

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

ALD SOCIAL LLC,
Patent Owner.

IPR2023-01399
Patent 9,402,158 B2

Before BARBARA A. BENOIT, SHARON FENICK, and
PHILLIP A. BENNETT, *Administrative Patent Judges*.

BENNETT, *Administrative Patent Judge*.

DECISION
Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Apple Inc. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting institution of *inter partes* review of claims 1–16 (“the challenged claims”) of U.S. Patent No. 9,402,158 B2 (Ex. 1001, “the ’158 patent”), supported by the Declaration of Stephen J. Guy (Ex. 1003). ALD Social LLP (“Patent Owner”) has not filed its mandatory notice as required by 37 C.F.R. § 42.8(a)(2), nor has any attorney entered an appearance in this proceeding on Patent Owner’s behalf. As a result, no Patent Owner Preliminary Response has been filed.

The Board’s authority to determine whether to institute an *inter partes* review is under 35 U.S.C. § 314. *See also* 37 C.F.R. § 42.4(a) (2020). To institute an *inter partes* review, the information presented in the Petition must show “a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a).

For the reasons set forth below, the information presented in the Petition establishes a reasonable likelihood that Petitioner will prevail with respect to at least one challenged claim. Accordingly, we institute an *inter partes* review of claims 1–16 of the ’158 patent.

A. Real Parties in Interest

The Petition indicates Apple Inc. is the real party in interest. Pet. 76. As noted above, Patent Owner has not filed its Mandatory Notice. Without further information presented, and based on USPTO assignment records, we identify ALD Social LLC as a real party in interest.

B. Related Matters

As required by 37 C.F.R. § 42.8(b)(2), Petitioner identifies various judicial or administrative matters that would affect or be affected by a decision in this proceeding. Pet. 76. Petitioner identifies the following district court cases: (1) *ALD Social, LLC v. Verkada, Inc.*, 3-23-cv-00049 (N.D. Cal.); (2) *ALD Social LLC v. Verizon Communications Inc.*, 6-22-cv-01011 (W.D. Tex.); (3) *ALD Social LLC v. Apple Inc.*, 6-23-cv-02695 (N.D. Cal.); (4) *ALD Social LLC v. AT&T Inc.*, 6-22-cv-00970 (W.D. Tex.); (5) *ALD Social LLC v. Google LLC*, 6-22-cv-00927 (W.D. Tex.); (6) *ALD Social LLC v. T-Mobile US, Inc.*, 6-22-cv-00973 (W.D. Tex.); (7) *ALD Social, LLC v. Verkada, Inc.*, 6-22-cv-0097 (W.D. Tex.); (8) *ALD Social, LLC v. Alert Media, Inc.*, 6-22-cv-00959 (W.D. Tex.).

Although not identified by Petitioner, we note a concurrently filed petition challenging a different patent: IPR2023–001398 (challenging U.S. Patent No. 9,198,054 B2).

C. The '158 Patent

The '158 patent is titled “Aggregate location dynamometer (ALD).” Ex. 1001, code (54). The patent “relates to cell location services, cell network trafficking and analysis of location information.” *Id.* at 1:19–20. The written description “introduces an Aggregate Location Dynamometer (ALD), an analytical server utilizing location based services (LBS) on a network to predict public safety risks, e.g., the unexpected impending formation of a flash mob, or a riot, etc.” *Id.* at 2:56–60. The ALD “predicts public safety risk in a given geographical area through evaluation of the positioning and movement of wireless devices.” *Id.* at 3:2–4.

In operation, the ALD “monitors wireless device network traffic to predict an impending viral event, [and] [i]f a possible impending viral event is sensed from a general monitoring of wireless traffic, the [ALD] may request impending viral location information pertaining to clusters of wireless devices . . . to more accurately assess crowd risk.” *Id.* at 3:4–11.

