

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BMW OF NORTH AMERICA, LLC,

Petitioner,

v.

NORTHSTAR SYSTEMS, LLC,

Patent Owner.

Case No. IPR2023-01049

U.S. Patent No. 8,805,416

PETITION FOR *INTER PARTES* REVIEW

TABLE OF CONTENTS

I.	Relief Requested.....	1
II.	The '416 Patent.....	1
A.	Overview	1
B.	The '416 Patent Is Not Entitled to Priority Earlier than September 25, 2001	2
III.	Claim Construction.....	3
IV.	Level of Ordinary Skill.....	3
V.	Ground 1: Claims 1, 3-5, and 9-13 Are Obvious over Chern and Garceran.....	4
A.	Overview of the Prior Art.....	4
1.	Chern	4
2.	Garceran	4
B.	Claims.....	6
1.	Independent claim 1	6
a.	[1preamble]: “A method, comprising:”	6
b.	[1a]: “receiving, by a mobile communication device, information about a current location of the mobile communication device, wherein the information about the current location includes global positioning system (GPS) information;”	6
c.	[1b]-[1c]: “detecting, by the mobile communication device, signal interference; generating, by the mobile communication device, an indication of the signal interference;”	7
i.	Motivation to Combine Garceran’s Detection of Signal Interference with Chern’s System.....	9

ii.	Expectation of Success.....	11
d.	[1d]: “communicating, by the mobile communication device, with a remote source over a wireless network, wherein said communicating comprises sending both the indication of the signal interference and the GPS information from the mobile communication device to the remote source;”	12
e.	[1e]: “receiving, by the mobile communication device, navigation information from the remote source in response to sending both the indication of the signal interference and the GPS information, wherein the navigation information comprises data for plotting a course on a map including the current location of the mobile communication device;”	13
f.	[1f]: “and displaying, by the mobile communication device, the map based on the navigation information.”	15
2.	Claim 3: “The method of claim 1, wherein the navigation information comprises additional information about an area around the current location.”	15
3.	Claim 4: “The method of claim 1, wherein the navigation information comprises first mapping information associated with a first time centered around a first local position, and wherein the method comprises receiving, by the mobile communication device, additional navigation information comprising second mapping information associated with a second time centered around a second location different than the first local position.”	16
4.	Claim 5: “The method of claim 4, wherein the first mapping information is associated with a first direction of travel from the second local position to the first local position, and wherein the second mapping information is	

	associated with a second direction of travel from the first local position to the second local position.”	17
5.	Claim 9: “The method of claim 1, wherein the signal in[ter]ference is indicative of a noise signature associated with the current location.”	18
6.	Claim 10: “The method of claim 1, wherein the signal interference is indicative of a signal power of one or more signals received by the mobile communication device.”	19
7.	Independent Claim 11	20
a.	[11preamble]: “A method, comprising:”	20
b.	[11a]: “receiving, by a server, position information from a mobile communication device,”	20
c.	[11b]: “wherein the position information includes global positioning system (GPS) information and additional information about a local position of the mobile communication device other than the GPS information, wherein the additional information comprises an indication of signal interference detected at the mobile communication device;”	20
i.	Motivation to Combine Garceran’s Detection of Signal Interference with Chern’s System.....	22
ii.	Expectation of Success.....	22
d.	[11c]-[11d]: “determining, by the server, navigation information associated with the local position based on both the GPS information and the indication of signal interference, wherein the navigation information comprises data for plotting a course on a map including the local position of the mobile communication device”	23

e.	[11e]: “and transmitting, by the server, the navigation information to the mobile communication device.”	23
8.	Claim 12: “The method of claim 11, further comprising: receiving, by the server, new position information indicating a new position of the mobile communication device; and transmitting, by the server, new navigation information associated with the new position to the mobile communication device responsive to receiving the new position information.”	24
9.	Claim 13: “The method of claim 12, wherein transmitting the navigation information comprises transmitting first mapping information at a first time associated with the local position, and wherein transmitting the new navigation information comprises transmitting second mapping information at a second time associated with the new position.”	25
VI.	Ground 2: Claim 6 is Obvious Over Chern, Garceran, and Ihara.	25
A.	Ihara.....	25
B.	Claims.....	26
1.	Claim 6: “The method of claim 1, wherein at least a portion of the GPS information is communicated in XML format and comprises one or more different XML tags that indicate a type of the additional information being communicated by the mobile communication device.”	26
VII.	Ground 3: Claims 17-19 Are Obvious Over Yamakita.....	28
A.	Yamakita	28
B.	Claims.....	30
1.	Independent Claim 17	30
a.	[17preamble]: “A method comprising:”	30

b.	[17a]: “acquiring, by a communication device, a plurality of items of information representing a current location of the communication device, wherein the plurality of items of information comprises global positioning system (GPS) information and environmental information associated with the current location,”	30
c.	[17b]: “and wherein the environmental information is acquired by one or more sensory input devices of the communication device;”	31
d.	[17c]: “communicating, by the communication device, the plurality of items of information, including the GPS information and the environmental information associated with the current location, to a remote server;”	32
e.	[17d]: “receiving, by the communication device, current position information in response to communicating the plurality of items of information, wherein the current position information comprises data for plotting a course on a map including the current location of the communication device;”	34
f.	[17e]: “and displaying, by the communication device, the map based on the current position information.”	39
2.	Claim 18: “The method of claim 17, wherein the communication device comprises a camera and wherein the environmental information comprises image data captured by the camera.”	40
3.	Claim 19: “The method of claim 17, wherein the communication device comprises a microphone and wherein the environmental information comprises sound data captured by the microphone.”	40
VIII.	Ground 4: Claims 17-19 Are Obvious Over Yamakita and Chern.	41

A.	Claims.....	41
1.	Independent Claim 17	41
a.	[17preamble]: “A method comprising:”	41
b.	[17a]: “acquiring, by a communication device, a plurality of items of information representing a current location of the communication device, wherein the plurality of items of information comprises global positioning system (GPS) information and environmental information associated with the current location,”	41
c.	[17b]: “and wherein the environmental information is acquired by one or more sensory input devices of the communication device;”	42
d.	[17c]: “communicating, by the communication device, the plurality of items of information, including the GPS information and the environmental information associated with the current location, to a remote server;”	43
e.	[17d]: “receiving, by the communication device, current position information in response to communicating the plurality of items of information, wherein the current position information comprises data for plotting a course on a map including the current location of the communication device;”	45
f.	[17e]: “and displaying, by the communication device, the map based on the current position information.”	50
2.	Claim 18: “The method of claim 17, wherein the communication device comprises a camera and wherein the environmental information comprises image data captured by the camera.”	53

3.	Claim 19: “The method of claim 17, wherein the communication device comprises a microphone and wherein the environmental information comprises sound data captured by the microphone.”	53
IX.	Discretionary Denial Is Not Warranted	54
A.	Discretionary Denial is Not Warranted under § 325(d).....	54
B.	Discretionary Denial Is Not Warranted Under <i>Fintiv</i>	54
X.	Mandatory Notices.....	56
A.	Real Parties-in-Interest Under 37 C.F.R. § 42.8(b)(1).....	56
B.	Related Matters Under 37 C.F.R. § 42.8(b)(2)	56
C.	Lead and Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3)	58
D.	Service Information Under 37 C.F.R. § 42.8(b)(4).....	58
XI.	Standing	59
XII.	Conclusion	59

TABLE OF AUTHORITIES

Page(s)

Federal Cases

<i>Apple Inc. v. Fintiv, Inc.</i> , IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020)	54, 55
<i>BMW of North America LLC v. NorthStar Systems LLC</i> , No. 6:23-cv-00456 (W.D. Tex), and BMW AG	54, 56
<i>CommScope Techs. LLC v. Dali Wireless, Inc.</i> , IPR2022-01242, Paper 23 (PTAB Feb. 27, 2023)	56
<i>NetNut Ltd. v. Bright Data Ltd.</i> , IPR2021-01492, Paper 12 (PTAB Mar. 21, 2022)	55
<i>NorthStar Systems LLC v. Bayerische Motoren Werke AG</i> , No. 2: 22-cv-00496 (E.D. Tex)	54, 56
<i>PowerOasis, Inc. v. T-Mobile USA, Inc.</i> , 522 F.3d 1299 (Fed. Cir. 2008)	2
<i>Protect Animals with Satellites v. OnPoint Sys., LLC</i> , IPR2021-01483, Paper 11 (PTAB Mar. 4, 2022)	6, 26, 29, 55
<i>Realtime Data, LLC v. Iancu</i> , 912 F.3d 1368 (Fed. Cir. 2019)	3

Federal Statutes

35 U.S.C. § 102(e)	4, 25, 28
35 U.S.C. § 325(d)	54

Regulations

37 C.F.R. § 42.8(b)(1)	56
37 C.F.R. § 42.8(b)(2)	56
37 C.F.R. § 42.8(b)(3)	58

37 C.F.R. § 42.8(b)(4).....	58
37 C.F.R. § 42.24(a).....	60

LIST OF EXHIBITS

Exhibit	Description
Ex. 1001	U.S. Patent No. 8,805,416 (“the ’416 patent”)
Ex. 1002	File History of U.S. Patent No. 8,805,416
Ex. 1003	Declaration of Samuel P. Pullen, PhD (Decl.)
Ex. 1004	Curriculum Vitae of Samuel P. Pullen
Ex. 1005	U.S. Patent No. 6,195,022 to Yamakita (“Yamakita”)
Ex. 1006	U.S. Patent No. 6,336,073 to Ihara et al. (“Ihara”)
Ex. 1007	RESERVED
Ex. 1008	U.S. Patent Application Publication No. 2003/0060211 to Chern et al. (“Chern”)
Ex. 1009	U.S. Patent No. 7,822,635 to Brown et al. (“Brown”)
Ex. 1010	U.S. Patent No. 6,226,589 to Maeda et al. (“Maeda”)
Ex. 1011	WIPO Publication No. WO2000/22593 to Drury et al. (“Drury”)
Ex. 1012	WIPO Publication No. WO2000/03364 to Obradovich et al. (“Obradovich”)
Ex. 1013	U.S. Patent No. 5,867,110 to Naito et al. (“Naito”)
Ex. 1014	File History of U.S. Patent Application No. 09/690,001 (’001 application)
Ex. 1015	Comparison of the ’416 patent and the ’001 application
Ex. 1016	File History of U.S. Patent Application No. 09/682,600
Ex. 1017	U.S. Patent No. 6,522,888 to Garceran et al. (“Garceran”)
Ex. 1018	RESERVED

Exhibit	Description
Ex. 1019	Ian D. Kitching, “GPS and Cellular Radio Measurement Integration,” <i>Journal of Navigation</i> , Vol. 53, No. 3, September 2000, pp. 451-463. (Available at https://www.cambridge.org/core/journals/journal-of-navigation/article/abs/gps-and-cellular-radio-measurement-integration/C563A3AE053461124A4127E6B9B2DD13). (“Kitching”)
Ex. 1020	Goran M. Djuknic and Robert E. Richton, “Geolocation and Assisted GPS,” <i>Computer (IEEE)</i> , Vol. 34, No. 2, February 2001, pp. 123-125. (Available at https://doi.org/10.1109/2.901174). (“Djuknic”)
Ex. 1021	Complaint in <i>NorthStar Systems LLC v. Bayerische Motoren Werke AG</i> , 2:22-cv-00496 (EDTX).
Ex. 1022	Infringement contentions in <i>NorthStar Systems LLC v. Bayerische Motoren Werke AG</i> , 2:22-cv-00496 (EDTX).

