” or for the system claims, a processor programmed to “generate one or more sets of grid points for said calibration data.” Ex. 1001 at cls. 1, 7, 9, 32, 38, 40. There is no disclosure

in Bhattacharya or Yost that teaches this limitation nor do they render this limitation obvious.

As further explained above in Section III, the district court concluded that “grid point,” as used in the ’753 Patent, specifically refers to “a point associated with representative calibration data for an area” that is *generated based on analysis of calibration data*. Ex. 1020 at 20; *see also id.* at 19 (district court explaining that gathering and analyzing calibration data is “what *must be done* to arrive at a grid point or set of grid points” (emphasis in original)). The district court recognized that the ’753 Patent explains that “grid points do not necessarily have to be part of a uniform grid and usually will not be uniformly distributed throughout the geographic region,” and that such non-uniformly distributed grid points are more specifically referred to as “non-uniform grid points” or “NUGs.” Ex. 1001 at 2:43-50.

As confirmed by the district court’s *Markman* order explaining its adopted construction, that the claimed grid points are associated with “*representative calibration data*” necessarily requires them to be generated based on an analysis of the calibration data. *See supra* § III. Petitioner offers no explanation for how the representative calibration data could be defined and then associated with the grid point without analysis of the calibration data. Determining which calibration data is representative logically requires such analysis. Thus, the district court’s requirement that the claimed grid points be associated with “representative calibration data”

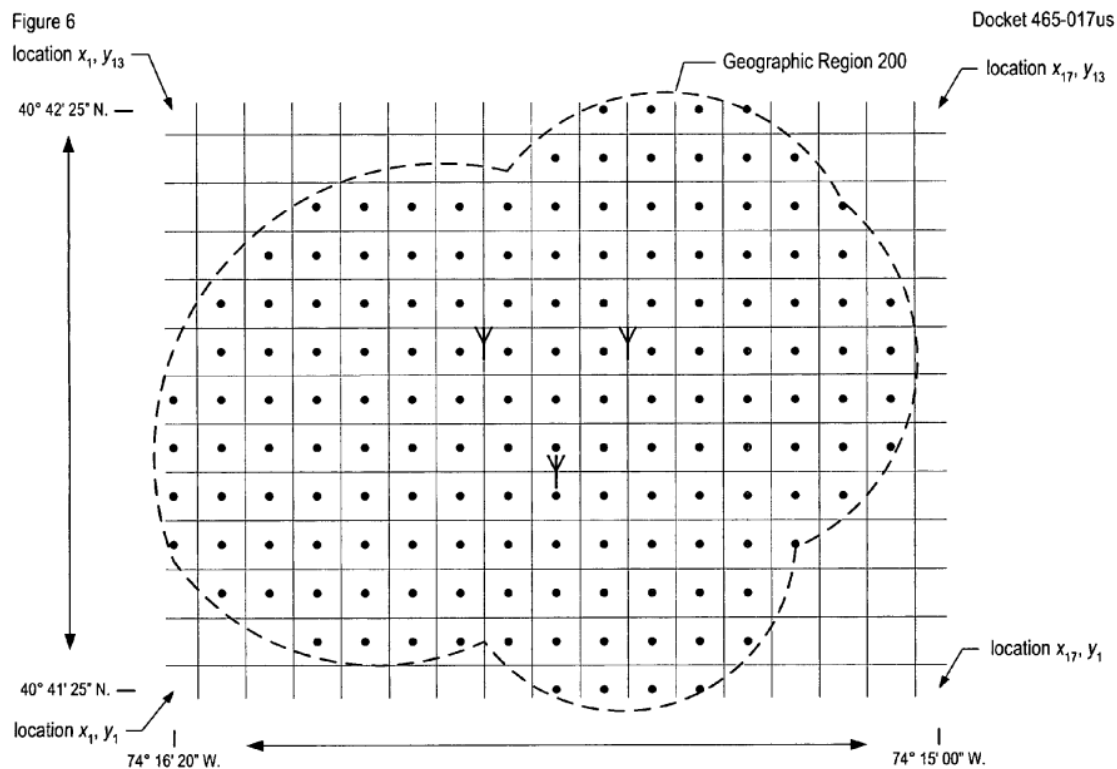
necessarily encompasses the requirement to generate the grid points based on analysis of the calibration data. The district court further confirmed this with its explanation that “representative calibration data” in its construction “reflect[s] that the defining characteristic of a NUG region ... is 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.” Ex. 1020 at 20 (citing Ex. 2016 at 3:56-60; Ex. 1001 at 10:29-11:6; Ex. 2017 at 6:22-28). In other words, the district court emphasized that “representative calibration data” in its adopted construction encompasses analyzing the calibration data to assess similarities and determine what data is representative so that it can be associated with a grid point. Accordingly, although the district court’s adopted construction (which Petitioner has proposed here) does not expressly use the words “analyzing calibration data,” such analysis is necessarily required by its construction.

