

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

GEOSCOPE TECHNOLOGIES PTE. LTD.,
Patent Owner

Case IPR2024-00255
U.S. Patent No. 7,561,104

PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE

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LIST OF EXHIBITS

APPLE-1001	U.S. Patent No. 7,561,104 to Alles et al. (“the ’104 Patent”)
APPLE-1002	Excerpts from the Prosecution History of the ’104 Patent (“the Prosecution History”)
APPLE-1003	Declaration and Curriculum Vitae of Dr. Karthikeyan Sundaresan
APPLE-1004	Complaint, Geoscope Technologies PTE. LTD. v. Apple Inc., 1-22-cv-01373 (E.D. Va.), Dec. 1, 2022
APPLE-1005	U.S. Pat. App. Pub. No. 2006/0211376 (“Bhattacharya”)
APPLE-1006	Qing-An Zeng & Dharma P. Agrawal, “Chapter 1 - Handoff in Wireless Mobile Networks,” “Handbook of Wireless Networks and Mobile Computing,” John Wiley & Sons, Inc., 2002, 1-25 (“Zeng”)
APPLE-1007	U.S. Pat. App. Pub. No. 2006/0240843 (“Spain”)
APPLE-1008	U.S. Pat. No. 6,799,047 (“Bahl”)
APPLE-1009	U.S. Patent No. 7,783,299 (“Anderson”)
APPLE-1010	Special Mobile Group (SMG) Technical Committee (TC), European Telecommunications Standards Institute, GSM Technical Specification - Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 specification (GSM 04.08) (Dec. 1995)
APPLE-1011	U.S. Patent No. 6,560,442 (“Yost”)
APPLE-1012	Nico Deblauwe, “GSM-based Positioning: Techniques and Applications, 2008, IBSN: 9789054874942 (“Deblauwe”)
APPLE-1013	Declaration of June A. Munford

APPLE-1014- APPLE-1049	RESERVED
APPLE-1050	Memorandum, Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation (USPTO June 21, 2022) (“Interim Procedure”)
APPLE-1051	Memorandum Opinion dated Sept. 18, 2023, Geoscope Technologies PTE. LTD. v Apple Inc., 1:22-cv-01373, (E.D. VA.)
APPLE-1052	Stipulation Regarding Agreed Upon Claim Constructions, Geoscope Technologies PTE. LTD. v Apple Inc., 1:22-cv01373, (E.D. VA. May 23, 2023)
APPLE-1053	Notice of Appeal dated Sept. 25, 2023, Geoscope Technologies PTE. LTD. v Apple Inc., 1:22-cv-01373, (E.D. VA.)
APPLE-1054	Memorandum Opinion & Order, Geoscope Technologies PTE. LTD. v Apple Inc., 1:22-cv-01373, (E.D. VA. Jul. 19, 2023)
APPLE-1055	Supplemental Declaration of Dr. Karthikeyan Sundaresan
APPLE-1056	Deposition Transcript of Alan Sturza (November 7, 2024)

I. INTRODUCTION

Acknowledging weakness in the '104 patent, Geoscope disclaimed claims 1, 3, and 11 in submitting its Patent Owner Response ("POR"). Only claims 2, 4 and 6-10 remain at issue, though the POR limits its focus to claim 2. *See* POR, 59-66.

But claim 2 fares no better. Each of Geoscope's purported prior art distinctions are entirely premised on an improper construction of "non-uniform grid points" ("NUGs"). This construction ignores the Panel's construction, which is both consistent with plain meaning and the intrinsic record. Dec., 28.

Geoscope's alternative construction is the opposite. It departs from the plain meaning by injecting words not recited by claim 2. Nor is it supported by the intrinsic record because there is no evidence of clear and unmistakable disclaimer, disavowal, or redefinition. It is also rooted in Geoscope's misapprehension that disclosure within a provisional application alone provides sufficient justification for narrowing claim scope. That is not the law. As discussed in §II.A, *infra*, the Federal Circuit has clarified that provisional application disclosure may be relevant to claim construction if such disclosure is present in the specification of an issued patent. Geoscope fails to demonstrate satisfaction of this condition in this proceeding.

With limited available defenses, Geoscope concocts superficial reasons for avoiding the instituted grounds. First, Geoscope alleges prejudice in disputing the

level of ordinary skill identified in the declaration of Apple's expert, Dr. Karthikeyan Sundaresan ("Sundaresan Declaration"). But the POR identified an alternative POSITA definition, effectively inoculating any such allegations of prejudice. This alternative POSITA definition, even if adopted by the Panel, is similarly consistent with the instituted grounds. Geoscope's criticisms regarding the appropriate level of skill therefore reveals a distinction without a difference—obviousness of the Challenged Claims is demonstrated under either POSITA definition.