I. Relief Requested

BMW of North America, LLC (Petitioner) requests *inter partes* review of claims 1, 3-6, 9-13, and 17-19 of U.S. Patent No. 8,805,416 (“the ’416 patent”) based on the following grounds:

Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)
1	1, 3-5 and 9-13	103	Chern and Garceran
2	6	103	Chern, Garceran, and Ihara
3	17-19	103	Yamakita
4	17-19	103	Yamakita and Chern

II. The ’416 Patent

A. Overview

The ’416 patent generally relates to location-based services, including “navigation assistance” systems and methods that use “positioning” information to inform the navigation. Ex. 1001, 4:35-51, 4:62-64, 5:4-5, 5:63-6:15.

The positioning information includes information “obtained from GPS satellites,” “a Bluetooth transponder,” “information about the different base stations or receivers/transmitters which are communicating with the client” and/or other “environmental information.” Ex. 1001, 4:35-51, 4:62-64, 5:4-5, 5:63-6:15.

A “thin client”—such as a “cell phone”—detects and transmits the positioning information to a base station and server, which uses the information to provide the thin client with navigation information. Ex. 1001, 1:26-35, 4:32-42, 4:59-64, 5:60-62, 6:1-3, 6:11-15, 7:21-29.

B. The '416 Patent Is Not Entitled to Priority Earlier than September 25, 2001

The '416 patent, filed February 14, 2008, is a divisional of U.S. application Ser. No. 09/682,600 filed September 25, 2001, which is a continuation-in-part (CIP) of U.S. application Ser. No. 09/690,001, filed October 16, 2000. The '416 patent is not entitled to a priority date earlier than September 25, 2001.

There is no presumption that the '416 patent is entitled to the effective filing date of the '001 application because it is a CIP. *PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1305 (Fed. Cir. 2008). While Patent Owner bears the burden of proving priority, (*id.*), Petitioner nonetheless submits that the '416 patent claims are not entitled to priority to the '001 application because that application neither disclosed nor claimed, *inter alia*:

- detecting, sending, or receiving signal interference/an indication of interference, as recited in independent claims 1 and 11; or
- detecting, sending, or receiving environmental information, as recited in independent claim 17; or

- receiving, generating, or transmitting mapping/navigation information associated with, based on, or in response to, the signal interference/indication of signal interference, or environmental information. *See generally* Ex. 1001; Ex. 1014, 230-45; Ex. 1015.

Any possible support for these limitations was first added to the specification of the CIP application Ser. No. 09/682,600 filed September 25, 2001. Ex. 1015; Decl. ¶¶ 47-52. Thus, the earliest possible priority is to September 25, 2001.

III. Claim Construction

No claim terms need to be construed to resolve unpatentability. *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019).

IV. Level of Ordinary Skill

A person of ordinary skill in the art (“POSITA”) at the time of the purported invention would have had at least a bachelor’s degree in Computer or Electrical Engineering or an equivalent engineering discipline, and approximately three years of experience in navigation or geolocation systems alongside a background in telecommunications. Additional education could substitute for professional experience, and significant work experience could substitute for formal education. Decl. ¶ 58.

V. Ground 1: Claims 1, 3-5, and 9-13 Are Obvious over Chern and Garceran.

A. Overview of the Prior Art

1. Chern

Chern, filed August 27, 1999, is prior art under at least 35 U.S.C. § 102(e). Chern discloses a wireless location-based information retrieval system having navigation applications. Chern, Abstract, [0044]. The system includes a wireless handset having an incorporated “position determination system” for determining the handset’s location using GPS or “[a]lternative position determination systems.” Chern, [0040]. The system also includes a server which communicates with the handset over a wireless network. Chern, [0043]. The system provides “driving directions to a destination address ... to a handset user.” Chern, [0044].

Chern further discloses detecting additional information that would improve the accuracy of its position determination system, including detecting handset “height, speed of travel, and any other useful location or position parameters” and sending both the GPS and additional information to a server via a wireless network comprised of base stations. Chern, [0040], [0043]-[0044].

2. Garceran

Garceran, filed August 31, 1999, is prior art under at least 35 U.S.C. § 102(e). Garceran teaches “a wireless communications system” that “determines

and/or receives location information for the wireless unit along with other information associated with the location information.” Garceran, 2:12-15

Like Chern, and as illustrated in Figure 4, “wireless unit 70 includes GPS receiver circuitry 72 which receives GPS signals from a duplexer 74 which is connected to the antenna 76 of the wireless unit 70.” Garceran, 6:31-44. “[T]he GPS receiver circuitry 72 provides a location information which can include time, speed, distance and/or direction for the wireless unit to the processing circuitry 78 of the wireless unit 70.” Garceran, 6:39-44. And like Chern, Garceran’s communication device is configured to communicate the GPS information with one or more base stations of a wireless network. Garceran, 6:59-62.

Because “[a] change in operating condition could trigger a dynamic change in the RF coverage provided by the serving base station(s) and/or neighboring base stations to the wireless unit(s) in the location or range of location[,]” the wireless unit also “determines,” the “operating conditions or parameters, such as time, weather, traffic load, path loss and/or interference level” (associated information) affecting communication between the mobile unit and base station. Garceran, 2:34-42, 6:31-44, 59-62. The handset then “transmit[s] the [GPS] location information and associated signal quality or other information,” an indication of the signal

interference, “to a serving base station 54 (FIG. 2) over a channel on the reverse link.” Garceran, 2:39-42, 6:31-44, 59-62.

Chern and Garceran are analogous art to the ’416 patent because they are directed to the same technical field: location-based services for wireless communication devices. *Compare* Ex. 1001, 4:34-51, 5:4-5, *with* Chern, Abstract, [0040], [0044], [0051]-[0053]; Garceran, Abstract, 1:8-11; Decl. ¶¶ 65, 70.

B. Claims

1. Independent claim 1

a. [1preamble]: “A method, comprising:”¹

Chern discloses [1preamble] because Chern discloses a “a location-based information retrieval system and method for wireless communication devices” and a method for requesting and receiving directions over a network. Chern, [0027], [0044]-[0054, FIG.3; Decl. ¶ 81.

b. [1a]: “receiving, by a mobile communication device, information about a current location of the mobile communication device, wherein the information about the current location includes global positioning system (GPS) information;”

Chern discloses [1a] because Chern discloses receiving, at a “wireless handset,” a “user’s current location as determined by [a] position determination

¹ Petitioner does not concede the preamble is limiting. If Patent Owner argues it is, Chern discloses it.

system” wherein the position determination system is “implemented using a GPS (global positioning system) or differential GPS.” Chern, [0040], [0045]. The handset includes “a GPS receiver 304 that functions as the position determination device” and a handset “[a]ntenna 310 allows GPS receiver 304 to communicate with the constellation of GPS satellite.” Garceran, [0084]; Decl. ¶ 82.

- c. **[1b]-[1c]: “detecting, by the mobile communication device, signal interference; generating, by the mobile communication device, an indication of the signal interference;”**

Chern in combination with Garceran renders obvious [1b]-[1c]. Decl. ¶¶ 83-92.

Chern discloses detecting additional information that would improve the accuracy of its position determination system and navigation application, including detecting handset “height, speed of travel, and any other useful location or position parameters” and sending both the GPS and additional information to a server via a wireless network comprised of base stations. Chern, [0040], [0043]-[0044], [0069]. Chern states that “a speed of travel parameter is provided by handset 130 along with the current position” to allow the server to determine whether it needs to “update the position information” for direction calculation purposes. Chern, [0054].

Although Chern discloses that “any other useful location or position parameters” can also be used to determine the handset’s location or position, Chern

does not expressly disclose detecting signal interference or generating an indication of the signal interference. Chern, [0040]. But Garceran does.

Garceran teaches “a wireless communications system” that “determines and/or receives [GPS] location information for the wireless unit along with other information associated with the location information.” Garceran, 2:12-15, 6:39-44.

Like Chern, and as illustrated in Figure 4, Garceran’s “wireless unit 70 includes GPS receiver circuitry 72 which receives GPS signals from a duplexer 74 which is connected to the antenna 76 of the wireless unit 70.” Garceran, 6:31-44. “[T]he GPS receiver circuitry 72 provides a location information which can include time, speed, distance and/or direction for the wireless unit to the processing circuitry 78 of the wireless unit 70.” Garceran, 6:39-44. And like Chern, Garceran’s communication device is configured to communicate the GPS information to one or more base stations of a wireless network. Garceran, 6:59-62.

Because “[a] change in operating condition could trigger a dynamic change in the RF coverage provided by the serving base station(s) and/or neighboring base stations to the wireless unit(s) in the location or range of location” the wireless unit also (1) “determines” (detects) the “operating conditions or parameters, such as time, weather, traffic load, path loss and/or interference level” (associated information) affecting the communication signal and (2) “transmit[s] the [GPS]

location information and associated signal quality or other information” i.e., a generated indication of the signal interference, “to a serving base station 54 (FIG. 2) over a channel on the reverse link. Garceran, 2:39-42, 6:31-44, 59-62 (emphasis added).

This is consistent with the ’416 patent, which does not use the term “generating an indication of signal interference” but does explain that “the client may also transmit local ‘raw’ information” including information about “power and/or type of cellular reception ... interference from a ... radio transmitter” or “cellular or other type[s] of information.” Ex. 1001, 5:42-6:10. Thus, POSITA would have understood that a *transmission* conveying the signal interference information is a *generated* indication of the detected signal interference because the client (mobile communication device) generates the transmission, and the transmission indicates the nature of the signal interference.

i. Motivation to Combine Garceran’s Detection of Signal Interference with Chern’s System

A POSITA would have understood the benefit of sending the associated signal quality (indication of interference) in addition to the GPS information to enhance position detection for navigation using a cellular phone because systems using cellular signal information to enhance position determination for navigation were known in the art. Decl. ¶ 90 (citing Kitching, 3, 7, 12- 13 (describing systems and methods for enhancing position detection in navigation applications “utilising

both GPS and [base station (BS)] cellular measurements” and explaining that “[t]he combination of GPS and cellular technologies ... affords improved positioning capabilities over a range of operating environments that neither system alone can achieve” and “improved transmitter geometry in areas where signal blockage may occur.”); *see also* Kitching, 9 (describing earlier systems “that combine GPS and cellular systems” to “give improved positioning performance.”); Djuknic, 1 (“assisted-GPS technology offers superior accuracy, availability, and coverage at a reasonable cost.”), 3 (explaining that “interference” has “noticeable effects” on “the accuracy of geolocation technologies” and using “Hybrid approaches that use multiple geolocation technologies appear to be the most robust solution to problems of accuracy and coverage ... AGPS provides a natural fit for hybrid solutions because it uses the wireless network to supply assistance data to GPS receivers in handsets” and listing additional advantages of combining base station and GPS location technologies (Assisted GPS or AGPS) for location-based services).