Figure 1, reproduced below, illustrates the components of the ALD as well as various connected components:

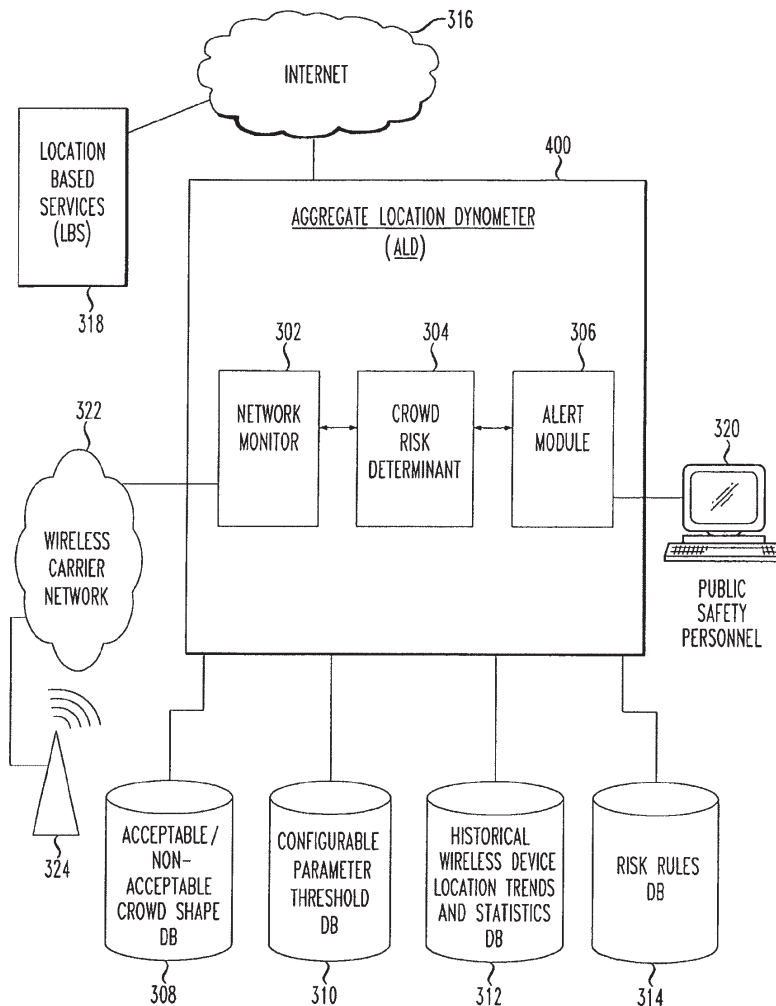


Figure 1 shows the structure of the ALD which includes a Network Monitor 302, a Crowd Risk Determinant 304, and an Alert Module 306. The Network Monitor 302 “begins the process . . . by monitoring the network for indication of a possible viral event.” *Id.* at 3:42–45. The Crowd

Risk Determinant 304 “assesses location information pertaining to a possible viral event triggered by the network monitor . . . [and] determines if a viral event also indicates a public safety risk.” *Id.* at 3:50–52. The Alert Module 306 “performs predetermined responsive measures to alert appropriate public safety personnel 320 in the event of a possible or probable or current public safety risk.” *Id.* at 3:52–56. The ’158 patent description further describes the use of historical databases in crowd risk assessment. The historical databases include “a Historical Wireless Device Location Trends and Statistics database 312, a Configurable Parameter Threshold database 310, a Risk Rules database 314, and an Acceptable/Non-Acceptable Crowd Shape database 308.” *Id.* at 3:63–67.

D. Challenged Claims

All sixteen claims in the ’158 patent are challenged, of which claims 1 and 8 are independent. Illustrative claim 1 follows:

1. An aggregate location dynamometer in a physical wireless network server, said aggregate location dynamometer comprising:

a network monitor to monitor a wireless network for an indication of a potential viral event indicated by an aggregation of current locations of a plurality of physical wireless devices associated with said potential viral event; and

a crowd risk determinant to assess said aggregation of said current locations of said plurality of physical wireless devices pertaining to said potential viral event triggered by said network monitor.

Ex. 1001, 9:18–29 (bracketed annotations added).

E. The Asserted Grounds of Unpatentability

Petitioner challenges the patentability of the challenged claims on the following grounds:

Claims Challenged	35 U.S.C. §	Reference(s)/Basis
1	103 ¹	Wolfe ²
2–3	103	Wolfe and Pfeffer ³
4–7	103	Wolfe, Pfeffer, Hua ⁴
8–16	103	Wolfe, Hua

Pet. 18.

