Apple Inc.
v.
Geoscope Technologies Pte. Ltd.

Patent Owner Demonstratives
IPR2024-00031 (Patent 8,400,358)
IPR2024-00032 (Patent 8,786,494)
IPR2024-00255 (Patent 7,561,104)
IPR2024-00259 (Patent 8,406,753)

February 7, 2025

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Geoscope Exhibit 2036
Apple v. Geoscope
IPR2024-00259

Overview

1. **Background**
2. Claim Construction
   - A. Calibration Data
   - B. [Non-Uniform] Grid Point
3. Spain and Bhattacharya Do Not Teach Or Suggest [Non-Uniform] Grid Points
   - A. Spain
   - B. IPR2024-00259: Bhattacharya and Yost
4. Level of Ordinary Skill

Claims At Issue

IPR	Patent	Claims At Issue[1]
IPR2024-00031[2]	8,400,358	16-20, 24, 26, 27
IPR2024-00032	8,786,494	2-5, 9, 11, 12, 14-16, 18-22, 27, 29, 31, 32
IPR2024-00255	7,561,104	2, 4, 6-10
IPR2024-00259	8,406,753	1, 7, 9, 32, 38, and 40

IPR2024-00031, -00032, -00255, 00259, POR, 1

1 Patent Owner has statutorily disclaimed claims 1, 3, and 11 of the ’104 Patent, claims 1, 15, 41, and 52 of the ’358 Patent, and claims 1, 25 and 35 of the ‘494 Patent.
2 Unless otherwise indicated herein, citations in these Demonstratives are to the IPR2024-00031 record.

IPR2024-00031 ('358 Patent)

Method To Modify Calibration Data Used To Locate A Mobile Unit

Ground	Claim(s)	Basis
1A	15, 16, 19, 20, 24, 27	§102: Bhattacharya
1B	15-20, 24, 26, 27	§103: Bhattacharya, Spain

IPR2024-00031 Petition, 1

IPR2024-00031 ('358 Patent)

Claim 18

18. The system of claim **15** wherein said database comprises previously-gathered calibration data for one or more non-uniform grid points within said region.

EX1001 ['358 Patent], Claim 18

IPR2024-00032 ('494 Patent)

Method To Modify Calibration Data Used To Locate A Mobile Unit

Ground	Claims	Basis
1A	1, 2, 5, 9, 12, 14, 16, 18-22	§102: Bhattacharya
1B	1-5, 9, 11, 12, 14-16, 18-22	§103: Bhattacharya, Spain
1C	25, 27, 29, 31, 32, 35	§103: Bhattacharya, Meunier
1D	25, 27, 29, 31, 32, 35	§103: Bhattacharya, Spain, Meunier

IPR2024-00032, Petition, 1

IPR2024-00032 ('494 Patent)

Claim 4

4. The method of claim **1** wherein said database comprises previously-gathered calibration data for one or more non-uniform grid points within said region.

EX1001 ['494 Patent], Claim 4

IPR2024-00255 ('104 Patent)

Method To Modify Calibration Data Used To Locate A Mobile Unit

Ground	Claims	Basis
1A	1, 3, 4, 6-11	§103: Bhattacharya, Zeng
1B	1-4, 6-11	§103: Bhattacharya, Zeng, Spain

IPR2024-00255, Petition, 1

IPR2024-00255 ('104 Patent)

Claim 2

2. The method of claim **1** wherein said database comprises previously-gathered calibration data for one or more non-uniform grid points within said region.

EX1001 ['104 Patent], Cl. 2

IPR2024-00259 ('753 Patent)

System and Method For Generating A Location Estimate Using Uniform and Non-Uniform Grid Point

Ground	Claim(s)	§103 Combination
1	1, 7, 9, 32, 38, and 40	§103: Bhattacharya and Yost

IPR2024-00259, Petition, 1

IPR2024-00259 ('753 Patent)

Claim 1

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

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

(b) generating one or more sets of grid points for said calibration data;

(c) receiving at least one network measurement report from a mobile device at an unknown location in said geographic region;

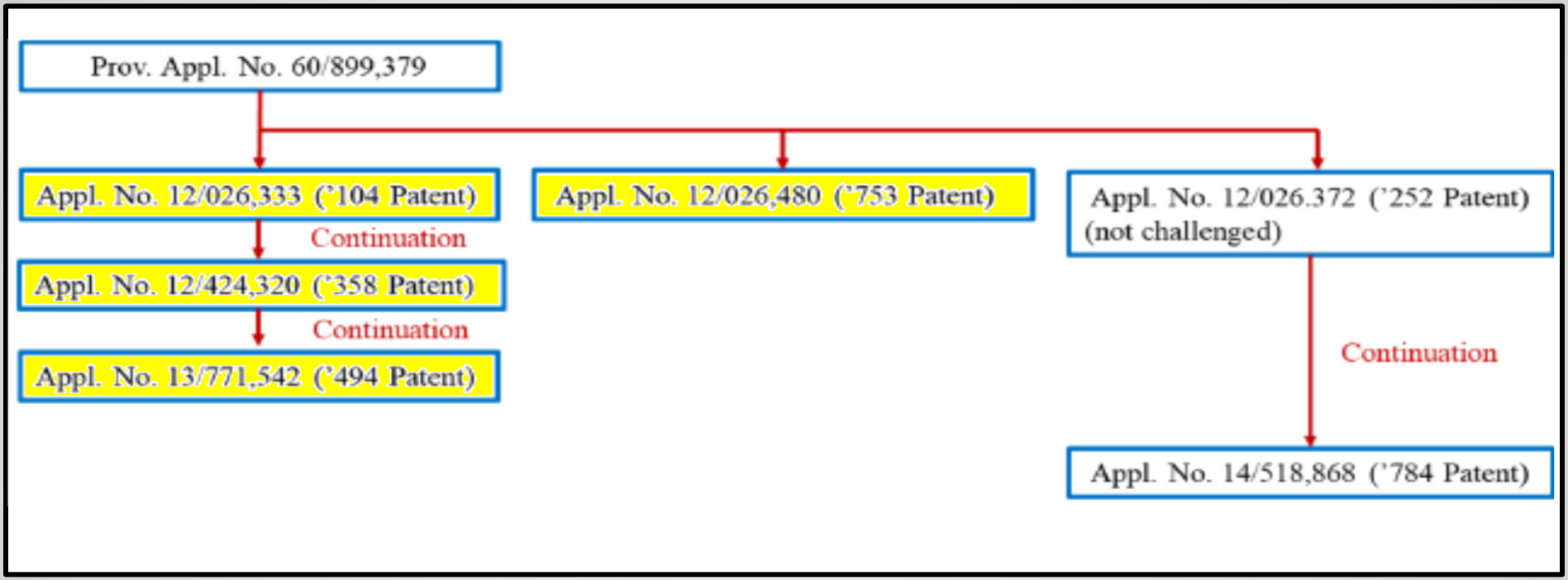
(d) evaluating said at least one network measurement report with each of said sets of grid points as a function of select ones of said characterizing parameters;