Thus, a POSITA would have been motivated and found it obvious to configure Chern’s handset to use multiple sources of position information, including an “associated signal quality or other information,” taught by Garceran, to improve location determination and the location-based services of Chern. Decl.

¶ 91. Such an improvement would have been especially useful where

environmental conditions, e.g., weather or building structures, limit, block, or otherwise prevent the GPS receiver from acquiring information from the GPS satellite. Kitching, 9-13; Djuknic, 1-3; Decl. ¶ 91.

ii. Expectation of Success

A POSITA would have also had a reasonable expectation of success in configuring Chern's handset to detect signal interference and generate an indication of the signal interference, as evidenced by Garceran, 6:31-44, 59-62, 15:6-12 ("the RF coverage system can be implemented ... in application specific integrated circuits, software-driven processing circuitry, firmware or other arrangements of discrete components as would be understood by one of ordinary skill in the art with the benefit of this disclosure."); *see also* Chern, [0082] (explaining that location-based service methods "may be implemented as computer programs, software or hardware" and functions relating to handset "may be coded in processor 104 or could be stored in memory 114."); Kitching, 9-13 (highlighting experimental results demonstrating the utility and benefits of combining GPS and base station position information, and further discussing system modifications that may be required to implement the modification); Djuknic, 1-2 (describing ways to implement the combined technologies); Decl. ¶ 92.

- d. **[1d]: “communicating, by the mobile communication device, with a remote source over a wireless network, wherein said communicating comprises sending both the indication of the signal interference and the GPS information from the mobile communication device to the remote source;”**

Chern and Garceran render obvious [1d] because the combination teaches transmitting the GPS location information and associated signal quality or other information to a base station over a wireless network. Garceran, 6:31-44, 59-62; Chern, [0043]-[0044]; Decl. ¶¶ 93-96.

As explained for [1b]-[1c], Garceran discloses transmitting (communicating) “the [GPS] location information and associated signal quality or other information” (an indication of the signal interference) “to a serving base station 54 (FIG. 2)[,]” a remote source, over a channel on the reverse link.” Garceran, 6:31-44, 59-62 (emphasis added).

Chern likewise discloses transmitting the handset’s “determined” location “to server 136 over wireless network 140” comprised of base stations. Chern, [0043]-[0044].

As explained for [1b]-[1c], a POSITA would have been motivated and found it obvious to transmit multiple sources of position information, including the GPS information and an “associated signal quality or other information” (indication of signal interference), as taught by Garceran, to improve location determination and the location-based services of Chern. *Kitching*, 9-13; *Djuknic*, 1-3; Decl. ¶ 95.

A POSITA would have had a reasonable expectation of success in sending both types of information to the server because doing so would have merely required using existing conventional components (Chern's handset transceiver) for its intended conventional use (transmitting the handset's determined location to the server). Chern, [0007], [0034], [0044]; Decl. ¶ 96.

- e. **[1e]: “receiving, by the mobile communication device, navigation information from the remote source in response to sending both the indication of the signal interference and the GPS information, wherein the navigation information comprises data for plotting a course on a map including the current location of the mobile communication device;”**

Chern in combination with Garceran renders obvious [1e] because the combination teaches receiving driving directions to a destination (navigation information) from the base station in response to sending the GPS location and associated signal quality (indication of signal interference) information. Garceran, 6:31-44, 59-62; Chern, [0043]-[0044]; Decl. ¶¶ 97-102.

As explained for [1d], Chern as modified by Garceran teaches sending the GPS information and an “associated signal quality or other information” (indication of signal interference) to a remote source. Garceran, 6:31-44, 59-62; Chern, [0043]-[0044].

Chern discloses transmitting from the server and receiving at the handset “driving directions to a destination address” (navigation information) based on the handset’s determined location. Chern, [0044]-[0054].

First, when “[t]he user requests driving directions to [a] destination ... the request is communicated to server 136 over wireless network 140” along with “the [determined] handset location ... to provide a starting point for the directions.” Chern, [0044]. The determined handset location, as discussed for [1b], is based on GPS and an indication of signal interference, as taught by the combination.

Next, “[u]sing the handset location and the destination address” Chern’s server “calculates a route and compiles driving directions” to the “destination address.” Chern, [0044]. That is, Chern’s server generates a “route” and “driving directions” (navigation information comprising data for plotting a course on a map) from a “starting point” corresponding to the “determined” “handset location” (including the current location of the mobile communication device) to the destination.

Then, the driving directions (navigation information comprising data for plotting a course on a map) are received by “handset 130 over network 140 and are displayed or audibly rendered to the user” as “textual driving directions[and] a map showing the route.” Chern, [0044].

f. [1f]: “and displaying, by the mobile communication device, the map based on the navigation information.”

Chern in combination with Garceran renders obvious [1f] because Chern discloses displaying “a map showing the route” (navigation information) calculated and transmitted by the server “on the handset display.” Chern, [0044]. Decl. ¶ 103.

2. Claim 3: “The method of claim 1, wherein the navigation information comprises additional information about an area around the current location.”

Chern discloses claim 3 because Chern discloses that the directions/route (navigation information) may contain “additional traffic monitoring” information (additional information) corresponding to the route, including the area around the starting point, or detected current locations. Chern, [0061], [0067], [0070]; Decl. ¶ 104.

For example, when “traffic monitoring service is selected, handset 130 periodically sends its location to server 136 while in transit according to the driving directions, and server 136 determines whether there are any impediments such as accidents or construction work along the calculated route.” Chern, [0067]. Thus, Chern’s navigation information includes traffic information (additional information) about an area around the current location along the route.

3. **Claim 4: “The method of claim 1, wherein the navigation information comprises first mapping information associated with a first time centered around a first local position, and wherein the method comprises receiving, by the mobile communication device, additional navigation information comprising second mapping information associated with a second time centered around a second location different than the first local position.”**

Chern discloses claim 4 because Chern discloses that the computed route (navigation information) includes “a starting point” corresponding to the determined handset location (first mapping information associated with a first time centered around a first local position) and “directions to a destination address,” including an “alternative route” or “backtrack route” (additional navigation information comprising second mapping information) if “a freeway exit or other waypoint in the route” (second location) “has been passed.” Chern, [0044], [0054]; Decl. ¶¶ 105-107.

The “alternative route” or “backtrack route” (second mapping information) is associated with a second time because it is received by the handset *after* the user/handset has left the starting point and *if* the user passes a designated waypoint or freeway. Chern, [0054]. This second time is likewise centered around a second location (the waypoint or freeway) that is different from the first local position (the starting point). Chern, [0054].

Accordingly, “where the user is approaching a freeway exit or other waypoint in the route being computed, server 136 may request a position update,”

(second location information at a second time) “to ensure that this waypoint has not been passed.” Chern, [0054]. “If it has been passed, an alternative route may be calculated or the user may be directed to backtrack to the passed waypoint[,]” that is, the server calculates and transmits additional navigation information comprising second mapping information (alternative or backtrack route) associated with the second time and location past the waypoint. Chern, [0054].

4. **Claim 5: “The method of claim 4, wherein the first mapping information is associated with a first direction of travel from the second local position to the first local position, and wherein the second mapping information is associated with a second direction of travel from the first local position to the second local position.”**

The ’416 patent does not describe what entails first mapping information “associated with a first direction of travel from the second local position to the first local position” or second mapping information “associated with a second direction from the first local position to the second local position” but it does explain that a “return path” may be used “to guide the user back to their” previous location. Ex. 1001, 7:43-47; Decl. ¶ 108.

Chern discloses claim 5 because, like the ’416 patent, it discloses providing a path for returning, i.e., backtracking to a previous location. Chern, [0054]; Decl. ¶¶ 109-111.

As explained for claim 4, Chern discloses a “starting point” corresponding to the determined handset location (first mapping information associated with a first

time centered around a first local position). Chern, [0044], [0054]. The first mapping information is also *associated* with a first direction of travel from the “waypoint” (second local position) to the “starting point” (first local position). Chern, [0054]; Decl. ¶ 110. Thus, when the user passes the waypoint, the handset receives directions to “backtrack” towards the waypoint (and consequently, the starting point) and the user is “directed to backtrack to the passed waypoint.” Chern, [0054].

The backtrack route (second mapping information) is similarly *associated* with a second direction of travel from the starting point (first local position) to the waypoint (second local position) because it reflects the opposite traveling direction. Chern, [0054]; Decl. ¶ 111.

5. Claim 9: “The method of claim 1, wherein the signal in[ter]ference is indicative of a noise signature associated with the current location.”

Chern in combination with Garceran renders obvious claim 9 because Garceran’s interference is associated with, i.e., indicative of, “certain transmit power and frequencies given certain operating conditions or parameters, such as time, weather, traffic load, path loss and/or interference level” and “linked with additional parameters, such as wireless unit type, wireless unit identity, frequency, operating conditions and/or base station identity.” Garceran, 2:25-42. Thus, in

combination, Chern's handset would implement Garceran's detection of signal interference as a noise signature. Decl. ¶¶ 112-113.

This is consistent with the '416 patent, which explains that "[e]ach specified type of interference may have a specified different kind of signature. For example, the hum from a power line may be one kind of signature; noise and/or interference from a train, power generating station, or radio transmitter may represent another kind of signature." Ex. 1001, 5:65-6:3 (emphasis added); Decl. ¶ 111.

6. Claim 10: "The method of claim 1, wherein the signal interference is indicative of a signal power of one or more signals received by the mobile communication device."

Chern in combination with Garceran renders obvious claim 10 because, as explained for claim 9, Garceran's interference is associated with, i.e., indicative of, "certain transmit power and frequencies given certain operating conditions or parameters, such as time, weather, traffic load, path loss and/or interference level" and "linked with additional parameters, such as wireless unit type, wireless unit identity, frequency, operating conditions and/or base station identity." Garceran, 2:39-42 (emphasis added). Decl. ¶ 114 Thus, in combination, Chern's handset would implement Garceran's detection of signal interference as a signal power of the received signal. Decl. ¶ 114.

7. Independent Claim 11

a. [11preamble]: “A method, comprising:”

Chern discloses [11preamble] because Chern discloses “a location-based information retrieval system and method for wireless communication devices” and method for requesting and receiving directions over a network. Chern, [0027], [0044]-[0054], FIG. 3; Decl. ¶ 115.

b. [11a]: “receiving, by a server, position information from a mobile communication device,”

Chern discloses [11a] because, as explained for [1d], Chern discloses transmitting a handset’s (mobile communication device) “determined” location “to server 136 over wireless network 140.” Chern, [0044]. Decl. ¶ 116.

c. [11b]: “wherein the position information includes global positioning system (GPS) information and additional information about a local position of the mobile communication device other than the GPS information, wherein the additional information comprises an indication of signal interference detected at the mobile communication device;”

Chern in combination with Garceran renders obvious [11b]. Decl. ¶¶ 117-122.