Geoscope then complains about the Sundaresan Declaration and urges the Panel to disregard it entirely. Here again, Geoscope places undue emphasis on form over substance, focusing narrowly on language used to describe Dr. Sundaresan's opinions rather than meaningfully rebutting them. It is unable to identify any conclusory testimony regarding anticipation or obviousness, and therefore is forced to focus on opinion testimony regarding the level of ordinary skill and claim constructions adopted in multiple venues. To the extent there is any alleged gap in the evidentiary record,¹ they are addressed by a supplemental declaration from Dr. Sundaresan being submitted with this paper. *See* APPLE-

¹ Testimony in the Sundaresan Declaration alone is sufficient to support the grounds of unpatentability of claims 2, 4, and 6-10.

1055.

For the reasons discussed in this Reply, the Panel should find claims 2, 4 and 6-10 unpatentable.

II. THE PANEL’S CONSTRUCTION OF “NON-UNIFORM GRID POINTS” IS APPROPRIATE

Despite different constructions for NUGs, the Panel’s construction is more closely tied to plain meaning. The term “non-uniform grid points” refers to a type of “grid point.” The adjective “non-uniform” modifies the underlying term “grid point,” which, as explained in the Petition, was construed in a counterpart proceeding to mean “a point associated with representative calibration data for an area.” Pet., 2 (citing APPLE-1054). Because an individual “grid point” represents “a point...for an area,” under plain meaning, the term “non-uniform grid points” reflects a type of spacing of multiple grid points within a corresponding area, and specifically, a *non-uniform* spacing. See APPLE-1055, ¶¶32-36. This reflects the full scope of the term within the intrinsic record. See §II.A.1, *infra*.

In contrast, Geoscope’s alternative construction seeks a departure from this plain meaning without any evidence of clear and unmistakable disclaimer, disavowal, or redefinition. *Avid Tech., Inc. v. Harmonic, Inc.*, 812 F.3d 1040 (Fed. Cir. 2016); *Thorner v. Sony Computer Ent. America LLC*, 669 F.3d 1362, 1366-67 (Fed. Cir. 2012). It is also unjustifiably narrow based on the specification. See

§§II.A.2-3, *infra*.

A. The Intrinsic Record Reinforces the Panel’s Construction And Demonstrates Geoscope’s Alternative Construction is Unjustifiably Narrow

1. *The Panel’s Construction is Consistent With the Specification*

The Panel’s construction is appropriate given the usage of NUGs within the intrinsic record. Dec., 28; *see* APPLE-1055, ¶37-38.

For example, the specification explains that different NUGs “may be separately defined by a variety of parameters.” APPLE-1001, 3:61-4:6. These “parameters” are expressed as two examples that each represent a “factor in deciding the boundaries of a NUG.” *Id.* The first factor is “geographical areas (e.g., mountains, buildings, roads)....” *Id.* NUGs with boundaries decided based on this factor (geographic areas) are included in the Panel’s construction because “the boundaries are naturally spaced according to the terrain’s contours and obstructions (rather than a uniform pattern)[,]” which “leads to non-uniform spacing of individual NUGs throughout a region.” *See* APPLE-1055, ¶39. The other factor is “varying concentrations of [mobile stations (MSs)].” APPLE-1001, 3:61-4:6. Likewise, NUGs with boundaries decided based on varying concentrations of mobile stations are also included in the Panel’s construction because “[i]f a region includes different types of areas (e.g., a region that includes an urban center and a suburban area), then variability in mobile station

concentrations within the region leads to irregular, or non-uniform, spacing of grid points across the region.” *See* APPLE-1055, ¶40.

A POSITA would have thereby understood “different” types of NUGs may exist, and at least some of these types have boundaries that may be determined without necessarily evaluating calibration data. *See* APPLE-1055, ¶¶41-47.

Geoscope’s expert, Mr. Alan Sturza, confirmed this understanding in deposition. When asked if “attributes of a geographic area” may be used to determine NUG boundaries, he explained “unsurprisingly mountains, buildings and roads, you know, and other geographical features would come into play.” APPLE-1056, 43:8-20. Thus, testimony from both expert witnesses confirms that a POSITA would have understood that the NUG boundaries may be determined from geographical attributes/features (e.g., mountains, buildings, roads).

The specification also indicates that a NUG “may represent the signal characteristics and/or calibration data over a given region.” APPLE-1001, 3:50-60. A POSITA would have recognized that this description contemplates NUGs as representing information, e.g., “signal characteristics,” “calibration data,” over a geographic region. *See* APPLE-1055, ¶46. Each type of information is encompassed by the Panel’s construction because they reflect “unique, spatially variable factors that may not be uniformly spaced across a geographic region.” *Id.*, ¶47; *see* Dec., 28. That is, regardless of whether a NUG represents “signal

characteristics” or “calibration data,” that NUG may still include “grid points that are non-uniformly spaced throughout a geographic region.” *See* APPLE-1055,

¶47. Mr. Sturza similarly agreed. APPLE-1056, 40:9-18; *see id.*, 36:1-38:13; *see also* 44:11-16.