(e) selecting a set of grid points as a function of a predetermined criteria; and

(f) determining the location of a mobile device in said geographic region as a function of said selected set of grid points.

EX1001 ['753 Patent], Claim 1

Challenged Patents



POR, 8-9

Background of the Invention

While the above-described systems are useful in certain situations, there is a need to streamline the process in order to efficiently and effectively handle the vast amount of data being sent between the wireless communications network and the large number of mobile devices for which locations are to be determined. In this regard, the present subject matter overcomes the limitations of the prior art by estimating the location of a wireless mobile device using, at least in part, one or more pre-existing Network Measurement Reports ("NMRs") which include calibration data for a number of locations within a geographic region. The calibration data for these locations 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. Then, the received signal level measurements reported by the mobile device to be geolocated may be compared with the data associated with the various grid points to estimate the location of the mobile device. The performance of a grid-based pattern matching system such as that disclosed herein is typically dependent on stored received signal level measurements that accurately reflect the levels that are likely to be reported by the mobile device to be located. These grid points do not necessarily have to be part of a uniform grid and usually will not be uniformly distributed throughout the geographic region. These non-uniform grid points ("NUGs"), once determined, can be assigned geographic coordinates so that the NUGs may be used in determining the location of a mobile device exhibiting certain attributes as discussed in more detail below.

IPR2024-00259, EX1001 ['753 Patent], 2:21-50; POR, 10

Overview

1. Background
2. Claim Construction
   - **A. Calibration Data**
   - B. [Non-Uniform] Grid Point
3. Spain and Bhattacharya Do Not Teach Or Suggest [Non-Uniform] Grid Points
   - A. Spain
   - B. IPR2024-00259: Bhattacharya and Yost
4. Level of Ordinary Skill

Calibration Data

Claim Term	Court's Construction
"calibration data"	"modified or unmodified network measurement data associated with a geographic location"

IPR2024-00031, Pet, 2. *See also* POR, 24-25

Overview

1. Background
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   - A. Spain
   - B. IPR2024-00259: Bhattacharya and Yost
4. Level of Ordinary Skill

Claim Construction

[Non-Uniform] Grid Point	
Patent Owner Construction	**Petitioner Construction**
"a point associated with representative calibration data for an area whose boundaries are determined from evaluation of the calibration data."	"a point associated with representative calibration data for an area that are non-uniformly spaced throughout a geographic region."

IPR2024-00031, Pet., 3; POR, 25; Reply, 3-4

Claim Construction

[Non-Uniform] Grid Point

Final Construction
"a point associated with representative calibration data for an area"

Defendants' use of "representative calibration data" is intended to reflect that the defining characteristic of a NUG region—as explained in the specifications of the '753 Patent, '104 Patent, and '748 Patent—is that the data points within an area are all "statistically very similar" such that each of the grid points within the NUG region can represent the overall NUG.

IPR2024-00031, Pet., 3; EX2012 [Markman Order], 18-20; POR, 26-27

Claim Construction

[Non-Uniform] Grid Point

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

EX2012 [Markman Order], 19 (quoting EX2016 ['753 Patent], Abstract

But the italicized language from which Plaintiff's construction is drawn is directed more toward what *must be done* to arrive at a grid point or set of grid points rather than what a grid point *is*.

EX2012 [Markman Order], 19; POR, 27-28

Claim Construction

[Non-Uniform] Grid Point

18. The system of claim **15** wherein said database comprises previously-gathered calibration data for one or more non-uniform grid points within said region.

EX1001 ['358 Patent], cl. 18, POR, 32-33

In general, a non-uniform grid point (NUG) may represent the signal characteristics and/or calibration data over a given region. As illustrated in FIG. **1**, a set of NUGs (NUG**1**, NUG**2** and NUG**3**) are shown as being a part of a larger geographical region (R), which includes various wireless networking components (e.g., (MS **11** and BS **20**—NUG**1**), (MSs **12-15**—NUG**2**) and (MSs **16-18** and BS **30**—NUG**3**)). The NUGs represent an area of collected calibration data, which may be stored in a database for easy retrieval during a calibration data comparison operation between the NUG and a received network measurement report (NMR).

EX1001 ['358 Patent], 3:57-67; POR, 33

Claim Construction

[Non-Uniform] Grid Point

The technique is repeated until all calibration grid points in the region R are exhausted. At the end of this process one has divided the region into a collection of NUGs, where multiple co-located NUGs can exist. The NUGs fully cover the region R and each NUG has statistically similar data accumulated into itself. The 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.