As explained for [1b], Chern discloses transmitting position information corresponding GPS information to a server. Chern, [0040], [0045], [0084]. For example, when the user requests directions to a destination, “the request is communicated to server 136 over wireless network 140” and “the handset location

determined by position determination system 134 is also provided to server 136 to provide a starting point for the directions.” Chern, [0044].

As explained in [1c], Chern discloses detecting additional information at the handset that would improve the accuracy of its position determination system and sending both the GPS and additional information to a server. Chern, [0040]. For example, “[i]n one implementation, a speed of travel parameter is provided by handset 130 along with the current position” to allow the server to determine whether it needs to “update the position information” for direction calculation purposes. Chern, [0054]. Although Chern discloses that “any other useful location or position parameters” detected at the handset can also be used to determine the handset’s location or position, Chern does not disclose that the additional information includes an indication of signal interference. Chern, [0040].

Garceran renders obvious additional information comprising an indication of interference, as also explained for [1b]-[1c], because Garceran’s handset (1) “determines,” i.e., detects, at the wireless unit, “operating conditions or parameters, such as time, weather, traffic load, path loss and/or interference level” (associated information) and (2) “transmit[s] the [GPS] location information and associated signal quality or other information” i.e., an indication of the signal interference, “to a serving base station 54 (FIG. 2)” so that it is received by a remote source. Garceran, 2:39-42, 6:31-44, 59-62; Decl. ¶ 120.

i. Motivation to Combine Garceran’s Detection of Signal Interference with Chern’s System

As explained for [1c], a POSITA would have understood the benefit of sending the associated signal quality (indication of interference) in addition to the GPS information, and would have been motivated and found it obvious to configure Chern’s handset to use multiple sources of position information, including an “associated signal quality or other information,” taught by Garceran, to improve location determination and the location-based services of Chern. Decl. ¶ 121 (citing Kitching, 3, 7, 9, 12-13; Djuknic, 1-3). Such an improvement would have been especially useful where environmental conditions, e.g., weather or building structures, limit, block, or otherwise prevent a GPS receiver from acquiring information from GPS satellites. Kitching, 9-13; Djuknic, 1-3.

ii. Expectation of Success

As explained for [1c], configuring Chern’s handset to detect signal interference, and generate/transmit an indication of the signal interference would have only required routine skill to implement. Garceran, 6:31-44, 59-62; *see also* Chern, [0082] (explaining that location-based service methods “may be implemented as computer programs, software or hardware” and functions relating to handset “may be coded in processor 104 or could be stored in memory 114.”); Kitching, 9-13 (highlighting experimental results demonstrating the utility and benefits of combining GPS and base station position information, and further

discussing system modifications that may be required to implement the modification); Djuknic, 1-2 (describing ways to implement the combined technologies). Thus, a POSITA would have also had a reasonable expectation of success in modifying the server to receive the position information including GPS and signal quality (indication of interference). Decl. ¶ 122.

- d. **[11c]-[11d]: “determining, by the server, navigation information associated with the local position based on both the GPS information and the indication of signal interference, wherein the navigation information comprises data for plotting a course on a map including the local position of the mobile communication device”**

Chern in combination with Garceran renders obvious determining, by the server, navigation information associated with the local position based on both the GPS information and the indication of signal interference for the reasons explained for [1e]. Decl. ¶¶ 123-124.

Chern’s server generates a “route” and “driving directions” (navigation information comprising to data for plotting a course on a map) from a “starting point” corresponding to the “determined” “handset location” (including the current location of the mobile communication device). Chern, [0044].

- e. **[11e]: “and transmitting, by the server, the navigation information to the mobile communication device.”**

Chern in combination with Garceran renders obvious transmitting, by the server, the navigation information to the mobile communication device, because

Chern discloses transmitting the driving directions (navigation information) to “handset 130 over network 140” where they are displayed or audibly rendered to the user” as “textual driving directions[and] a map showing the route.” Chern, [0044]; Decl. ¶ 125.

8. **Claim 12: “The method of claim 11, further comprising: receiving, by the server, new position information indicating a new position of the mobile communication device; and transmitting, by the server, new navigation information associated with the new position to the mobile communication device responsive to receiving the new position information.”**

Chern discloses claim 12 because Chern discloses a “repetitive prompting process” whereby the handset provides “updated position information ... to server 136” based on “time elapsed and distance traveled” and the server transmits new navigation information based on the updated position and “additional data or information [retrieved] from a database.” Chern, [0052]-[0054]; Decl. ¶¶ 126-127.

For example, “where the user is approaching a freeway exit or other waypoint in the route being computed, server 136 may request a position update,” i.e., new position information indicating a new position of the handset, “to ensure that this waypoint has not been passed.” Chern, [0054]. “If it has been passed, an alternative route may be calculated or the user may be directed to backtrack to the passed waypoint[,],” that is, the server calculates and transmits new navigation

information (alternate route or reverse route) to handset based on the new position information indicating the handset passed the waypoint. Chern, [0054].

9. **Claim 13: “The method of claim 12, wherein transmitting the navigation information comprises transmitting first mapping information at a first time associated with the local position, and wherein transmitting the new navigation information comprises transmitting second mapping information at a second time associated with the new position.”**

Chern discloses claim 13 because Chern’s disclosure of transmitting the route (navigation information) to the handset, as explained for claim 12, includes transmitting a “computed” route “based on the user’s current position” (first mapping information at a first time associated with the local position) and transmitting an “an alternative route” or “backtrack” route (second mapping information) if “a position update” indicates a waypoint on the computed route “has been passed” (at a second time associated with the new position). Chern, [0054]; Decl. ¶ 128.

VI. Ground 2: Claim 6 is Obvious Over Chern, Garceran, and Ihara.

A. Ihara

Ihara, filed July 26, 2000, is prior art under at least 35 U.S.C. § 102(e).

Ihara teaches a method for providing “route guidance by using a standard communications protocol” such as XML. Ihara, 2:64-67, 10:14-18. The information is transmitted in “a tag format indicating attributes and contents of the

information in accordance with the communications protocol” including tags for “specify[ing]” “coordinates information on a position” and the “form (type) of content[] ... such as text data, image data, audio data, video data.” Ihara, Abstract, 6:11-43, 10:65-11:15, 11:35-44. The format ensures that a “terminal device is capable of receiving, using the standard communications protocol, various [kinds of] information in the suitable format for the route guidance.” Ihara, Abstract, 10:65-11:15, 11:35-42.

Ihara is analogous art to the ’416 patent because it is directed to the same technical field: location-based services for wireless communication devices.

Compare Ex. 1001, 4:34-51, 5:4-5, *with* Ihara, Abstract, 2:64-67, 10:14-18. Decl. ¶ 73.

B. Claims

1. **Claim 6: “The method of claim 1, wherein at least a portion of the GPS information is communicated in XML format and comprises one or more different XML tags that indicate a type of the additional information being communicated by the mobile communication device.”**

Chern in combination with Ihara renders obvious claim 6. Decl. ¶¶ 129-133.

Chern discloses communicating the GPS information in the format illustrated in FIG 6 or “other message formats and field lengths” “[a]s would be apparent to one of ordinary skill in the art.” Chern, [0088]-[0089]. A POSITA would have understood that XML format including XML tags was a common

format for such communications at the relevant time. Decl. ¶ 130 (citing Brown, 5:44-48 (“Data exchange across the communications medium is advantageously performed in at least one of multiple available data transmission protocols and is preferably supported by a common data structure format, such as the extensible mark-up language (XML) data structure format.”); Maeda, 12:51-58 (guiding information “can be described in the description format of a markup language such as a general-purpose XML (extensible markup language) as a sequence of instructions representable in time series, thereby easily and conveniently processing and outputting the guiding information.”)).

Ihara uses XML format and tags for communicating GPS and other “route guidance” information. Ihara, 2:64-67, 10:14-18; Decl. ¶ 131. The information is transmitted in “a tag format indicating attributes and contents of the information in accordance with the communications protocol” including tags for “specifying” “coordinates information on a position” and the “form (type) of content[] ... such as text data, image data, audio data, video data.” Ihara, Abstract, 6:11-43, 10:65-11:15, 11:35-44. The format ensures that a “terminal device is capable of receiving, using the standard communications protocol, various [kinds of] information in the suitable format for the route guidance.” Ihara, Abstract, 10:65-11:15, 11:35-42.

A POSITA would have been motivated and found it obvious to communicate the GPS and noise (additional information²) in XML format, whereby tags such as “audio data” are used to indicate the type of the additional information (noise) being communicated, because XML is a “standard communications protocol” known for its suitability for transmitting position information, as expressly disclosed by Ihara. Decl. ¶ 132.

A POSITA would have had a reasonable expectation of success in implementing XML formatting, as disclosed by Ihara, to transmit the navigation and additional information because XML is a “standard” protocol that would have only required routine skill to implement. *See also* Brown, 5:44-48; Maeda, 12:51-58; Decl. ¶ 133.

VII. Ground 3: Claims 17-19 Are Obvious Over Yamakita.

A. Yamakita

Yamakita, filed September 19, 1997, and published February 27, 2001, is prior art under at least 35 U.S.C. § 102(e). Yamakita discloses systems and methods “for analyzing the action of, e.g., a user who is carrying a portable terminal on the basis of information acquired from the portable terminal.”

Yamakita, 1:4-6. The portable terminal acquires position information using a GPS sensor and “unique” train sound information corresponding to the “ambient sound

² There is no antecedent basis for the term “additional information.”

data (e.g., noise)” using a microphone. Yamakita, 2:54-58, 3:33-40, 48-51, 4:55-56, FIGS. 2-3. The portable terminal generates and transmits a transmission packet containing the location and noise data to a base station and host terminal (collectively, “remote source”) over a public wireless network. Yamakita, 2:47-52, 3:3-9, 3:53-60, FIGS. 1, 3, 4 (illustrating contents of the transmission packet).

“Upon receiving the information transferred from the portable terminal,” the host terminal “extract[s]” and processes the GPS and sound (interference) data from the transmission packet to estimate “the position of the user who is carrying the portable terminal 1 at a certain time point, and if he/she is moving, [and] the [user’s] moving means.” Yamakita, 5:64-6:9, 6:37-45, FIG. 7. Once processed, the host terminal generates and transmits a data packet containing the user’s current location to the portable terminal. Yamakita, 6:37-45, 1:41-48. The data packet also includes an action record table, i.e., navigation information including data for plotting a course on a map including the portable terminal’s current location. Yamakita, 6:38-46, 1:41-48, FIGS. 14, 18. The portable terminal extracts the action record table and displays it as a map on its LCD display unit. Yamakita, 9:63-10:4, 11:28-31, FIG. 18.