II. ANALYSIS

A. Level of Ordinary Skill in the Art

The level of ordinary skill in the art at the time of the invention is a factual determination that provides a primary guarantee of objectivity in an obviousness analysis. *Al-Site Corp. v. VSI Int’l Inc.*, 174 F.3d 1308, 1324

¹ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. § 103, was effective on March 16, 2013. The ’158 patent claims the benefit of a provisional application filed Mar. 2, 2010 via a series of continuation applications and a PCT application. Petitioner asserts that Mar. 2, 2010 is the “earliest possible priority date.” Pet. 3. Because this date is before the effective date of the applicable AIA amendment, the pre-AIA version of § 103 applies for purposes of institution.

² U.S. Patent Appl. Pub. No. US2011/0040603 A1, published February 17, 2011 (Ex. 1004). Petitioner asserts Wolfe is prior art under 35 U.S.C. § 102(a). *See* Pet. 18.

³ U.S. Patent Appl. Pub. No. US 2009/0284348A1, published November 19, 2009 (Ex. 1005). Petitioner asserts Pfeffer is prior art under 35 U.S.C. § 102(b). *See* Pet. 18.

⁴ U.S. Patent Appl. Pub. No. US 2009/0222388 A1, published September 3, 2009 (Ex. 1006). Petitioner asserts Hua is prior art under 35 U.S.C. § 102(b). *See* Pet. 18.

(Fed. Cir. 1999) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991)).

Petitioner asserts that a person of ordinary skill in the art “would have been someone knowledgeable and familiar with the field of crowd analysis and location-based computing that are pertinent to the ’158 patent” and further “[t]hat person would have at least a bachelor’s degree in computer science/computer engineering, or equivalent training, and approximately two years of experience working in the field of crowd analysis and location-based computing. Lack of work experience can be remedied by additional education, and vice versa.” Pet. 13 (citing Ex. 1003 ¶ 7–9).

Determining the level of ordinary skill in the art involves various factors, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citation omitted). The prior art of record also reflects the level of ordinary skill in the art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

The asserted prior art, like the challenged patent, presents high-level schematics and functional descriptions of various system components used in monitoring events and crowd behavior using location-based services. These system components largely include servers, websites, and mobile telephones utilizing wireless technologies, such as Wi-Fi, cellular, and global positioning system (GPS) to communicate and generate location data regarding mobile devices, as well as the use of databases to store historical information related to location-based services. The prior art and the patent provide description of monitoring crowd behavior by tracking the location of groups of mobile devices. Neither the challenged patent nor the asserted

prior art provides detailed discussion of the particulars of communication protocols, such as cellular, Wi-Fi, or GPS protocols.

For example, Wolfe relates to “a population activity mapping method [that] may include detecting a plurality of wireless mobile devices within a geographic region . . . by use of a wireless access point, a GPS satellite, and/or a base station.” Ex. 1004, code (57). Similarly, Pfeffer describes “receiving incident information corresponding to an incident at an incident location . . . [and] identif[ying] a number of responders for responding . . . based at least in part on past performance of the responder.” Ex. 1005, code (57). Hua also relates to similar subject matter. Specifically, Hua “is directed to a computer automated method of selectively identifying a user specified behavior of a crowd . . . specified by a configurable behavior rule . . . and using textual analysis techniques.” Ex. 1006, code (57).

Accordingly, based on this preliminary record, we accept Petitioner’s proposal regarding the level of skill in the art, and for the purpose of this decision, we find that a person of ordinary skill in the art would have been knowledgeable and familiar with the field of crowd analysis and location-based computing and possess a bachelor’s degree in computer science/computer engineering, or equivalent training, and approximately two years of experience working in the field of crowd analysis and location-based computing. We apply this level of ordinary skill in this preliminary decision.

B. Claim Construction

In *inter partes* reviews, the Board construes claims using the same claim construction standard employed in a civil action under 35 U.S.C. § 282(b). 37 C.F.R. § 42.100(b) (2020). Under the principles set forth by

our reviewing court, the “words of a claim ‘are generally given their ordinary and customary meaning,’” as would have been understood by a person of ordinary skill in the art in question at the time of the invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17). We construe claim terms only as relevant to the parties’ contentions and only to the extent necessary to resolve the issues in dispute. *See Realtime Data LLC v. Iancu*, 912 F.3d at 1375912 F.3d 1368, 1375 (2019) (“The Board is required to construe only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.” (internal quotation omitted)); *see also Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

Petitioner asserts that the phrase “indication of a potential viral event” requires construction. Pet. 14. Petitioner states that “a POSITA (person of ordinary skill in the art) would have understood the phrase[] ‘*indication of a potential viral event*’ . . . to comprise an indication of a crowd’s activity, including the crowd’s size, density, movement or other characteristics.” Pet. 15 (citing Ex. 1001, 5:26–31, 5:45–51; Ex. 1003 ¶¶ 28–33).