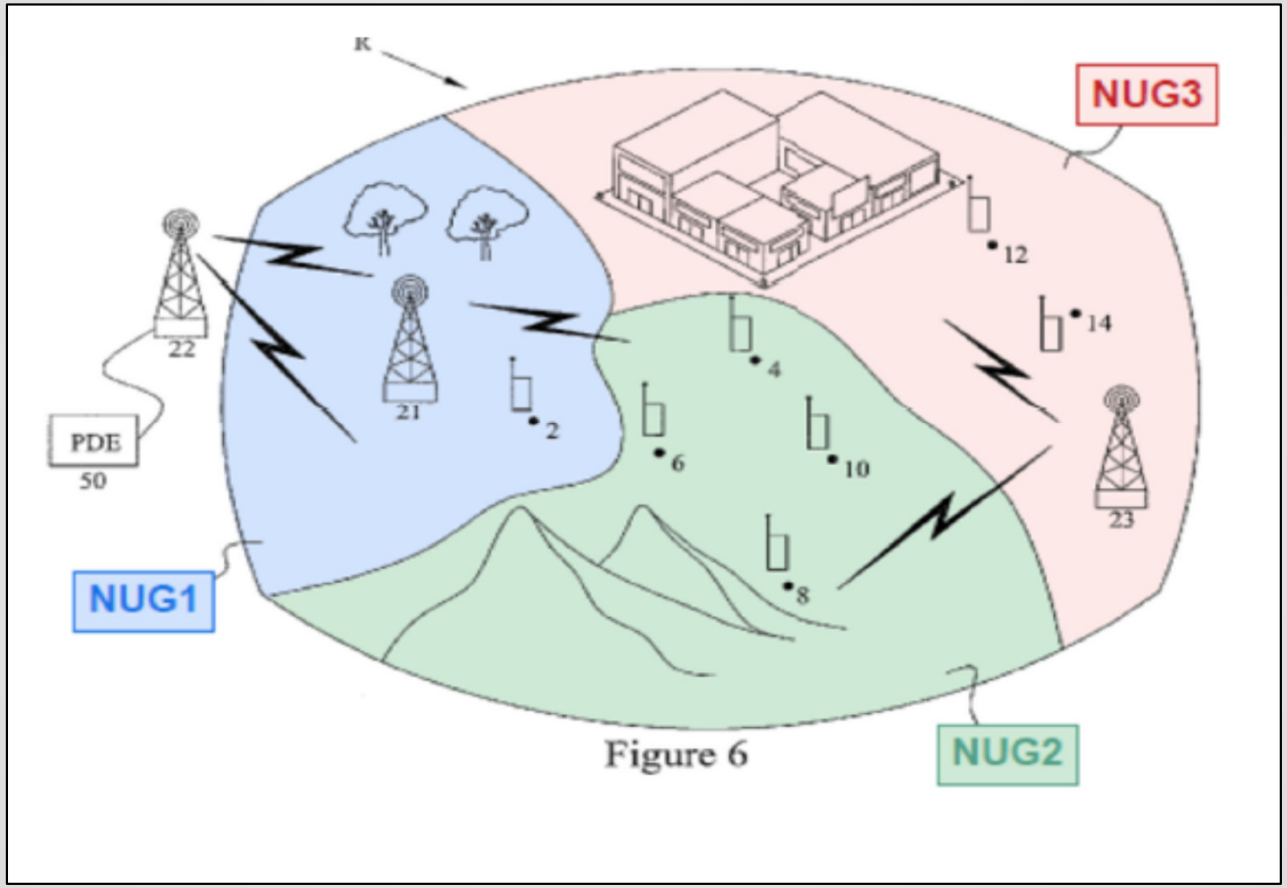
EX2030 ['379 Provisional], 7, POR, 33

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

EX2016 ['753 Patent], 12:7-14; POR, 33

Claim Construction

[Non-Uniform] Grid Point



EX2017 ['784 Patent], Fig. 6 (annotated), POR, 34

Claim Construction

[Non-Uniform] Grid Point

In any of these cases, the NUG generator evaluates the data vectors at a particular calibration point, or at the fixed grid point it is assigned. This calibration point or grid point serves as the root of the first NUG. The root of the NUG is the calibration data vector that initiates the creation of that NUG. The evaluation of the data vectors is of great importance since it is fundamental to the method. The vectors are examined using increasingly stringent tests of statistical sufficiency. In particular, we search for whether the data vectors exhibit clustering. If the data exhibits tight clustering, the data for the next candidate calibration point is aggregated to the former and the clustering property is re-evaluated. If the second also has a cluster but this cluster is sufficiently different, we deem that the data for the two considered calibration points should be allocated to the roots of separate NUGs. If the aggregate cluster is statistically very similar to either of the

EX2030 ['379 Provisional], 6; POR, 36-37

Claim Construction

’753 Patent: Grid Point

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

IPR2024-00259, EX1001 [’753 Patent], cl. 1; Reply, 13

(b) generating one or more sets of grid points for said calibration data;

IPR2024-00259, EX1001 [’753 Patent], cl. 1; Reply, 13

assigned to grid points located in a geographic region. The grid points may be non-uniformly spaced throughout the geographic region and hence may be referred to as non-uniform grid points (“NUGs”). The location of a wireless

IPR2024-00259, EX1001 [’753 Patent], 9:40-43; Reply, 12

Overview

1. Background
2. Claim Construction
   A. Calibration Data
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3. **Spain and Bhattacharya Do Not Teach Or Suggest [Non-Uniform] Grid Points**
   A. Spain
   B. IPR2024-00259: Bhattacharya and Yost
4. Level of Ordinary Skill

Overview

1. Background
2. Claim Construction
   - A. Calibration Data
   - B. [Non-Uniform] Grid Point
3. Spain and Bhattacharya Do Not Teach Or Suggest [Non-Uniform] Grid Points
   - **A. Spain**
   - B. IPR2024-00259: Bhattacharya and Yost
4. Level of Ordinary Skill

Spain Does Not Teach Or Suggest NUGs

[0086] In accordance with the illustrative embodiment, the boundaries of each location are based, at least in part, on:

[0087] i. natural and man-made physical attributes of geographic region **220** (e.g., buildings, sidewalks, roads, tunnels, bridges, hills, walls, water, cliffs, rivers, etc.),

[0088] ii. legal laws governing geographic region **220** (e.g., laws that pertain to the location and movement of people and vehicles, etc.),

[0089] iii. theoretical predictions and empirical data regarding the location and movement of individuals and groups of people and vehicles in geographic region **220**,

[0090] iv. the desired accuracy of the estimates made by location server **214**, and

[0091] v. patterns of the location and movement of people and vehicles within geographic region **220**,

[0092] vi. the calendrical time T, and

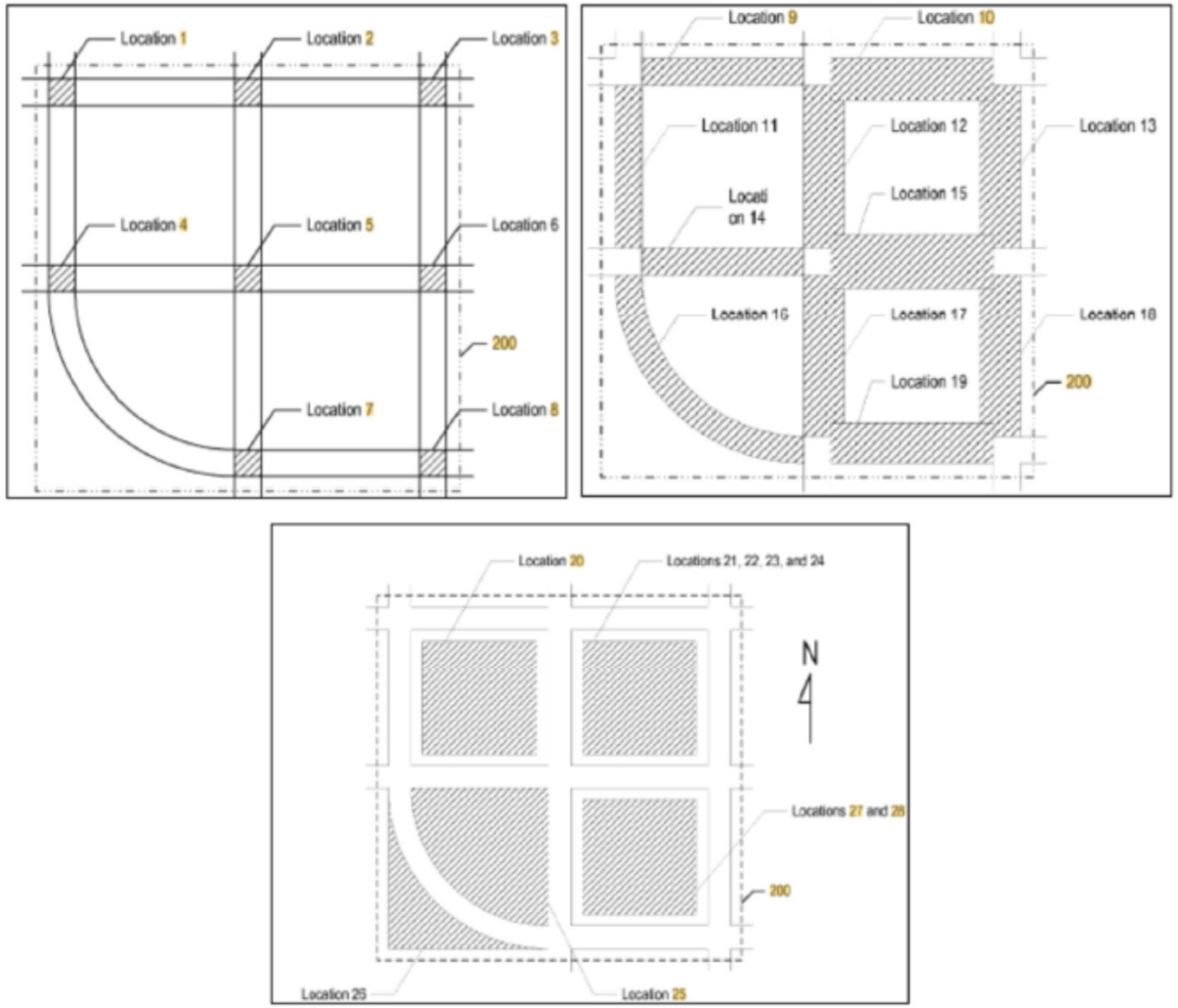
[0093] vii. the environmental conditions N,

IPR2024-00031, EX1006 [Spain], [0086]-[0093]; Pet., 64-66, POR, 59-60; Sur-Reply, 24