Yamakita is analogous art to the ’416 patent because it is directed to the same technical field: location-based services for wireless communication devices. *Compare* Ex. 1001, 4:34-51, 5:4-5, *with* Yamakita, Abstract, 1:4-6; Decl. ¶ 77.

B. Claims

1. Independent Claim 17

a. [17preamble]: “A method comprising:”

Yamakita discloses [17preamble] because Yamakita discloses a method “for analyzing the action of, e.g., a user who is carrying a portable terminal on the basis of information acquired from the portable terminal.” Yamakita, 1:4-6; Decl. ¶ 134.

b. [17a]: “acquiring, by a communication device, a plurality of items of information representing a current location of the communication device, wherein the plurality of items of information comprises global positioning system (GPS) information and environmental information associated with the current location,”

Yamakita discloses [17a] because the portable terminal, a communication device, acquires “pieces,” i.e., a plurality of items, of information such as GPS, sound, and image information, representing a current location of the portable terminal. Yamakita, FIG. 1, Abstract, 2:54-63, 4:21-34; Decl. ¶¶ 135-137.

For example, the portable terminal acquires GPS information using a “GPS sensor,” that “detects the position (e.g., aa°bb’ north and cc°dd’ east) of the portable terminal 1 at a certain time point” Yamakita, 2:54-58, 3:48-51.

The portable terminal also uses a microphone 12 to collect “ambient sound data (e.g., noise)” and a camera to “acquire” “image information as ambient information.” Yamakita, 4:28-30, 4:32-34, 4:55-56. Thus, when the portable terminal is located at a train station, “sounds unique to the train” are detected “at

the timing when the position information is detected.” Yamakita, 3:3-6, 3:48-51, 4:28-34, 6:26-33. The image information and “unique” train sound information corresponding to the “ambient sound data (e.g., noise)” detected “at the tim[e]” the user is “in a station” are environmental information as described in the ’416 patent. Ex. 1001, 6:11-16, claim 19 (“wherein the environmental information comprises sound data captured by the microphone”); Yamakita, 3:3-6, 3:48-51, 4:28-34, 4:55-56, 6:26-33.

c. [17b]: “and wherein the environmental information is acquired by one or more sensory input devices of the communication device;”

Yamakita discloses [17b] because the sound and image information (environmental information) are acquired by a microphone and camera, respectively (one or more sensory input devices). Yamakita, 6:26-33; Decl. ¶¶ 138-140.

For example, Yamakita explains that “[i]n detecting the position information, the portable terminal 1 fetches sound information acquired through the microphone 12.” Yamakita, 6:26-33.

Yamakita’s microphone is a sensory input device within the meaning of the ’416 patent. Ex. 1001, 6:11-16 (describing a microphone for receiving environmental information in the form of sound).

- d. **[17c]: “communicating, by the communication device, the plurality of items of information, including the GPS information and the environmental information associated with the current location, to a remote server;”**

Yamakita discloses [17c] because the position (GPS) and sound and image (environmental) information (collectively, “plurality of items of information”) are compiled into a “transmission packet” and transmitted, i.e., communicated, to a “host terminal (server machine) 3 accommodated in a public network 2” (remote server). Yamakita, 2:47-52, 3:53-60, FIG. 4 (illustrating the transmission packet); Decl. ¶¶ 141-142.

More specifically, Yamakita’s portable terminal uses a radio transceiver to transmit (communicate) a transmission packet containing the location estimated by the GPS sensor (GPS information) and sound information (environmental information) to a host terminal (remote server) over a public wireless network. Yamakita, 2:47-52, 3:3-9, 3:53-60, FIGS. 1, 3, 4 (illustrating contents of the transmission packet).

FIG.1

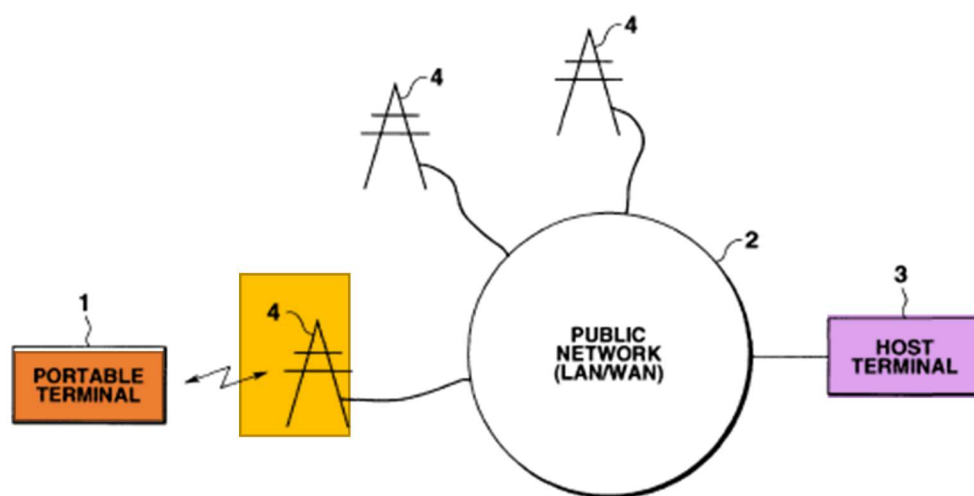


FIG.3

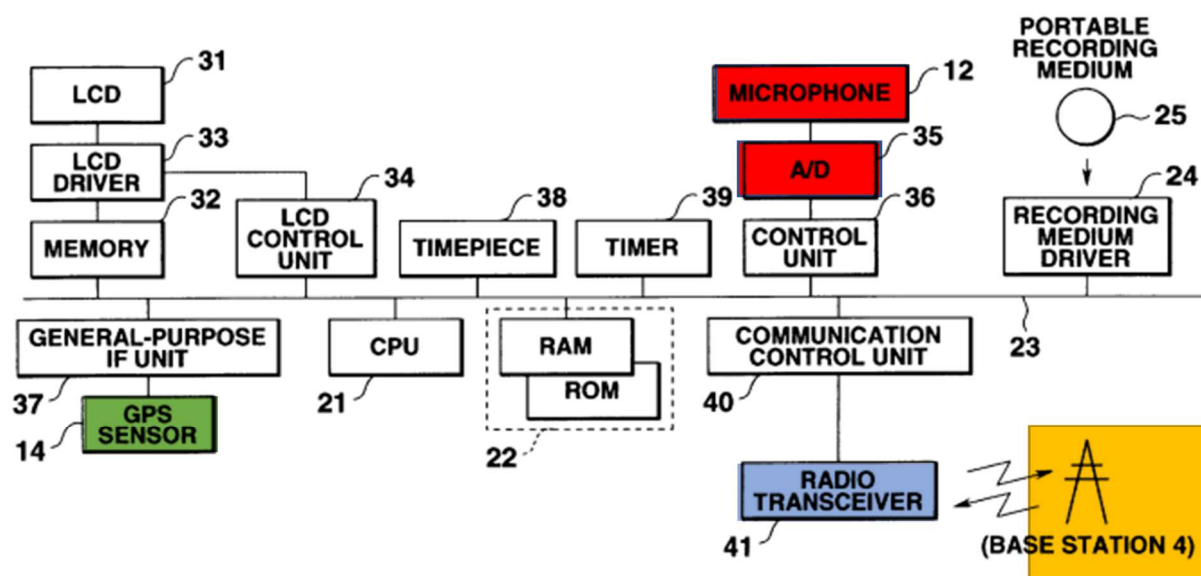
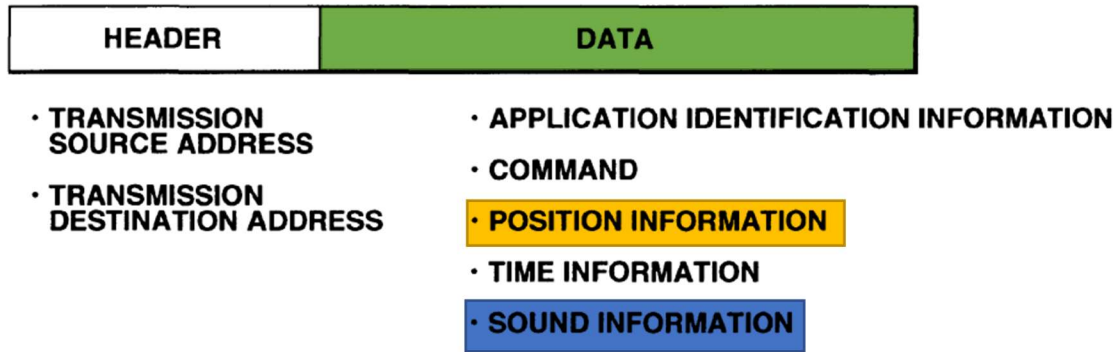


FIG.4



Yamakita, FIGS. 1, 3, 4.

- e. [17d]: “receiving, by the communication device, current position information in response to communicating the plurality of items of information, wherein the current position information comprises data for plotting a course on a map including the current location of the communication device;”

Yamakita discloses [17d] because the portable terminal receives an action record table including current position information and data for plotting a course on a map that includes the current location of the portable terminal in response to transmitting GPS and environmental information. Yamakita, 1:41-48, 6:37-45, 9:46-48, FIGS. 7, 14; Decl. ¶¶ 143-148.

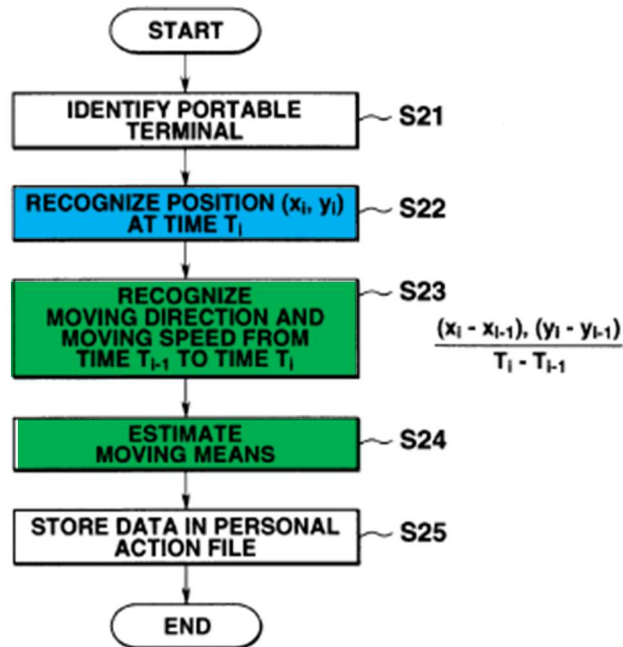
The process corresponding to [17d] can be summarized in three steps: **First**, Yamakita’s host terminal processes the GPS and sound (environmental information) received from the portable terminal to determine a location of the

portable terminal along a route at a particular time; **then**, Yamakita's host terminal generates an action table (current position information) including the portable terminal's current location (e.g., position (x1, y1) detected at time t1) and subsequent locations (e.g. position (x2, y2) detected at time t2) based on the processed information; **finally**, Yamakita's portable terminal receives a transmission packet containing the generated action table from the host terminal. Yamakita, 5:64-6:9, 6:37-45, 9:46-51, 9:63-10:4. FIGS. 7, 9, 14, 16, 18.