Our decision whether to institute *inter partes* review requires us to construe “to monitor a wireless network for an indication of a potential viral event” recited in claim 1. Claims 2–7, which depend directly or indirectly from claim 1, add limitations related to a historical database and do not

present further limitations for the required wireless network monitoring. As such, the claim language itself does not require a particular manner “to monitor a wireless network for an indication of a potential viral event.”

Regarding, “an indication of a potential viral event” recited in claim 1, we agree with Petitioner that “[t]he specification does not provide any explicit definition.” Pet. 14. The written description, however, indicates “[a] viral event is defined as occurring when one or more predefined parameter thresholds have been surpassed, as determined in the exemplary embodiment in the Network Monitor 302.” Ex. 1001, 4:45–48. As Petitioner notes, the written description also provides examples of predefined parameter thresholds used by Network Monitor 302 “to determine if the monitored network indicates that a viral event may be occurring or impending.” Ex. 1001, 5:14–16; Pet. 14 (citing Ex. 1001, 5:16–20).

Examples of predefined parameter thresholds include an excessive number of wireless devices in an area, excessive use of wireless devices in an area, two highly dense clusters of wireless devices converging at a significant rate of speed, and the difference in the number of wireless devices in an area exceeds a threshold over consecutive time periods. Ex. 1001, 5:15–20, 5:31–35, 5:41–42 (“to assess the number . . . of wireless devices”), 5:55–57; *see* Pet. 15 (citing Ex. 1001, 5:31–36, 5:51–57). As such, the written description describes parameter thresholds related to number, use, and movement of wireless devices being used to determine whether a viral event may be occurring.

Although Petitioner cites to written description passages related to parameter thresholds, Petitioner’s proposed construction of “an indication of a potential viral event” and its application of prior art to “a network monitor to monitor a wireless network for an indication of a potential viral event”

does not require a parameter threshold comparison to be used for network monitoring. Pet. 13–14.

We agree, on this preliminary record, with Petitioner’s position that monitoring a wireless network for an indication of a potential viral event need not necessarily include a parameter threshold comparison, which is not recited by claim 1. Notably, too, the claim language requires monitoring for *an indication* of a *potential* viral event, rather than monitoring for a viral event itself, which additionally distances the claim language from the definition of when a viral event is occurring in the written description (Ex. 1001, 4:45–48).

Additionally, the written description indicates that monitoring a wireless network for indication of a potential viral event may involve actions other than by comparing parameter thresholds. For example, the Summary of the Invention indicates “the Network Monitor utilizes location based services (LBS) to monitor the formation of a plurality of wireless devices at a given point in a wireless network, e.g., a given base station (BS)” as a particular way that “[t]he Network Monitor monitors a wireless network for indication of a possible impending viral event.” Ex. 1001, 1:45–51. Also, the written description indicates Network Monitor 302 monitors a wireless network for an indication of a possible viral event by, among other activities, retrieving aggregate location information of wireless devices within a region being monitored (“snapshots”). Ex. 1001, 5:1–5:7. Furthermore, the written description also indicates “[t]he Network Monitor 302 preferably obtains information regarding the number of wireless devices in a geographical area, at a given time, supported by a particular wireless network carrier.” Ex. 1001, 5:9–12.

Based on the claim language “to monitor a wireless network” and the various descriptions of the Network Monitor obtaining information about wireless devices (e.g., Ex. 1001, 1:42–44, 4:58–5:3, 5:4–7), we agree with Petitioner’s position implied by its arguments concerning the prior art (Pet. 26–27) that “to monitor a wireless network” encompasses to obtain information about wireless devices in a geographic area. *In re Katz Interactive Call Processing Patent Litig.*, 639 F.3d 1303, 1324 (Fed. Cir. 2011) (indicating, as a general rule, “there is a strong presumption against a claim construction that excludes a disclosed embodiment”). Additionally, also based on the claim language and written descriptions (including descriptions of parameter thresholds) related to monitoring for an indication of a viral event, we agree with Petitioner’s position (Pet. 14) that “to monitor . . . for an indication of a potential viral event” encompasses monitoring for an indication of a crowd’s activity, including the crowd’s size and movement.⁵

On this preliminary record, however, Petitioner’s proposed construction does not sufficiently address the term “potential” in “indication of a potential viral event,” recited in claim 1. Additionally, we understand Petitioner’s proposed construction to allow for crowd size *and/or* crowd movement as indications of a crowd’s activity.