Moreover, the claim language in the ’753 Patent recites that the one or more sets of grid points are generated “*for said calibration data*”—*i.e.*, the calibration data collected in the preceding step. Ex. 1001 at cls. 1, 32. Particularly in view of the specification, this further confirms that claimed grid points are generated based on analysis of the collected calibration data, consistent with the district court’s construction of the term. *See, e.g.*, Ex. 1001 at 2:31-35 (“The 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.”).

Petitioner relies primarily on Bhattacharya as teaching this limitation but it describes a fundamentally different approach than what is claimed in the ’753 Patent. Petitioner points to Bhattacharya’s disclosure of a step of populating an “Expected Signal-Strength Database” where “a rectangular grid of X by Y tessellated squares is overlaid onto geographic region 200” as satisfying the “[generating/generate] one or more sets of grid points for said calibration data” limitation. Pet. at 35-38, 51-52. But the complete claim limitation requires generating grid points “for said calibration data,” and thus, requires more than determining a location or point independent of any calibration data. And, as explained above, this requirement expressly recited in the claim limitation is consistent with the district court’s construction of “grid point” which inherently requires determining the grid points from analysis of the collected calibration data. Bhattacharya, on the other hand, only discloses overlaying onto a region a predefined grid of squares that is independent of any calibration data, and using the center of each square as a location to populate the Expected Signal-Strength Database. This fails to teach or render obvious the “[generating/generate] one or more sets of grid points for said calibration data” limitation of the challenged claims.

In particular, Bhattacharya describes the partitioning of a geographic region that Petitioner relies on as teaching this limitation as simply overlaying “a rectangular grid of X by Y tessellated squares ... onto geographic region 200.” Ex. 1004 at [0106]. An exemplary overlaid grid of Bhattacharya is shown in Figure 6, reproduced below.



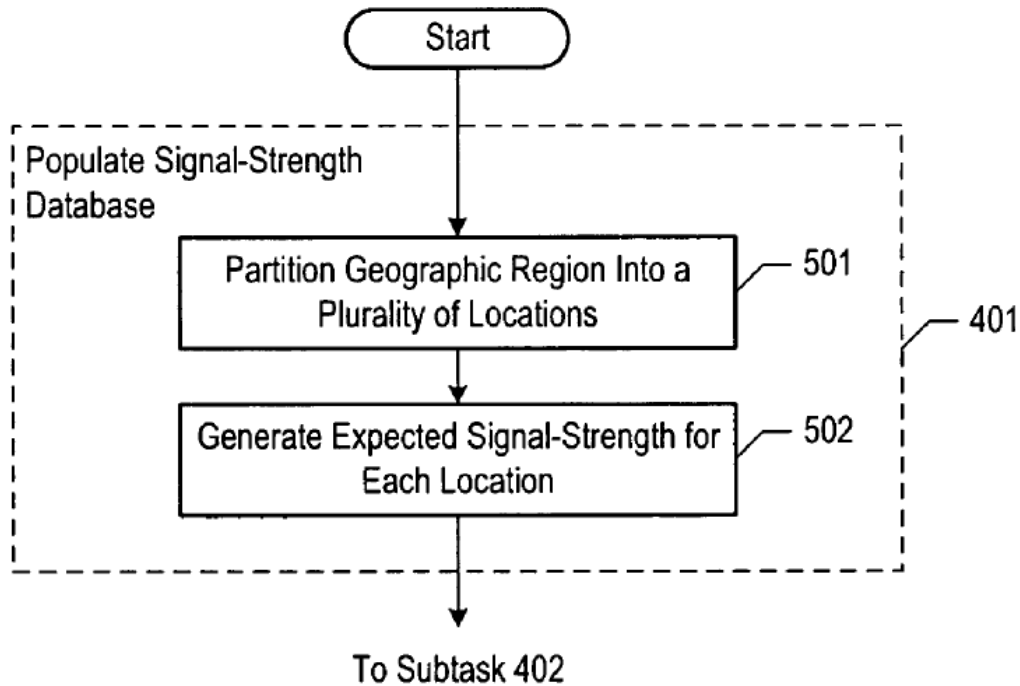
Id. at Fig. 6.