For step 1, “[u]pon receiving the information transferred from the portable terminal,” the host terminal “extract[s]” and processes the GPS and sound (environmental) data from the transmission packet to estimate “the position of the user who is carrying the portable terminal 1 at a certain time point, and if he/she is moving, [and] the [user's] moving means.” Yamakita, 5:64-6:9, 6:37-45, FIGS. 7, 14, 18.

In step 2, Yamakita's host terminal uses the processed GPS and sound information to “analyze the moving route” “of the user who is carrying the portable terminal 1” to compile an “action record table” reflecting the user's current position, route, and mode of transportation, i.e., current position information including data for plotting a course on a map. Yamakita, 1:41-48, 6:37-45, 9:46-48, FIGS. 7, 14 (action table/current position information). Figure 7, annotated below, illustrates a process for analyzing the GPS and environmental information.

FIG.7



Yamakita, FIG. 7

At [step S22](#) of Figure 7, the host terminal processes the portable terminal's GPS information—the “position information and time information, which are stored in the data portion of the received packet, are extracted to recognize the position (x_i,y_i) of the portable terminal 1 at time T_i.” Yamakita, 5:65-6:1. At [steps S23-24](#) of Figure 7, the host terminal processes the “sound information stored in the data portion of the received packet,” (environmental information) to determine the portable terminal's “moving means (walking, train, motor vehicle, stop, ...).” Yamakita, 6:1-14.

Yamakita's host terminal compares the extracted, processed information to the "map data" illustrated in Figure 9 and the local information "data table" illustrated in Figure 16 to generate an action record table (current position information) according to the process of Figure 15. Yamakita, 6:37-45 (explaining that "the host terminal 3 executes the processing of the flow chart shown in FIG. 7 to analyze the moving route of the user who is carrying the portable terminal 1" and "has map data as shown in FIG. 9" and "[f]or the purpose of analyzing the route."), 9:2-48 (explaining that "[t]he table shown in FIG. 16 stores various names on the map and corresponding position information," and the "extracted" position information is "checked" by "refer[ring]" to the table shown in Figure 16), FIGS. 9, 7, 15, 16. Thus, the action table comprises "data" for plotting a course on a map including the current location of the mobile communication device.

FIG.14

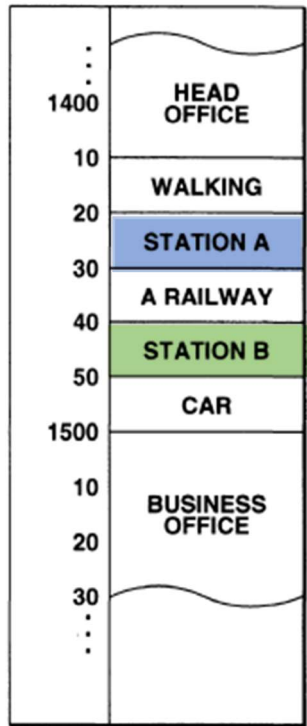


FIG.16

REGISTRATION POSITION	NAME
X ₁₀₁ , Y ₁₀₁	STATION A
X ₁₀₂ , Y ₁₀₂	STATION B
⋮	
X ₅₀₁ , Y ₅₀₁	HEAD OFFICE
X ₅₀₂ , Y ₅₀₂	BUSINESS OFFICE
X ₅₀₃ , Y ₅₀₃	MR. K'S HOME
⋮	

USER REGISTRATION DATA {

Yamakita, FIGS. 14, 16 (illustrating action table and corresponding data).

In step 3, the host terminal transfers the action record table in a data packet to the portable terminal. Yamakita, 9:46-51, 9:63-10:4. When the portable terminal receives the packet, it “extracts the action record table from the packet transferred from the host terminal 3 and displays it on the [portable terminal’s] LCD display unit 11.” Yamakita, 9:46-51, 9:63-10:4, 11:28-31, FIG. 18.

FIG.18



Yamakita, FIG. 18 (illustration displayed on portable terminal LCD).

- f. [17e]: “and displaying, by the communication device, the map based on the current position information.”

Yamakita renders obvious [17e] because the received and displayed illustration (as seen in Figure 18) is a map based on the action record table (current position information). Yamakita, 9:46-51, 9:63-10:4, 11:28-31, FIG. 18;

Decl. ¶¶ 149-151.

As explained for [17d], Yamakita’s portable terminal extracts the received action record table (current position information including data for plotting a course on a map) and displays it as an illustration on its LCD display unit.

Yamakita, 9:63-10:4, 11:28-31, FIG. 18.

FIG.18



Yamakita, FIG. 18 (illustration displayed on LCD).

A POSITA would have understood that Yamakita's action record table illustration is a map because it provides visual guidance for directing the user from their current location (e.g., station A) to a destination (e.g., business office), and the illustration corresponds to "various names on the map and corresponding position information" and "map data." Yamakita, 6:37-45, 9:4-6; Decl. ¶ 149.

2. Claim 18: "The method of claim 17, wherein the communication device comprises a camera and wherein the environmental information comprises image data captured by the camera."

As explained for claim [17a], the portable terminal acquires environmental information associated with the current location. Yamakita, FIG. 1, Abstract, 2:54-63, 4:21-34. The environmental information also includes "image information" (image data) captured by the portable terminal's camera. Yamakita, 4:28-34, 4:55-56 ("The sound information is sound data acquired through the microphone 12 at the timing when the position information is detected ... However, a ... camera may be arranged to acquire ... image information as ambient information."); Decl. ¶ 152.

3. Claim 19: "The method of claim 17, wherein the communication device comprises a microphone and wherein the environmental information comprises sound data captured by the microphone."

As explained for claim 17, the environmental information includes "ambient sound data (e.g., noise) collected through the microphone" of the portable terminal

(communication device). Yamakita, 4:28-30, 4:55-56. Thus, Yamakita's portable terminal (communication device) includes a microphone 12, and the noise (environmental information includes "ambient sound data" "collected through" (captured by) the microphone. Yamakita, 4:28-30, 4:55-56; Decl. ¶ 153.

VIII. Ground 4: Claims 17-19 Are Obvious Over Yamakita and Chern.

A. Claims

1. Independent Claim 17

a. [17preamble]: "A method comprising:"

Yamakita discloses [17preamble] because Yamakita discloses a method "for analyzing the action of, e.g., a user who is carrying a portable terminal on the basis of information acquired from the portable terminal." Yamakita, 1:4-6; Decl. ¶ 154.

b. [17a]: "acquiring, by a communication device, a plurality of items of information representing a current location of the communication device, wherein the plurality of items of information comprises global positioning system (GPS) information and environmental information associated with the current location,"

Yamakita discloses [17a] because the portable terminal, a communication device, acquires "pieces," i.e., a plurality of items, of information such as GPS, sound, and image information, representing a current location of the portable terminal. Yamakita, FIG. 1, Abstract, 2:54-63, 4:21-34; Decl. ¶¶ 155-157.

For example, the portable terminal acquires GPS information using a “GPS sensor,” that “detects the position (e.g., $aa^{\circ}bb'$ north and $cc^{\circ}dd'$ east) of the portable terminal 1 at a certain time point” Yamakita, 2:54-58, 3:48-51.

The portable terminal also uses a microphone 12 to collect “ambient sound data (e.g., noise)” and a camera to “acquire” “image information as ambient information.” Yamakita, 4:28-30, 4:32-34, 4:55-56. Thus, when the portable terminal is located at a train station, “sounds unique to the train” are detected “at the timing when the position information is detected.” Yamakita, 3:3-6, 3:48-51, 4:28-34, 6:26-33. The image information and “unique” train sound information corresponding to the “ambient sound data (e.g., noise)” detected “at the tim[e]” the user is “in a station” are environmental information as described in the '416 patent. Ex. 1001, 6:11-16, claim 19 (“wherein the environmental information comprises sound data captured by the microphone”); Yamakita, 3:3-6, 3:48-51, 4:28-34, 4:55-56, 6:26-33.

c. [17b]: “and wherein the environmental information is acquired by one or more sensory input devices of the communication device;”

Yamakita discloses [17b] because the sound and image information (environmental information) are acquired by a microphone and camera, respectively (one or more sensory input devices). Yamakita, 6:26-33; Decl. ¶¶ 158-160.

For example, Yamakita explains that “[i]n detecting the position information, the portable terminal 1 fetches sound information acquired through the microphone 12.” Yamakita, 6:26-33. Yamakita’s microphone is a sensory input device within the meaning of the ’416 patent. Ex. 1001, 6:11-16 (describing a microphone for receiving environmental information in the form of sound).

- d. **[17c]: “communicating, by the communication device, the plurality of items of information, including the GPS information and the environmental information associated with the current location, to a remote server;”**

Yamakita discloses [17c] because the position (GPS) and sound and image (environmental) information (collectively, “plurality of items of information”) are compiled into a “transmission packet” and transmitted, i.e., communicated, to a “host terminal (server machine) 3 accommodated in a public network 2” (remote server). Yamakita, 2:47-52, 3:53-60, FIG. 4 (illustrating the transmission packet); Decl. ¶¶ 161-162.

More specifically, Yamakita’s portable terminal uses a radio transceiver to transmit (communicate) a transmission packet containing the location estimated by the GPS sensor (GPS information) and sound information (environmental information) to a host terminal (remote server) over a public wireless network. Yamakita, 2:47-53, 3:3-9, 3:54-62, FIGS. 1, 3, 4 (illustrating contents of the transmission packet).