2. *The Narrow Scope of Geoscope’s Alternative Construction is not Justified by the Specification*

Geoscope asks the Panel to set aside its construction and instead adopt an alternative construction where a NUG is “a point associated with representative calibration data for an area whose boundaries are determined from **evaluation of the calibration data**.” POR, 25-26 (emphasis added). But this narrows claim scope in a manner that is inconsistent with the specification. *See* APPLE-1001, 3:50-4:6.

As previously noted, the specification teaches two examples of factors in “deciding the boundaries of a NUG,” neither of which necessarily requires evaluation of calibration data. APPLE-1001, 3:61-4:6. The first factor, “geographical areas (e.g., mountains, buildings, roads),” is not limited to evaluation of calibration data because NUG boundaries may instead be based on, for example, “static characteristics of a physical environment, such as the presence of a mountain or a building within a region.” *See* APPLE-1055, ¶42.

The second factor (“varying concentrations of [mobile stations]”) similarly

is not limited to evaluation of calibration data because NUG boundaries may instead be based on, for example, “a distribution of mobile stations within a region.” APPLE-1055, ¶43. Dr. Sundaresan also explains why boundary determination based on either of these factors does not require evaluation of calibration data. *See id.*, ¶¶48-50.

Thus, Geoscope’s alternative construction excludes embodiments in the specification where NUG boundaries are determined based on geographic attributes without any clear and unambiguous disclaimer within the intrinsic record. Absent such clear and unambiguous disclaimer, claim constructions that exclude embodiments are improper. *Oatey Co. v. IPS Corp.*, 514 F.3d 1271, 1276 (Fed. Cir. 2008) (“We normally do not interpret claim terms in a way that excludes embodiments disclosed in the specification”); *see also Verizon Servs. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1305 (Fed. Cir. 2007); *Invitrogen Corp. v. Biocrest Mfg., L.P.*, 327 F.3d 1364, 1369 (Fed. Cir. 2003).

3. *The ’379 Provisional Similarly Fails to Justify Narrowing Claim Scope*

Geoscope also attempts to leverage a provisional application in the priority chain of the ’104 patent—the ’379 Provisional (EX-2029)—to support its alternative construction. The POR cites exclusively to pages 5-7 of EX-2029, and in doing so, omits relevant disclosure (on page 8) confirming that Geoscope’s

alternative construction is unjustifiably narrow.

Pages 5-7 of EX-2029 includes descriptions that “[t]he geometrical shape 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” (EX-2029, 7, cited in POR, 12-13). *See also* POR, 36-40. However, page 8 (uncited in the POR) further states “additionally, we also consider the method of generating NUGs based not on statistical consistency but on other conditions...” EX-2029, 8 (emphasis added). Page 8 thereby confirms the inventors clearly did not limit the scope of techniques of NUG boundary determinations to only those involving use of “statistical similarity.” *See* APPLE-1055, ¶¶51-54.

Page 8 of EX-2029 further notes that NUG boundary determination may be based on “other conditions” that are “combined with” the “method of using statistical consistency or similarity.” EX-2029, 8 (emphasis added). This language unambiguously confirms that techniques described in pages 5-7 of EX-2029 (and relied upon by Geoscope) are distinct from “additional[]” techniques described in page 8, where NUG boundary determination is based on “other conditions” and not “statistical consistency or similarity.” APPLE-1055, ¶54. Contrary to Geoscope’s allegations, the ’379 Provisional fails to provide any evidence of clear and unmistakable disclaimer, disavowal, or redefinition to depart from plain

meaning.

Worse, the Sturza Declaration fails to acknowledge or address the descriptions within page 8 of EX-2029 discussed above. *See* APPLE-1056, 57:3-58:15. In deposition, Mr. Sturza indicated that he “didn’t review the entire provisional,” and instead “took into account everything that...[he] believed was relevant to providing an opinion...” *Id.*, 58:3-15. Geoscope therefore fails to avail the record of any evidence regarding the ’379 Provisional that disrupts the Panel’s construction.

B. Geoscope’s Alternative Construction Also Cannot be Supported As a Matter of Law

Beyond the deficiencies discussed above, Geoscope also fails to justify its alternative construction because the POR relies on factually-distinguishable authority for legal support. Citing to *Trs. of Columbia Univ. in City of New York v. Symantec Corp.*, 811 F.3d 1359 (Fed. Cir. 2016) (“*Columbia*”), the POR broadly contends that disclosure in a provisional application is generally relevant to claim construction. POR, 24. *Columbia* is inapplicable for at least two reasons.

First, in *Columbia*, the provisional application disclosure found relevant for claim construction was deemed definitional. *See Columbia*, 811 F. 3d at 1365-66 (referencing disclosure as “not simply descriptions of the preferred embodiment but are statements **defining**” a disputed term, and finding “[f]urther, the

provisional application **similarly defined**” the disputed claim term) (emphasis added); *see also Advanced Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1282 (Fed. Cir. 2000). In this proceeding, Geoscope fails to identify any express definition of “non-uniform grid points” within the intrinsic record.² Geoscope’s reticence is unsurprising because, as previously discussed in §II.A, *supra*, the intrinsic record does not include any clear and unmistakable disclaimer, disavowal, or redefinition. *See* §II.A, *supra*.