Bhattacharya teaches that the overlaying of this grid onto a geographic region is independent of any calibration data. Bhattacharya expressly states that “the size of the squares [in the overlaid grid] is *chosen* based on the following considerations,” including the desired “resolution” with which a wireless terminal

can be located, the tolerable “computational burden” of the process, and the margin for “errors in estimating the location” of a wireless terminal. *Id.* at [0107]-[0111]. None of these considerations used to define the overlaid grid of Bhattacharya are calibration data—they are considerations of how the system operates in terms of complexity and accuracy. Thus, by identifying these as the considerations used to define the overlaid grid, Bhattacharya teaches away from defining a grid based on the collected calibration data, as required by the ’753 Patent claims.

Similarly, Bhattacharya emphasizes the predefined nature of the overlaid grid, focusing on the “number and size of squares” or “another tessellated shape (e.g., triangles, rectangles, hexagons, etc.)” without any reference to that overlaying being based on the calibration data. *Id.* at [0111]. Thus, even when addressing alternative embodiments of its grid, Bhattacharya makes clear that the grid—regardless of the number, size, and shape used—is still independent of any calibration data.

Figure 5 of Bhattacharya further demonstrates the difference between the predefined grid of Bhattacharya and the “grid” of the ’753 Patent that is determined from analysis of the calibration data. Figure 5, reproduced below, “depicts a flowchart of the salient subtasks” involved in populating the “Expected Signal-Strength Database.” *Id.* at [0031], [0085], Fig. 5.



As seen in the figure, the partitioning of a geographic region via overlaying a grid onto the region occurs *before* the expected signal-strength for each location is generated. *See id.* at [0106] (explaining that subtask 501, referred to in Figure 5 as partitioning a geographic region into a plurality of locations, involves overlaying “a rectangular grid of X by Y tessellated squares” onto a geographic region). Thus, even if these expected signal-strengths constitute calibration data, Bhattacharya teaches that they are generated only *after* the predefined grid is created and overlaid onto a geographic region. This confirms that the overlaid grid of Bhattacharya is not based on an analysis of calibration data.

Petitioner relies on Bhattacharya’s teaching of “expected signal-strength functions” being generated from “the empirical measurements described by

Bhattacharya.” Pet. at 35 (citing Ex. 1004 at [0115]-[0117]). This is distinct, however, from generating the grid points from analysis of the calibration data. As seen in the related ’784 Patent which depicts grid points, the location and boundaries of the grid points themselves are determined from the calibration data, typically leading to a non-uniform distribution of the grid points:

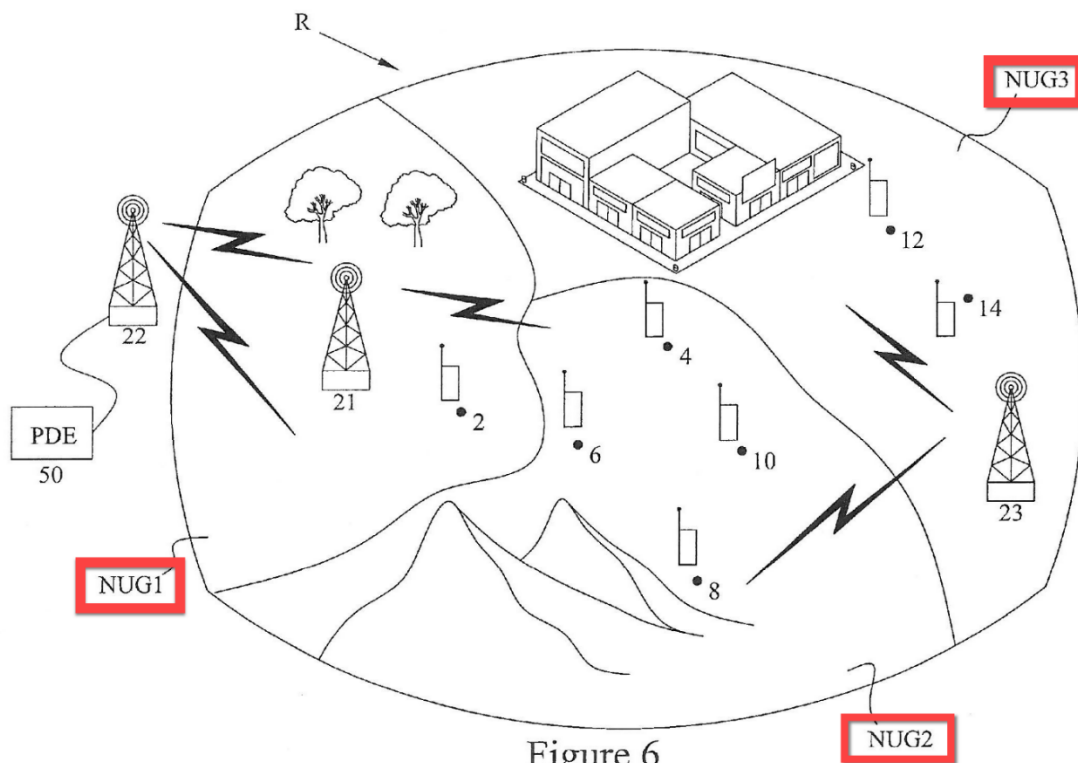


Figure 6

Ex. 2017 at Fig. 6; *see supra* § III.

In Bhattacharya, however, the location and boundaries of the squares in the grid are defined independently of any calibration data. In fact, as explained above, the location and boundaries of the squares in the grid are based on considerations regarding the operation of the system that are indisputably *not* calibration data.

Because of this Bhattacharya's grid is predefined and fixed based on such considerations whereas the "grid" of the '753 Patent depends on analysis of similarities in the collected calibration data. The substantial difference between these two approaches—and the resultant "grids"—is clear from Figure 6 of Bhattacharya and Figure 6 of the '784 Patent (which is related to the '753 Patent and depicts the claimed grid points), both shown above.

Petitioner's reliance on Yost does not remedy the deficiencies in Bhattacharya. Petitioner only points to Yost's discussion of using "testing devices[s]" to collect empirical measurements at various locations and alleges that a POSITA would have known from Yost to "average the multiple empirical measurements." Pet. at 37-38. None of this changes that the overlaid grid in Bhattacharya is entirely predefined based on considerations of the desired accuracy and complexity of the system rather than calibration data. Thus, even if Petitioner's contentions about what a POSITA would have understood from Yost are credited, they do not address this shortcoming in Bhattacharya. And Petitioner identifies nothing in Yost that independently teaches or renders obvious the "[generating/generate] one or more sets of grid points for said calibration data" limitation of the challenged claims.

Moreover, Petitioner fails to show how the combination of Bhattacharya and Yost satisfies the district court's construction of "grid point" requiring it to be

associated with “representative calibration data for an area.” Indeed, Petitioner does not even attempt to address the “representative calibration data” part of the “grid point” construction. For example, Petitioner does not explain how Bhattacharya or Yost teaches anything about “representative calibration data,” what it means for calibration data to be “representative,” how to evaluate whether calibration data is “representative,” or anything else that could plausibly satisfy this part of the construction. *See generally* Pet. at 35-38.

Notably, the district court—which adopted the construction that Petitioner proposed here—explained that “representative calibration data” in the construction reflects that “the defining characteristic of a NUG region ... 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.” Ex. 1020 at 20. Yet, Petitioner does not point to anything in Bhattacharya or Yost teaching evaluating the statistical similarity, or any other commonality, in the calibration data. Petitioner improperly disregards the “representative calibration data” portion of the construction, which is a fatal flaw in its argument. Accordingly, Petitioner fails to show that the combination of Bhattacharya and Yost renders obvious the claims of the ’753 Patent.

VIII. CONCLUSION

Petitioner fails to show that institution is warranted. As explained above, institution would require an inefficient use of the Board’s resources. A district court has already ruled that the ’753 Patent claims are unpatentable under § 101, and the Petition falls far short of presenting a “compelling unpatentability challenge” that would warrant proceeding despite that ruling.

Even if the Board reaches the merits under the lower “reasonable likelihood” standard, denial is still warranted. Petitioner fails to demonstrate that the asserted prior art teaches every limitation of the challenged claims. Petitioner relies on superficial arguments that fail to satisfy the claim constructions that Petitioner itself proposed. For the foregoing reasons, Patent Owner respectfully requests that the Board deny institution.

Dated: March 19, 2024

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

The undersigned certifies that this brief complies with the type-volume limitations of 37 CFR § 42.24(a)(1)(i). This brief contains 7,961 words as calculated by the “Word Count” feature of Microsoft Word, the word processing program used to create it. The undersigned further certifies that this brief complies with the typeface requirements of 37 CFR § 42.6(a)(2)(ii) and typestyle requirements of 37 CFR § 42.6(a)(2)(iii). This brief has been prepared in a proportionally spaced typeface using Microsoft Word in Times New Roman 14 point font.

Dated: March 19, 2024

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing Patent Owner's Preliminary Response, was served on March 19, 2024 *via* email directed to counsel of record for the Petitioner at the following address of record as listed on P-TACTS:

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