FIG.1

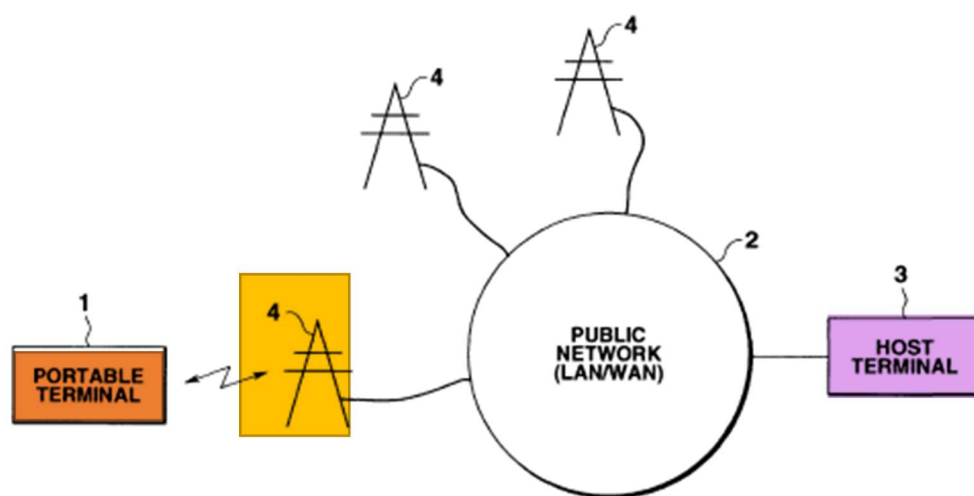


FIG.3

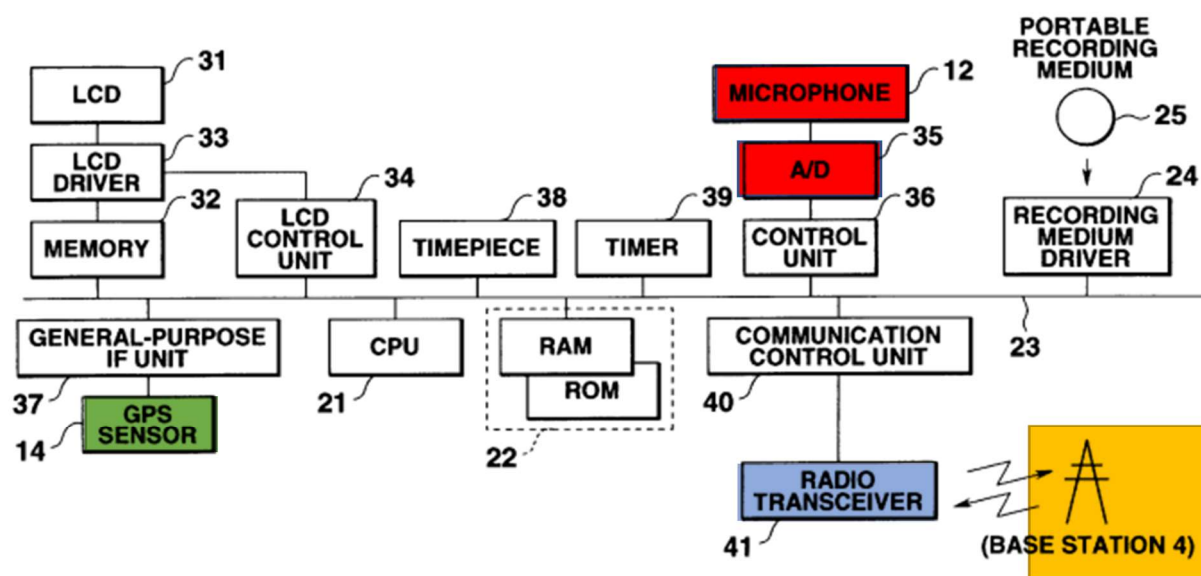
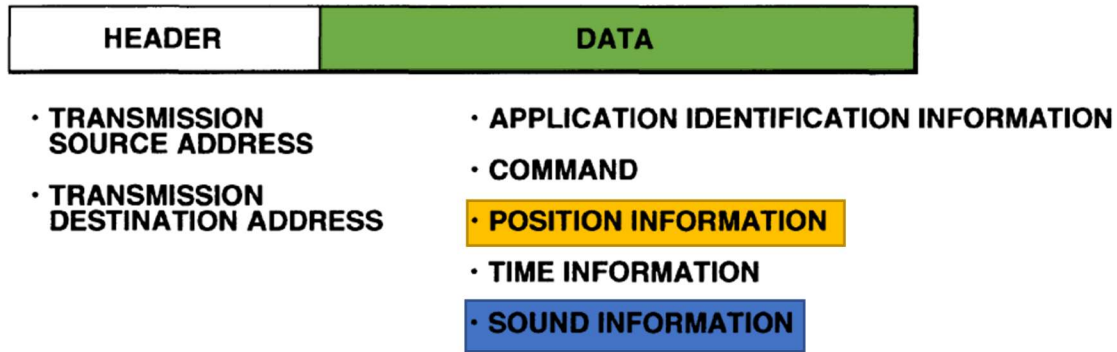


FIG.4



Yamakita, FIGS. 1, 3, 4.

- e. [17d]: “receiving, by the communication device, current position information in response to communicating the plurality of items of information, wherein the current position information comprises data for plotting a course on a map including the current location of the communication device;”

Yamakita discloses [17d] because the portable terminal receives an action record table including current position information and data for plotting a course on a map that includes the current location of the portable terminal in response to transmitting GPS and environmental information. Yamakita, 1:41-48, 6:37-45, 9:46-48, FIGS. 7, 14; Decl. ¶¶ 163-168.

The process corresponding to [17d] can be summarized in three steps: **First**, Yamakita’s host terminal processes the GPS and sound (environmental

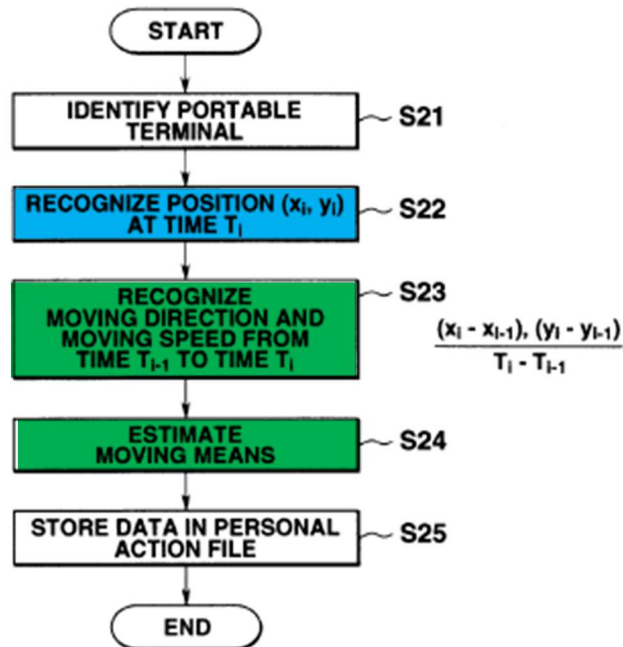
information) received from the portable terminal to determine a location of the portable terminal along a route at a particular time; **then**, Yamakita's host terminal generates an action table (current position information) including the portable terminal's current location (e.g., position (x1, y1) detected at time t1) and subsequent locations (e.g. position (x2, y2) detected at time t2) based on the processed information; **finally**, Yamakita's portable terminal receives a transmission packet containing the generated action table from the host terminal. Yamakita, 5:65-6:9, 6:38-46, 9:46-51, 9:63-10:4. FIGS. 7, 9, 14, 16, 18.

For step 1, “[u]pon receiving the information transferred from the portable terminal,” the host terminal “extract[s]” and processes the GPS and sound (environmental) data from the transmission packet to estimate “the position of the user who is carrying the portable terminal 1 at a certain time point, and if he/she is moving, [and] the [user's] moving means.” Yamakita, 5:65-6:9, 6:37-45, FIGS. 7, 14, 18.

In step 2, Yamakita's host terminal uses the processed GPS and sound information to “analyze the moving route” “of the user who is carrying the portable terminal 1” to compile an “action record table” reflecting the user's current position, route, and mode of transportation, i.e., current position information including data for plotting a course on a map. Yamakita, 1:41-48, 6:37-45, 9:46-48,

FIGS. 7, 14 (action table/current position information). Figure 7, annotated below, illustrates a process for analyzing the GPS and environmental information.

FIG.7



Yamakita, FIG. 7

At [step S22](#) of Figure 7, the host terminal processes the portable terminal's GPS information—the “position information and time information, which are stored in the data portion of the received packet, are extracted to recognize the position (x_i,y_i) of the portable terminal 1 at time T_i.” Yamakita, 5:65-6:1. At steps [S23-24](#) of Figure 7, the host terminal processes the “sound information stored in the data portion of the received packet,” (environmental information) to determine

the portable terminal's "moving means (walking, train, motor vehicle, stop, ...)."

Yamakita, 6:1-14.

Yamakita's host terminal compares the extracted, processed information to the "map data" illustrated in Figure 9 and the local information "data table" illustrated in Figure 16 to generate an action record table (current position information) according to the process of Figure 15. Yamakita, 6:37-45 (explaining that "the host terminal 3 executes the processing of the flow chart shown in FIG. 7 to analyze the moving route of the user who is carrying the portable terminal 1" and "has map data as shown in FIG. 9" and "[f]or the purpose of analyzing the route."), 9:2-48 (explaining that "[t]he table shown in FIG. 16 stores various names on the map and corresponding position information," and the "extracted" position information is "checked" by "refer[ring]" to the table shown in Figure 16), FIGS. 9, 7, 15, 16. Thus, the action table comprises "data" for plotting a course on a map including the current location of the mobile communication device.

FIG.14

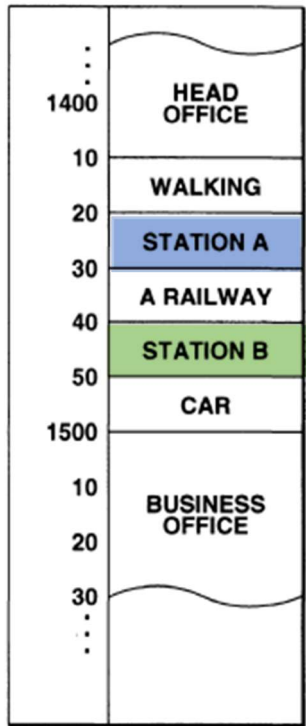


FIG.16

REGISTRATION POSITION	NAME
X ₁₀₁ , Y ₁₀₁	STATION A
X ₁₀₂ , Y ₁₀₂	STATION B
⋮	
X ₅₀₁ , Y ₅₀₁	HEAD OFFICE
X ₅₀₂ , Y ₅₀₂	BUSINESS OFFICE
X ₅₀₃ , Y ₅₀₃	MR. K'S HOME
⋮	

USER REGISTRATION DATA {

Yamakita, FIGS. 14, 16 (illustrating action table and corresponding data).

In step 3, the host terminal transfers the action record table in a data packet to the portable terminal. Yamakita, 9:46-51, 9:63-10:4. When the portable terminal receives the packet, it “extracts the action record table from the packet transferred from the host terminal 3 and displays it on the [portable terminal’s] LCD display unit 11.” Yamakita, 9:46-51, 9:63-10:4, 11:28-31, FIG. 18.

FIG.18



Yamakita, FIG. 18 (illustration displayed on portable terminal LCD).

- f. [17e]: “and displaying, by the communication device, the map based on the current position information.”

As explained for [17d], Yamakita’s portable terminal extracts the received action record table (current position information including data for plotting a course on a map) and displays it as an illustration on its LCD display unit.

Yamakita, 9:63-10:4, 11:28-31, FIG. 18.

FIG.18



Yamakita, FIG. 18 (illustration displayed on LCD).

As explained for Ground 3, a POSITA would have understood that Yamakita’s action record table illustration is a map because it provides visual guidance for directing the user from their current location (station A) to a destination (business office), and the illustration corresponds to “various names on

the map and corresponding position information” and “map data.” Yamakita, 6:37-46, 9:4-6; Decl. ¶¶ 149-151, 170.