Spain Does Not Teach Or Suggest NUGs

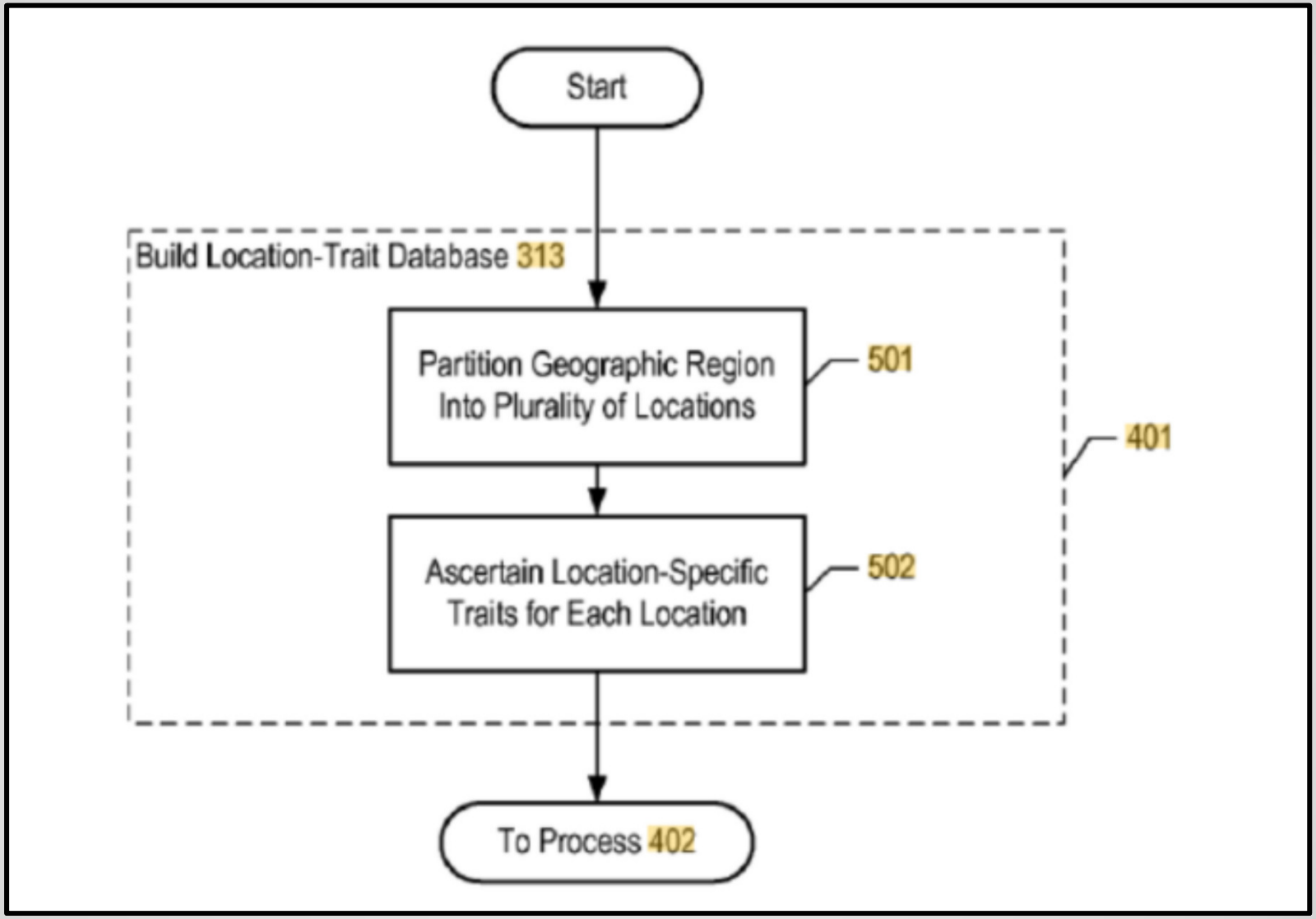
IPR2024-00031, EX1006 [Spain], Fig. 6; Pet., 63-66, POR, 61-63

Spain Does Not Teach Or Suggest NUGs



IPR2024-00031, EX1006 [Spain], Fig. 6C-E; Pet., 63-66, POR, 59-60; Sur-Reply, 24

Spain Does Not Teach Or Suggest NUGs



IPR2024-00031, EX1006 [Spain], Fig. 5; POR, 63-65

Overview

1. Background
2. Claim Construction
   - A. Calibration Data
   - B. [Non-Uniform] Grid Point
3. The Alleged Prior Art Does Not Teach Or Suggest [Non-Uniform] Grid Points
   - A. Spain
   - **B. IPR2024-00259: Bhattacharya and Yost**
4. Level of Ordinary Skill

Bhattacharya Does Not Teach The Challenged Limitation

’753 Patent, Claim 1
(b) generating one or more sets of grid points for said calibration data;

IPR 2024-00259, EX1001 [‘753 Patent], cl. 1; POR, 38-40, Sur-Reply, 2-5

Bhattacharya
[0106] At subtask **501**, a rectangular grid of X by Y tessellated squares is overlaid onto geographic region **200** (see **FIG. 6**) and the center of each square represents a location.

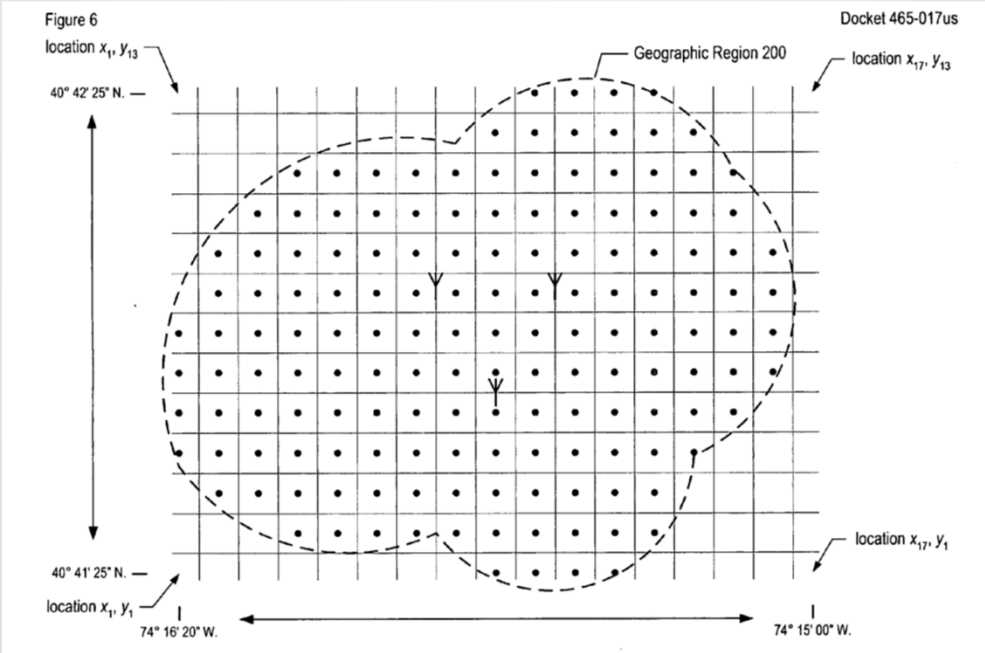
IPR2024-00259, EX1004 [Bhattacharya], [0106], Pet., 35

Bhattacharya Does Not Teach Grid Points

Bhattacharya

[0106] At subtask **501**, a rectangular grid of X by Y tessellated squares is overlaid onto geographic region **200** (see **FIG. 6**) and the center of each square represents a location.