Columbia is also inapplicable because the relevance of provisional application disclosure was premised on its presence in the specification. *See Columbia*, 811 F. 3d at 1365-66 (“**Twice in the specification**, the patentee states that the ‘byte sequence feature’ is useful and informative ‘because it represents the machine code in an executable’”) (emphasis added). Here, while Geoscope urges certain descriptions from the ’379 Provisional as being a “fundamental aspect of the claimed non-uniform grid points,” these descriptions are entirely absent from the specification. POR, 27, 33-34; APPLE-1055, ¶15.

² Tellingly, despite using the word “definition” fourteen times in other contexts, the POR never advocates for any of the supporting descriptions from the intrinsic record as rising to the level of express and unambiguous definition. *See* POR, 9-16, 23-38.

Moreover, had these descriptions been “fundamental,” the examiner would have asserted that the claims lack adequate written description under § 112(a) because the corresponding description—i.e., evaluation of statistical similarity within calibration data in determining NUG boundaries—is absent from both the claims and the specification. *See* MPEP 2172.01; *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976)). To rectify this, the examiner would have insisted that the applicant amend the specification to include the “essential matter” found in the ’379 provisional needed to support the claims. Because no such action was taken, the examiner simply did not believe that the ’379 Provisional’s description that “evaluation of [] data vectors is of great importance since it is fundamental to the method” is “essential matter” needed to properly discern claim scope. EX-2029, 6.

Subsequent Federal Circuit decisions also undermine Geoscope’s reliance on *Columbia*. In *MPHJ Tech. Invs. v. Ricoh Ams. Corp.*, 847 F.3d 1363 (Fed. Cir. 2017) (“*MPHJ*”), the Federal Circuit distinguished *Columbia* because “[i]n this case, it is the **deletion from the ’798 Provisional application** that contributes understanding of the intended scope of the final application.” *MPHJ*, 847 F.3d at 1369 (citing *Columbia*) (emphasis added).

Here, like the specification at-issue in *MPHJ*, the specification “in its final form contains no statement or suggestion of an intent to limit the claims” and

“[n]either the specification nor the claims state that this limited scope is the only intended scope.” *Id.* And, consistent with the rationale expressed in *MPHJ*, the specification is in “accord with the change from the [Provisional Application] to the final patent[,]” and thus, “[a] person skilled in this field would reasonably conclude that the inventor intended that” generation of non-uniform grid points based on evaluation of calibration data would be “optional, not obligatory.” *Id.*

Further, to the extent that descriptions from the '379 Provisional relied upon in the POR are deemed definitional (they are not), deletion from the specification confirms such descriptions should not limit the scope of NUGs recited in claim 2. *See Finjan LLC v. ESET, LLC*, 51 F.4th 1377, 1382-83 (Fed. Cir. 2022) (“The use of a restrictive term in an earlier application does not reinstate that term in a later patent that purposely deletes the term, even if the earlier patent is incorporated by reference.”). The Federal Circuit has also found that later-filed applications deleting a definition within a grandparent patent did not incorporate the definition. *Modine Mfg. Co. v. U.S. Int'l Trade Comm'n*, 75 F.3d 1545, 1553 (Fed. Cir. 1996).

C. The Petition's Application of Spain is Consistent With the Panel's Construction

Properly construed, the Petition demonstrates satisfaction of the “non-uniform grid points” under the Panel's construction. The Petition explains that, in Spain, locations within a region may “have different shapes and sizes, and

represent different areas” of the region. Pet., 70-71; APPLE-1003, ¶142. Thus, the partitioning of a region within Spain that provides these different shapes and sizes renders the NUGs recited in claim 2 obvious. That is, such partitioning provides “grid points that are non-uniformly spaced throughout a geographic region.” Dec., 28; *see* Pet., 68-71; APPLE-1003, ¶¶139-43; *see also* APPLE-1055, ¶¶55-58.

The Petition’s application of Spain is even consistent with examples of techniques for determining NUG boundaries described within the specification. Spain describes boundaries of partitioned regions being based on various factors, including “natural and man-made physical attributes of [a] geographic region.” APPLE-1007, [0086]; *see* Pet., 13 (fn 3) (citing the same); POR, 60-61. This coincides with the specification, which teaches that “a factor in deciding the boundaries of a NUG” include “geographical areas (e.g., mountains, buildings, roads).” APPLE-1001, 3:61-4:6. Thus, Spain and the specification each describe the same technique of determining partitioned boundaries using geographic attributes. APPLE-1055, ¶¶55-58; *compare* APPLE-1056, 41:16-44:16 (Mr. Sturza’s testimony relating to the specification) *and* 68:16-71:9 (Mr. Sturza’s testimony relating to Spain).