To the extent Patent Owner disputes that Yamakita’s table is a map, it would have been obvious to use a map to display navigational guidance, as taught by Chern (**Ground 4**). Decl. ¶¶ 171-175.

Chern discloses a wireless location-based information retrieval system having navigation applications. Chern, Abstract, [0044]. The system includes a wireless handset having a “position determination system” for determining the handset’s location using GPS or “[a]lternative position determination systems,” and an LCD display for displaying “textual driving directions” and “a map showing the route.” Chern, [0035], [0040], [0044]. The system also includes a server that communicates “driving directions to a destination address ... to a handset user” over a wireless network Chern, [0043]-[0044].

Using the handset, a user sends a request for directions to a server (remote source) over a wireless network. Chern, [0044]. At the time of the request, the handset provides its location (determined by the handset’s position determination system) to the server. Chern, [0044]. Then, “[u]sing the handset location and the destination address, server 136 calculates a route and compiles driving directions.” Chern, [0044]. The calculated route and directions include data for plotting a course on a map including the current location of the handset, such that “[i]n

addition to textual driving directions, a map showing the route may be displayed on the handset display.” Chern, [0044]. Chern’s map is displayed on the handset’s LCD to provide visual guidance for reaching the destination to the user. Chern, [0035], [0040].

A POSITA would have been motivated and found it obvious to display a map, as taught by Chern, graphically representing the information in Yamakita’s action record table (information for plotting a course and the current location) to enable the user to visually understand the navigational route from the user’s location to the desired destination. Decl. ¶ 174. Displaying the map would have improved the user’s experience by allowing them to see their current position relative to their destination and intermediate locations and giving them a sense of direction, thereby reducing the likelihood that the user proceeds in the wrong direction. Decl. ¶ 174. And displaying navigation information as a map on a GPS-enabled mobile device, like that of Yamakita, was a common method for displaying navigation guidance to a user and well-known in the art before the ’416 patent. Chern, [0044]; Drury, 2:16-20, 6:1-15; Obradovich, 1:13-26, 25:1-16, FIG. 43; Naito, 2:21-34, 3:39-43.

A POSITA would have had a reasonable expectation of success in displaying the map because doing so would have merely required the use of existing components (Yamakita’s server and display) to perform routine functions

(transmitting a map illustration and displaying the illustration) as was well-known in the art. Yamakita, 9:46-51, 9:63-10:4, 11:28-31; Chern, [0044]; Drury, 2:16-20, 6:1-15; Obradovich, 1:13-26, 25:1-16, FIG. 43; Naito, 2:21-34, 3:39-43; Decl. ¶ 173.

2. Claim 18: “The method of claim 17, wherein the communication device comprises a camera and wherein the environmental information comprises image data captured by the camera.”

As explained for claim [17a], the portable terminal acquires environmental information associated with the current location. Yamakita, FIG. 1, Abstract, 2:54-63, 4:21-34. The environmental information also includes “image information” (image data) captured by the portable terminal’s camera. Yamakita, 4:28-30, 4:32-34, 4:55-56 (“The sound information is sound data acquired through the microphone 12 at the timing when the position information is detected ... However, a ... camera may be arranged to acquire ... image information as ambient information.”); Decl. ¶ 176.

3. Claim 19: “The method of claim 17, wherein the communication device comprises a microphone and wherein the environmental information comprises sound data captured by the microphone.”

As explained for claim 17, the environmental information includes “ambient sound data (e.g., noise) collected through the microphone” of the portable terminal (communication device). Yamakita, 4:28-30, 4:55-56. Thus, Yamakita’s portable

terminal (communication device) includes a microphone 12, and the noise (environmental information includes “ambient sound data” “collected through” (captured by) the microphone. Yamakita, 4:28-30, 4:55-56; Decl. ¶ 177.

IX. Discretionary Denial Is Not Warranted

A. Discretionary Denial is Not Warranted under § 325(d).

None of the references cited herein were before the Office. *See generally* Ex. 1002. Accordingly, Petitioner submits that the first part of the *Advanced Bionics* framework is not satisfied because the Petition includes grounds based on combinations of prior art not previously presented to the Office.

To the extent the Board determines an analysis under part 2 of *Advanced Bionics* is warranted, Petitioner submits that the Grounds asserted herein demonstrate that the Examiner erred in its evaluation of the prior art. Accordingly, Petitioner submits that the evidence and facts presented in the Petition warrant reconsideration of the prior art, and respectfully requests the Board decline exercising its discretion to deny institution under 35 U.S.C. § 325(d).

B. Discretionary Denial Is Not Warranted Under *Fintiv*

Petitioner is plaintiff in the pending case captioned *BMW of North America LLC v. NorthStar Systems LLC*, No. 6:23-cv-00456 (W.D. Tex), and BMW AG, an RPI to this petition, is defendant in the pending case captioned *NorthStar Systems LLC v. Bayerische Motoren Werke AG*, No. 2: 22-cv-00496 (E.D. Tex) (“the pending litigations”).)

Apple Inc. v. Fintiv, Inc., IPR2020-00019, Paper 11, at 5-6 (PTAB Mar. 20, 2020) (precedential), and the Office’s interim guidelines dated June 21, 2022 (“Guidance Memo”) favor institution.

The pending litigations are in their infancy and the parties have not yet requested a stay. Trial in the Eastern District of Texas is currently scheduled for November 18, 2024. A FWD would issue around January 2025, shortly after trial ends. Based on these facts, factors 1, 2, and 5 are, at worst, neutral. Indeed, the Board has instituted under similar fact patterns. *See NetNut Ltd. v. Bright Data Ltd.*, IPR2021-01492, Paper 12 at 9-16 (PTAB Mar. 21, 2022) (instituting IPR without stipulation and copending trial date six months before FWD); *Protect Animals with Satellites v. OnPoint Sys., LLC*, IPR2021-01483, Paper 11 at 11-13, 17 (PTAB Mar. 4, 2022) (same with trial one month before FWD); Guidance Memo, 8-9.

Factor 3 strongly favors institution because Petitioner acted diligently in filing this petition and the parties have not substantially invested in the pending litigation—discovery has not yet begun, invalidity contentions have not been served, and no *Markman* hearing occurred.

Factor 4 likewise favors institution because invalidity contentions have not been served, and no overlapping issues exist. Factual circumstances are expected to change between the filing of this petition and a decision on institution—Petitioner

intends to address these changes, including by providing a *Sand* or *Sotera*-type stipulation, data on times to trial, and the case schedule, at the relevant time.

This Petition presents a compelling case on the merits. If the Board finds that factors 1-5 favor denial of institution, the compelling merits under factor 6 should still result in institution. Guidance Memo 3-4; *CommScope Techs. LLC v. Dali Wireless, Inc.*, IPR2022-01242, Paper 23 at 3 (PTAB Feb. 27, 2023) (precedential).

X. Mandatory Notices

A. Real Parties-in-Interest Under 37 C.F.R. § 42.8(b)(1)

The real parties-in-interest are BMW of North America, LLC and Bayerische Motoren Werke AG.

B. Related Matters Under 37 C.F.R. § 42.8(b)(2)

To the best of Petitioner's knowledge, the '416 patent is/was involved in the following district court litigations:

Name	Number	Court	Filed
<i>BMW of North America, LLC v. NorthStar Systems, LLC</i>	IPR2023-01191	PTAB	August 3, 2023
<i>BMW of North America, LLC v. NorthStar Systems LLC</i>	6:23-cv-00456	WDTX	June 16, 2023
<i>NorthStar Systems LLC v. Bayerische Motoren Werke AG</i>	2:22-cv-00496	EDTX	Dec. 27, 2022
<i>NorthStar Systems LLC v. Hyundai Motor Company et al.</i>	2:22-cv-00495	EDTX	Dec. 23, 2022
<i>NorthStar Systems LLC v. Volkswagen AG</i>	2:22-cv-00486	EDTX	Dec. 22, 2022

<i>NorthStar Systems LLC v. Mercedes-Benz Group AG</i>	2:22-cv-00323	EDTX	Aug. 19, 2022
<i>NorthStar Systems LLC v. Lenovo Group Ltd.</i>	2:22-cv-00267	EDTX	July 18, 2022
<i>NorthStar Systems LLC v. HP Inc.</i>	2:22-cv-00265	EDTX	July 15, 2022
<i>NorthStar Systems LLC v. Honda Motor Company, Ltd.</i>	2:22-cv-00143	EDTX	May 11, 2022
<i>NorthStar Systems LLC v. Broadcom Inc.</i>	2:22-cv-00144	EDTX	May 11, 2022
<i>NorthStar Systems LLC v. Xiaomi Corporation et al.</i>	2:22-cv-00139	EDTX	May 10, 2022
<i>NorthStar Systems LLC v. MediaTek Inc.</i>	2:22-cv-00135	EDTX	May 05, 2022
<i>NorthStar Systems LLC v. TCT Mobile Int'l Ltd.</i>	2:20-cv-00383	EDTX	Dec. 15, 2020
<i>NorthStar Systems LLC v. Kyocera Corp.</i>	2:20-cv-00384	EDTX	Dec. 15, 2020
<i>NorthStar Systems LLC v. Shenzhen OnePlus Science & Tech. Co., Ltd.</i>	2:20-cv-00385	EDTX	Dec. 15, 2020
<i>NorthStar Systems LLC v. ZTE Corp.</i>	2:20-cv-00386	EDTX	Dec. 15, 2020

C. Lead and Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3)

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D. Service Information Under 37 C.F.R. § 42.8(b)(4)

Please address correspondence to lead and back-up counsel at the addresses above and BMW-NorthStar-IPRs@finnegan.com. Petitioner consents to electronic service by e-mail.

XI. Standing

Petitioner certifies that the '416 patent is available for IPR, and Petitioner is not barred or estopped from requesting IPR on the grounds identified in this Petition.

XII. Conclusion

Petitioner has established a reasonable likelihood of prevailing for the challenged claims and requests the Board institute IPR and cancel each challenged claim as unpatentable.

Date: August 3, 2023

Respectfully submitted,

/Lionel M. Lavenue/

Lionel M. Lavenue

Lead Counsel

Reg. No. 46,859

CERTIFICATE OF COMPLIANCE

The undersigned hereby certifies that the foregoing **Petition for *Inter Partes* Review** contains 10,045 words, excluding those portions identified in 37 C.F.R. § 42.24(a), as measured by the word-processing system used to prepare this paper.

/Lionel M. Lavenue/
Lionel M. Lavenue
Lead Counsel
Reg. No. 46,859

CERTIFICATE OF SERVICE

The undersigned certifies that the foregoing **Petition for *Inter Partes* Review** was served on August 3, 2023, by FedEx Priority Overnight at the following address of record for the subject patent. The associated **Exhibits 1001-1006, 1008-1017, 1019-1022** and the **Power of Attorney** were also served on August 3, 2023.

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