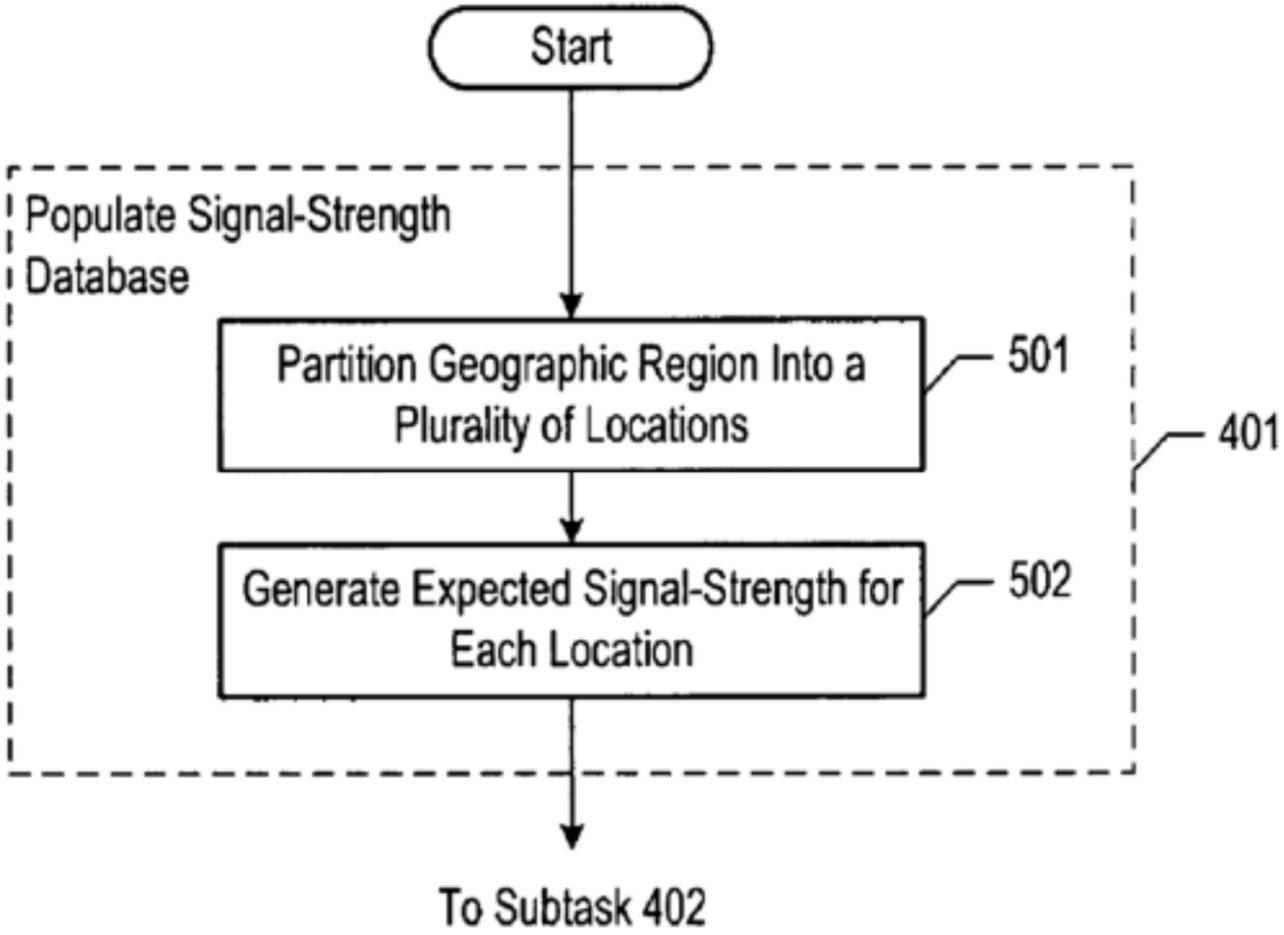
IPR2024-00259, EX1004 [Bhattacharya], [0106], Pet., 35