III. RECORD EVIDENCE DEMONSTRATES AN APPROPRIATE LEVEL OF ORDINARY SKILL

A. Geoscope’s Allegations of Procedural Defects Lack Merit

Geoscope broadly alleges that “[t]he Petition does not address the level of

ordinary skill[.]” (POR, 40) and that “Dr. Sundaresan is not providing his opinion on level of ordinary skill...” (*id.*, 42). But these allegations are without merit. Geoscope suffers no prejudice since it proposes an alternative POSITA definition and fails to identify authority to support its theory that the Petition is procedurally deficient. *See* §III.C, *infra*.

Geoscope’s identification of an alternative POSITA definition demonstrates awareness of a level of ordinary skill sufficient to permit a comparison of the asserted prior art and the features claimed in the ’104 patent. No prejudice also exists because, under any reasonable read of the Sundaresan Declaration, Dr. Sundaresan implied agreement with the POSITA definition based on its inclusion in a signed declaration. The Panel understood this as, upon assessing the preliminary record, found that the definition proposed by Dr. Sundaresan to be “reasonable and consistent with the ’104 patent specification and the prior art.” *See* Dec., 7. Dr. Sundaresan also reaffirms agreement with the original POSITA definition. APPLE-1055, ¶¶17-18; *see* §III.B, *infra*.

Further, mere disagreement with a POSITA definition does not rise to the level of “defects” that, according to Geoscope, “require[s] the Board to find all challenged claims not unpatentable.” POR, 43. Instead, as the Federal Circuit has explained, “[w]hile it is always preferable for the factfinder below to specify the level of skill it has found to apply to the invention at issue, **the absence of specific**

findings on the level of skill in the art does not give rise to reversible error

‘where the prior art itself reflects an appropriate level and a need for testimony is not shown.’” *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). Indeed, the Panel similarly acknowledged that “Petitioner’s proposal [is] reasonable and consistent with the ’104 patent specification and the prior art.” Dec., 7. Further, as discussed in §III.B, *infra*, the asserted prior art also reflects an “appropriate level of skill in the art,” and their disclosures reflect knowledge of “cellular technologies or telecommunications,” which Geoscope urges is critical to the level of ordinary skill. *See* POR, 45.

B. Record Evidence Confirms the Original POSITA Definition is Appropriate

The Sundaresan Declaration explained that the definition of POSITA is a person with an educational background in “electrical engineering, computer science, or a similar discipline, and at least two years of experience in the field working with navigation and/or geolocation systems.” APPLE-1003, ¶8. Experience working with “navigation and/or geolocation systems” would have encompassed knowledge of “radio frequency and cellular technologies,” as demonstrated by each of the specification and asserted prior art (e.g., Bhattacharya).

As to the specification, disclosure of well-known cellular protocols

demonstrates that knowledge of “radio frequency and cellular technologies” was within the skill level of the POSITA definition applied in the Petition. The specification acknowledges that “[t]he use of wireless communication devices such as telephones, pagers, personal digital assistants, laptop computers, etc., hereinafter referred to collectively as ‘mobile appliances’ or ‘mobiles stations’ has become prevalent in today’s society.” APPLE-1001, 1:20-27. And, while the specification identifies examples of cellular standards—e.g., “TDMA, GSM, 3GPP”—it otherwise did not disclose or suggest the types of complexities identified in the POR. *See id.*, 4:28-40. The specification also fails to provide implementation detail regarding how its system receives or otherwise derives signal strength parameters from cellular networks, confirming that such detail was known by a POSITA familiar with geolocation systems. Mr. Sturza’s deposition testimony confirms the same. *See* APPLE-1056, 17:21-18:3, 21:17-19, 24:2-6, 24:12-18, 26:5-29, 28:5-29:1, 29:8-30:10; *see also* APPLE-1055, ¶¶17-23.

The asserted prior art also demonstrates that use of cellular technology in geolocation systems was within the skill level of a POSITA (as originally defined). Bhattacharya identifies in its Background section an example of a system that is “serviced by a wireless telecommunications system, which provides wireless terminals (e.g., wireless terminal 101) within the region.” APPLE-1005, [0002]. Like the specification, Bhattacharya teaches use of GSM for geolocation and

further recognizes that “it will be clear to those skilled in the art how to make and use alternative embodiments of the present invention that operate in accordance with other protocols...” *Id.*, [0052]. Bhattacharya thereby confirms use of “radio frequency and cellular technologies” in geolocation represented implementation details by its filing date. *See* APPLE-1055, ¶¶24-25; *see also* APPLE-1056, 63:13-16, 64:16-65:3. The POR also suggests the same by recognizing that “geolocation using RF signals (e.g., **cellular data**, as opposed to, for example, GPS information) **was of interest in the field**.” POR, 5 (emphasis added); *see* EX-2018, ¶54; *see* APPLE-1055, ¶26.