IPR2024-00259, EX1004 [Bhattacharya], Fig. 6, Pet., 35-36, POR, 41

Bhattacharya Does Not Teach Grid Points

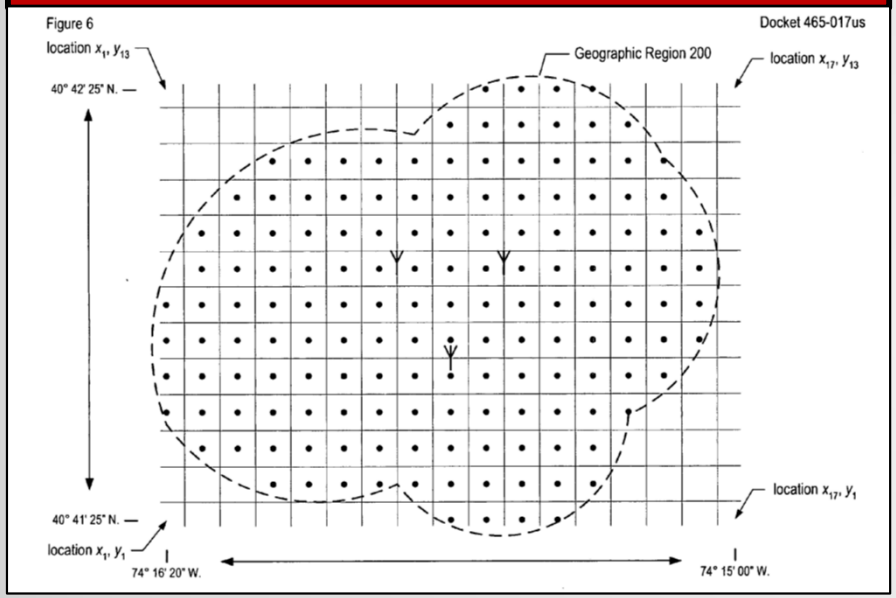
Bhattacharya



IPR2024-00259, EX1004 [Bhattacharya], Fig. 5; POR, 43

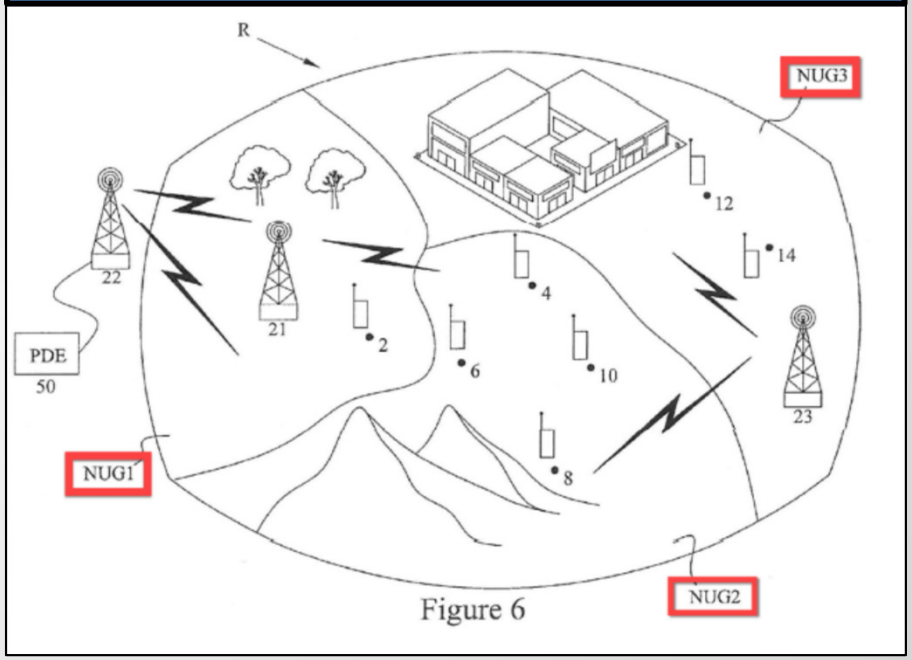
Bhattacharya Does Not Teach Grid Points

Bhattacharya



IPR2024-00259, EX1004 [Bhattacharya], Fig. 6

'784 Patent



IPR2024-00259, EX2017 ['784 Patent], Fig. 6

IPR 2024-00259, POR, 44-45

Yost Does Not Teach Or Suggest Grid Points

Yost

The calibration signal strengths measure an average over small areas of a pre-determined size. With these averages, a standard set of signal strengths for the coverage area can be determined, with some of the effects of fast fading removed. In addition, the fluctuations observed for each BTS (serving and neighboring) about the average can be recorded and used to determine tolerances in the processing that follows.

IPR2024-00259, EX1008 [Yost], Fig. 6; Pet., 37-38; POR, 45-46

Overview

1. Background
2. Claim Construction
   - A. Calibration Data
   - B. [Non-Uniform] Grid Point
3. Spain and Bhattacharya Do Not Teach Or Suggest [Non-Uniform] Grid Points
   - A. Spain
   - B. IPR2024-00259: Bhattacharya and Yost
4. **Level of Ordinary Skill**

Level Of Ordinary Skill

The -00031, -00032 and -0255 Petitions Do Not Identify A Level Of Ordinary Skill

Incorporation by reference; combined documents. Arguments must not be incorporated by reference from one document into another document. Combined motions, oppositions, replies, or other combined documents are not permitted.

37 C.F.R. §42.6(a)(3); IPR2024-00031, POR, 41

"parties that incorporate expert testimony by reference in their petitions, motions, or replies without providing explanation of such testimony risk having the testimony not considered by the Board."

PTAB Trial Practice Guide, 35-36; IPR2024-00031, POR, 41

Level Of Ordinary Skill

Petitioner's Level Of Ordinary Skill Is Deficient

8. I have been informed that a person of ordinary skill in the art ("POSITA") had at least a Bachelor's degree in electrical engineering, computer science, or a similar discipline, and at least two years of experience in the field working with working with navigation and/or geolocation systems. Superior education could compensate for a deficiency in work experience, and *vice-versa*. Based on my experiences, I have a good understanding of the capabilities of a POSITA. Indeed, I have taught, mentored, advised, and collaborated closely with many such individuals over the course of my career.

IPR2024-00031, Ex. 1003 [Sundaresan Decl.], ¶8; POR, 44-51

Level Of Ordinary Skill

Dr. Sundaresan's Declaration Is Entitled To No Weight

Expert testimony must be "based on sufficient facts and data." Fed. R. Evid. 702(b)

Expert testimony must be "the product of reliable principles and methods." Fed. R. Evid. 702(c)

The "expert's opinion [must reflect] a reliable application of the principles and methods to the facts of the case." Fed. R. Evid. 702(d)

"Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight." 37 C.F.R. § 42.65(a)

IPR2024-00031, POR, 51-52

Level Of Ordinary Skill

Dr. Sundaresan's Declaration Is Entitled To No Weight

"The inquiry into how a person of ordinary skill in the art understands a claim term provides an objective baseline from which to begin claim interpretation." *Phillips v. AWH Corp.*, 415 F.3d at 1313

"[T]he person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." *Phillips v. AWH Corp.*, 415 F.3d at 1313

IPR2024-00031, POR, 57

Level Of Ordinary Skill

Dr. Sundaresan's Declaration Is Entitled To No Weight

IV. LEVEL OF ORDINARY SKILL IN THE ART

8. I have been informed that a person of ordinary skill in the art ("POSITA") had at least a Bachelor's degree in electrical engineering, computer science, or a similar discipline, and at least two years of experience in the field working with working with navigation and/or geolocation systems. Superior education could compensate for a deficiency in work experience, and *vice-versa*. Based on my experiences, I have a good understanding of the capabilities of a POSITA. Indeed, I have taught, mentored, advised, and collaborated closely with many such individuals over the course of my career.