C. The Petition Demonstrates Obviousness Even Under Geoscope’s Alternative POSITA Definition

The Petition demonstrates unpatentability irrespective of the dispute regarding the POSITA definition because the asserted prior art is nonetheless pertinent to each definition. *See* POR, 22-23 (citing IPR2024-01209, Pap. 2, 13). Bhattacharya describes its invention as relating to “wireless networks, cellular radio systems, mobile communication devices, and radio navigation systems.” *See* APPLE-1005, [0001], [0002], FIG. 1; APPLE-1007, [0001], [0002], FIG. 1. As discussed in §III.B, *supra*, the asserted prior art also references well-known cellular protocols and thereby encompass the “wireless networks, cellular radio systems, mobile communication devices and radio navigation systems” referenced

in Geoscope's alternative POSITA definition. *See* APPLE-1005, [0001], [0002], [0052], FIG. 1; APPLE-1007, [0001], [0002], FIG. 1; *see* APPLE-1055, ¶¶27-31.

D. The Sundaresan Declaration Should be Credited

The Sundaresan Declaration provides a reasoned analysis for the asserted prior art. This analysis lacks conclusory allegations regarding obviousness or inherency, as demonstrated by Geoscope's inability to identify any specific instances of such testimony. *See* POR, 52-59. Geoscope instead labels two aspects of the Sundaresan Declaration as alleged deficiencies: (1) "opinion, on the level of ordinary skill" and (2) "opinions on claim interpretation." POR, 53-54. Neither of these alleged deficiencies were at-issue in the authority cited in the POR.

Geoscope's reliance on the Director Review Decision in IPR2022-00624 is inapposite because, there, a petitioner sought Director Review in response to institution denial, and where such review resulted in affirmance of a panel's decision to deny institution based on evidentiary deficiencies because "Petitioner's arguments regarding inherency and obviousness were supported only by its expert declaration" (Pap. 12, 2) and the expert declaration was "unsupported by evidence or reasoning" (*id.*, 4). The Director then found that "the Board was correct in giving little weight to Petitioner's expert because the expert declaration merely offered conclusory assertions without underlying factual support and repeated,

verbatim, Petitioner’s conclusory arguments.” *Id.*, 5. Here, the POR makes no effort to identify any conclusory arguments regarding inherency and obviousness in the Sundaresan Declaration. Dec., 23-24.

Geoscope also misapplies *TQ Delta, LLC v. Cisco Sys.*, 942 F.3d 1352 (Fed. Cir. 2019) (“*TQ Delta*”) in urging that alleged “blanket adoption” of a POSITA definition in the Sundaresan Declaration provides a legitimate basis to disregard the entirety of the opinion testimony within it. POR, 53; 942 F.3d 1352 (Fed. Cir. 2019). Read in context, the Court’s analysis in *TQ Delta* was concerned with conclusory expert testimony relating to prior art teachings, e.g., testimony to “establish a motivation to combine the asserted prior art references,” testimony “regarding patent invalidity,” and testimony regarding “whether it would have been obvious to modify” the prior art. *See id.*, 1355-61. As noted above, the POR is unable to identify any of these types of deficiencies in the Sundaresan Declaration.

Finally, the record evidence still demonstrates unpatentability of the Challenged Claims regardless of whether the portions of the Sundaresan Declaration discussed in the POR are credited. The two types of alleged deficiencies in the Sundaresan Declaration are not evidentiary gaps because Geoscope overlooks other aspects of the record evidence. As recognized by the Panel, even if a POSITA definition is deemed lacking in the Sundaresan

Declaration (it is not), other evidence—such as the disclosures of the asserted prior art—each may “reflect an appropriate level of skill in the art.” *See* Dec., 7-8 (citing *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001)); *see also* §III.B, *supra*. As to claim construction, regardless of the Sundaresan Declaration, the intrinsic record still supports the Panel’s construction of NUGs. Dec., 28; *see* §II.A, *supra*.

IV. THE ASSERTED PRIOR ART RENDERS CLAIM 2 UNPATENTABLE

As explained in §II.C, *supra*, properly construed, the Petition demonstrated satisfaction of NUGs under the Panel’s construction. Specifically, based on the specification (*see* Pet., 68-69), NUGs recited in claim 2 are rendered obvious by Spain’s disclosure of partitioning that provides “different shapes and sizes, and represent different areas” of a region. Pet., 70-71 (citing APPLE-1007, [0076]-[0082]); APPLE-1003, ¶142.

The POR largely repeats the same three purported distinctions previously advanced in the Preliminary Response (“POPR”). *Compare* POPR, 33-43 and POR, 59-66. The Panel has explained that these purported distinctions neither “persuasively undermine Petitioner’s showing” nor “persuasively address why Petitioner’s overall explanation is incorrect or inadequate.” Dec., 32-33. The Sturza Declaration is similarly flawed as it repeats the same analysis in the POPR

and POR and fails to introduce any new evidence disrupting the preliminary findings within the Institution Decision. *See* EX-2018, ¶¶128-38.

The three distinctions in the POR are also premised on Geoscope’s alternative construction of NUGs. But this alternative construction departs from plain meaning without any evidence of clear and unmistakable disclaimer, disavowal, or redefinition within the intrinsic record. Thus, each of POR’s three purported distinctions fail under the Panel’s construction, and Geoscope is unable to demonstrate patentability of claim 2 based on the application of Spain in the Petition.³ APPLE-1055, ¶¶71-73.

V. A POSITA WOULD HAVE BEEN MOTIVATED TO COMBINE BHATTACHARYA AND ZENG WITH A REASONABLE EXPECTATION OF SUCCESS

A. Bhattacharya-Zeng is Sufficiently Motivated with a Reasonable Expectation of Success

As noted in the Petition, Bhattacharya suggests handoff functionality improving “location estimation ‘when a wireless terminal is near the boundary of one or more systems.’” Pet., 24 (citing APPLE-1005, [0054]). Bhattacharya thereby motivates combination with Zeng through recognition of using handoff

³ Tellingly, neither the POR nor the Sturza Declaration provide analysis of Spain based on the Panel’s construction of “non-uniform grid points.” *See* POR, 59-66; EX-2018, ¶¶128-38.

functionality with its system. For example, in paragraph [0095], Bhattacharya teaches that wireless switching center 211 may be configured to use the “GSM protocol and the mobile-assisted hand-off process” to receive “Signal-Strength Measurement Reports” “**in a well-known fashion.**” APPLE-1005, [0095] (emphasis added). Bhattacharya’s reference to “IS-41 protocol” in paragraph [0054] is further evidence of supporting handoff functionality. *Id.*, [0054]. Thus, the mobile-assisted handoff procedures enabled by Bhattacharya-Zeng are consistent with Bhattacharya’s disclosures in at least [0054] and [0094]. *See* APPLE-1055, ¶58.

Further, “Zeng references ‘mobile assisted handoff’ as one type of handoff decision-making,” which the Petition explained would have led a POSITA to “perceive[] this teaching to be relevant to Bhattacharya’s wireless switching center 211.” Pet., 24-25 (citing APPLE-1006, 4; APPLE-1005, [0095]). Again, this understanding is supported by paragraph [0095] of Bhattacharya, which explains that the wireless switching center 211 is “capable of relaying [] packet data,” and therefore would be understood to “implement[] the mobile-assisted hand-off process.” APPLE-1005, [0095]. And, “[w]hen combined, Bhattacharya-Zeng would have enabled an improved wireless switching center that incorporates the handoff functionality described in Zeng to thereby improve service ‘when a wireless terminal is near the boundary of one or more systems’ (as described in

Bhattacharya).” Pet., 25 (citing APPLE-1005, [0054]).

In other words, Bhattacharya-Zeng is a combination of known elements (the Bhattacharya system, including wireless switching center 211) according to known methods (handoff functionality in a switching center known to facilitate handoff) to achieve predictable results (modified Bhattacharya system incorporating Zeng’s handoff functionality to improve location estimation near boundary conditions). *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007). Bhattacharya-Zeng is also the application of a known technique to a known device ready for improvement to yield predictable results. *Id.*, 401. Specifically, Zeng’s hand-off functionality (known technique) is applied to Bhattacharya’s wireless switching center 211 (known device ready for improvement) to yield a predictable improvement in performing location estimation near boundary conditions (as suggested in Bhattacharya). APPLE-1003, ¶¶66-76; *see* APPLE-1055, ¶¶55-64.

Further, Bhattacharya-Zeng involves conventional aspects of handoff functionality known to be used in geolocation systems. These aspects were within the skill level of a POSITA—whether as defined based on the Sundaresan Declaration or instead on Geoscope’s alternative POSITA definition. *See* §III, *infra*; *see also* APPLE-1055, ¶¶65-70. Indeed, Bhattacharya’s description in [0095] would have indicated to a POSITA that use of mobile-assisted handoff procedures were known to support location estimation techniques based on

geolocation. APPLE-1055, ¶¶65-70. Thus, a POSITA would have had a reasonable expectation of success in combining the teachings of Bhattacharya and Zeng. *Id.*

B. Geoscope Fails to Rebut Record Evidence of Combinability

Ignoring Bhattacharya, Geoscope instead speculates that incorporation of Zeng’s handoff functionality would have created complexity for the Bhattacharya system. Geoscope broadly states that “handoff functionality in cellular networks is specified by complex standards that must be closely followed.” POR, 52. But this focuses on implementation details—compliance with different cellular standards in enabling handoff functionality—as confirmed by supporting testimony in the Sturza Declaration. *See* EX-2019, ¶127 (“Different protocols have different methods for performing handoffs to ensure interoperability and efficiency.”). Neither Geoscope nor Mr. Sturza ultimately explain why such compliance could not be achieved using routine knowledge and without undue experimentation. The Sturza Declaration seemingly acquiesces that the only basis for Geoscope’s alleged complexity regarding Bhattacharya-Zeng is rooted in a superficially high skill level imposed on the original POSITA definition. *See id.*, ¶126; *see also* APPLE-1055, ¶69.