IPR2024-00031, POR, 43

Level Of Ordinary Skill

Dr. Sundaresan's Opinions On Claim Construction Are Unsupported

"Q Are you applying the district court's constructions in your analysis? A Yes." EX2021 [Sundaresan Dep. Tr.], 35:8-10

"Q Do you agree with the district court's constructions? A Yes. I do." EX2021 [Sundaresan Dep. Tr.], 36:8-10

"So I've gone over [the claim construction order] but I haven't analyzed it deeply, so my main focus was on what the final construction was that the district court stipulated. And so that was my key takeaway from this district court order." EX2021 [Sundaresan Dep. Tr.], 38:12-1.

IPR2024-00031, POR, 53-54

Level Of Ordinary Skill

Dr. Sundaresan's Opinions On Claim Construction Are Unsupported

"Q And for [the district court's analysis of grid point], it's fair to say that you've reviewed the section but you don't have an opinion about whether the court's rationale is correct? … A Yeah. I'm not opining either way because I haven't analyzed [the court's rationale] deeply…" EX2021 [Sundaresan Dep. Tr.], 35:8-10

"A [The district court's statement is] quite broad and vague and it's hard to opine one way or the other." EX2021 [Sundaresan Dep. Tr.], 52:24-25

"A [Statistically very similar as used in the district court's analysis] is a quite indefinite and vague term that I don't understand what it means." EX2021 [Sundaresan Dep. Tr.], 53:11-13

IPR2024-00031, POR, 54-55

Level Of Ordinary Skill

Dr. Sundaresan Did Not Consider The Entire Intrinsic Record

"I'm not seeing [the '379 Provisional] as part of my declaration, so I would assume that it wasn't part of the analysis then." EX2021 [Sundaresan Dep. Tr.], 60:6-8

"I might not have done a deep dive" reviewing the prosecution history. EX2021 [Sundaresan Dep. Tr.], 60:24-61:2

"I don't recall considering or incorporating [the '784 Patent] in my analysis." EX2021 [Sundaresan Dep. Tr.], 65:5-7

"I don't recall including [the '753 Patent] in the analysis." EX2021 [Sundaresan Dep. Tr.], 65:14-15

IPR2024-00031, POR, 56

Level Of Ordinary Skill

-0255 IPR: Petitioner Misinterprets Bhattacharya and Zeng

[0054] The illustrative embodiment comprises one wireless switching system, but after reading this disclosure it will be clear to those skilled in the art how to make and use alternative embodiments of the present invention that use two or more systems to obtain signal-strength measurements. Typically, this is useful when a wireless terminal is near the boundary of one or more systems. When two or more systems are used to obtain signal-strength measurements, one wireless switching center can use the IS-41 protocol messages HandoffMeasurementRequest and HandoffMeasurementRequest2 to elicit signal-strength measurements from another.

IPR2024-00255, POR, 48-51; EX1005 [Bhattacharya], [0054]

Level Of Ordinary Skill

-0255 IPR: Petitioner Misinterprets Bhattacharya and Zeng

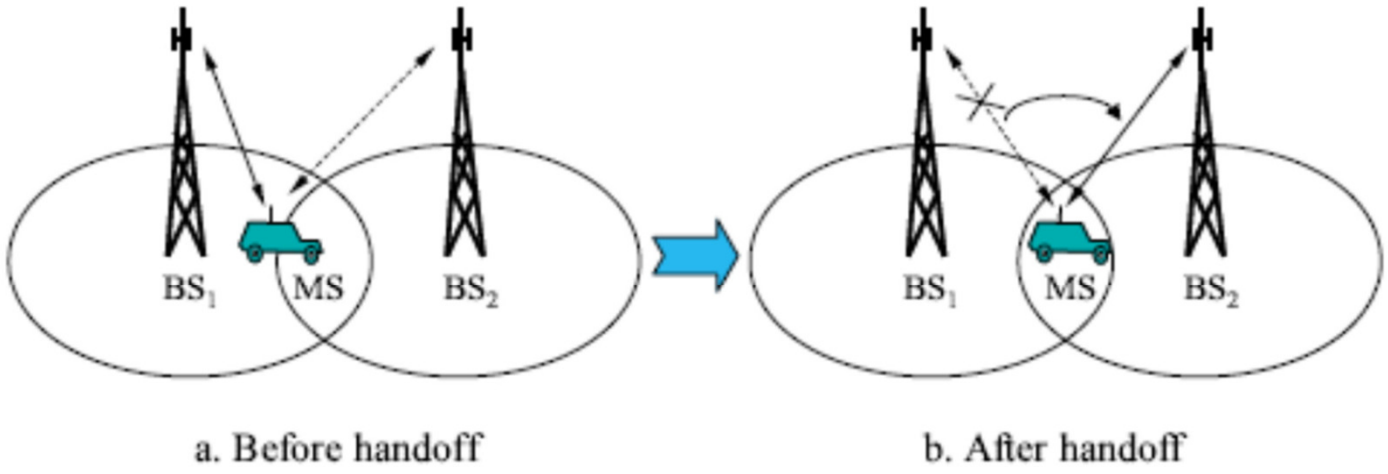


Figure 1.1 Hard handoff between the MS and BSs.

IPR2024-00255, POR, 48-51; EX1006 [Zeng], Fig. 11