Geoscope’s mandate for Bhattacharya-Zeng to incorporate specific types of hardware relating to handoff functionality amounts to requiring bodily

incorporation. But the bedrock of obviousness is “what the combined teachings of those references would have suggested to those of ordinary skill in the art,” not “whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference.” *In re Keller*, 642 F.3d 413, 425 (CCPA 1981). The Board has also found arguments assuming bodily incorporation unpersuasive and inconsistent with assertions in the Petition. *See, e.g.*, IPR2017-00705, Pap. 87, 52-53 (PTAB July 31, 2018). Thus, Geoscope’s position regarding Bhattacharya-Zeng is both factually and legally incorrect—factually incorrect because it presupposes that the combination demands a superficially high level of skill, and legally incorrect because it improperly requires bodily incorporation from Zeng into Bhattacharya.

Geoscope also mischaracterizes Bhattacharya and Zeng in contending they are “concerned with” different things. POR, 48. According to Geoscope, Bhattacharya is only concerned with “two or more nearby wireless telecommunications systems.” *Id.* This misreads Bhattacharya, which expressly states that the description in paragraph [0054] is focused on “**alternative embodiments** of the present invention that use two or more systems to obtain signal-strength measurements.” APPLE-1005, [0054] (emphasis added). Reference to “alternative embodiments” in paragraph [0054] implicitly contemplates non-alternative embodiments that use, for example, a single system

to obtain signal-strength measurements. *See* APPLE-1055, ¶¶60.

Geoscope’s characterization of Zeng similarly overlooks the description that “[h]andoffs are broadly classified into two categories—hard and soft handoffs[,]” and “hard handoff can be further divided into two different types—**intra- and intercell handoffs**.” APPLE-1006, 1 (emphasis added). This contemplates different handoff scenarios, including those that occur within a single system (e.g., an “intracell” handoff, or a handover within one sector or between different sectors of the same cell). *See* APPLE-1055, ¶¶62-63.

Finally, Geoscope is wrong that Dr. Sundaresan’s deposition testimony supports its theory that wireless switching center 211 is “not requesting a handoff” and instead merely “requesting a measurement signal from the second system.” POR, 49. In other deposition testimony not cited in the POR, Dr. Sundaresan explained that Bhattacharya’s wireless switching center 211 uses “messages” (e.g., “protocol messages hand-off measurement request and hand-off measurement request 2” described in [0054] of Bhattacharya) and that “these messages **facilitate a hand-over process**.” *See* EX-2020, 72:11-73:10 (emphasis added); *see id.*, 74:10-19, 75:25-76:8. Thus, consistent with the Petition, Dr. Sundaresan’s testified in deposition that wireless switching center 211 may be configured to facilitate (e.g., initiate) a handoff process based on the protocol messages described in [0054] of Bhattacharya.

Geoscope's theories regarding a lack of reasonable expectation of success regarding Bhattacharya-Zeng also lack sufficient evidentiary support. The POR relies exclusively on the Sturza Declaration for its allegations regarding a lack of a reasonable expectation of success. But the Sturza Declaration largely repeats the same analysis as the POR and fails to cite any further support. *Compare* POR, 48-51 *and* EX-2018, ¶¶119-25. Further, as noted by Dr. Sundaresan, various statements in the Sturza Declaration represent overly broad characterizations of the relevant field of art. *See* APPLE-1055, ¶¶59-60. The Sturza Declaration also fails to identify specific implementation challenges of Bhattacharya-Zeng demanding a higher skill level. Nor does it advance any testimony that the type of handoff functionality involved in Bhattacharya-Zeng represented a point of novelty of the purported invention disclosed and claimed in the '104 patent. Simply put, Geoscope's theories against the combinability of Bhattacharya-Zeng—including the level of skill required for the combination and its purported complexities—are not supported by record evidence.

Finally, to the extent that Geoscope suggests Bhattacharya's disclosure of handoff functionality in at least paragraphs [0054] and [0095] represents non-enabling disclosure, the POR fails to advance any evidence regarding undue experimentation. *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988).

VI. CONCLUSION

For the foregoing reasons, Apple respectfully requests a final written decision finding the Challenged Claims unpatentable.

Respectfully submitted,

Date: 11-15-24

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CERTIFICATION UNDER 37 CFR § 42.24(d)

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Petitioner's Reply to Patent Owner's Response totals 5,586, which is less than the 5,600 allowed under 37 CFR § 42.24(b)(1).

Respectfully submitted,

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e)(4), the undersigned certifies that on November 15, 2024, a complete and entire copy of this Petitioner's Reply to Patent Owner's Response and all supporting exhibits were provided via email, to the Patent Owner by serving the email correspondence addresses of record as follows:

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