⁵ Petitioner proposes that “indication of a viral event” comprises an indication of a crowd’s activity, including the crowd’s size, density, movement, and other characteristics. Pet. 14. For purposes of institution, however, determining that the claim term encompasses an indication of a crowd’s activity, including crowd size and/or movement, is sufficient. *See Realtime Data LLC v. Iancu*, 912 F.3d 1368, 1375 (2019) (“The Board is required to construe only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.” (internal quotation omitted)).

For these reasons, we determine, on this preliminary record and for purposes of this Institution Decision, that “to monitor a wireless network for an indication of a potential viral event” encompasses obtaining information about wireless devices in a geographic area indicating potential crowd activity, including crowd size and/or movement.

C. Principles of Law

A patent claim is unpatentable under 35 U.S.C. § 103 “if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains.” 35 U.S.C. § 103 (2011); *accord KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007) (quoting similar language in pre-AIA version of 35 U.S.C. § 103). The question of obviousness involves resolving the basis of underlying factual determinations including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective indicia of nonobviousness when in evidence (none on this preliminary record). *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

D. Obviousness over Wolfe

Petitioner asserts that claim 1 would have been obvious under 35 U.S.C. § 103 based on the teachings of Wolfe. Pet. 18 (listing all asserted grounds).

1. Wolfe's Disclosure

Wolfe is a U.S. Published Patent Application and titled “Telemetry Based Location and Tracking.” Ex. 1004, code (54). Wolfe’s disclosure relates to “[a] population activity mapping method [that] may include detecting a plurality of wireless mobile devices within a geographic region . . . by use of a wireless access point, a GPS satellite, and/or a base station.” *Id.* at code (57). Wolfe receives input data that allows for tracking of the detected mobile devices, and “[a] distance and speed at which the mobile devices travel within the geographic region may be discerned dependent upon the input data.” *Id.* By tracking the movement of the detected mobile devices, “[a] time and/or location at which salable output is to be made available and/or an amount of salable output to be made available may be determined.” *Id.*

Wolfe’s Figure 2 is reproduced below:

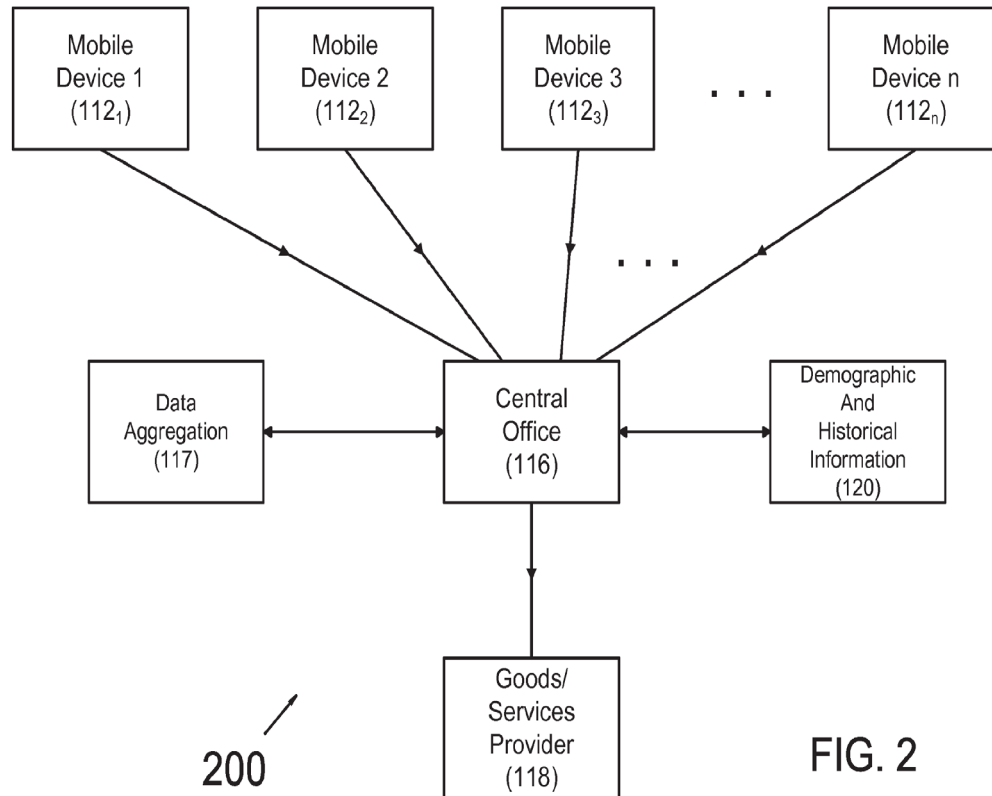


FIG. 2

Wolfe’s Figure 2 depicts “a block diagram of an example telematics-based location and/or tracking arrangement 200 including mobile device 112₁, and central office 116, . . . as well as other mobile devices 112₂, 112₃, . . . 112_n (where n is any number), a goods and/or services provider 118, and a memory device 120 storing demographic and historical information.” *Id.* at ¶ 24. Wolfe describes that each of the mobile devices “may determine its location via communication with GPS satellites and/or cell towers, and then wirelessly transmit its identity and its location to central office 116.” *Id.* Wolfe describes that the central office stores the mobile device locations at more than one point in time in memory device 120, “[f]or example, . . . one to three locations that each mobile device spent the most time at during each day in the past.” *Id.* at ¶ 25. Wolfe further describes that the central office utilizes a data aggregation module 117 to “store and run aggregation

algorithms on the new location data from mobile devices 112 and/or on the . . . historical data from memory device 120.” *Id.* at ¶ 27. The aggregation algorithms may output “a model of the distribution of the locations of the mobile devices 112” and the “model may be used by central office 116 to estimate the size and/or location of crowds including the users of mobile devices 112.” *Id.* The central office, in turn, “may transmit the crowd information, which may include the crowd’s demographics, number of people, locations, and/or patterns of movement, to goods and/or services provider 118 . . . [which] may then estimate the demands of the crowd for the provider’s goods and/or services.” *Id.* at ¶ 28. The estimated demand then may be used so that “provider 118 may prepare to supply a level or number of goods and/or services that corresponds to, or is appropriate for, the anticipated demands of the crowd.” *Id.*

3. Claim 1

We reproduce claim 1 of the ’158 patent with bracketed annotations added:

1. An aggregate location dynamometer in a physical wireless network server, said aggregate location dynamometer comprising:

[1a] a network monitor to monitor a wireless network for an indication of a potential viral event indicated by an aggregation of current locations of a plurality of physical wireless devices associated with said potential viral event; and

[1b] a crowd risk determinant to assess said aggregation of said current locations of said plurality of physical wireless devices pertaining to said potential viral event triggered by said network monitor.

a. Claim 1 Preamble

Claim 1’s preamble recites “[a]n aggregate location dynamometer in a physical wireless network server, said aggregate location dynamometer comprising.” Petitioner relies on Wolfe’s description of “a computing device, such as a ‘server’ for telemetric based location and/or tracking implementations.” Pet. 22 (citing Ex. 1004, ¶¶ 68, 74). Petitioner asserts that the ’158 patent describes an aggregate location dynamometer as an analytical server that predicts public safety risks, and argues that based on that description, “a POSITA would understand that the ‘*aggregate location dynamometer*’ comprises a server having functional hardware or software components.” Pet. 21–22 (citing Ex. 1003, ¶ 50). Petitioner also relies on the combined functionality of the data aggregation module 117, the central office 116, and the demographic and historical information module depicted in Wolfe’s Figure 2. Pet. 23. Petitioner also asserts that Wolfe’s server teaches the recited “physical wireless network server” because Wolfe’s “server can communicate with ‘mobile devices’ using ‘wireless media such as acoustic, radio frequency (RF), infrared (IR) and other wireless media” and “because it is connected in a network environment.” Pet. 24 (citing Ex. 1004, ¶¶ 30, 73).

Regardless of whether the preamble is limiting, Petitioner’s showing for the preamble is sufficient for purposes of institution. As Petitioner notes, the ’158 patent describes the aggregate location dynamometer as “an analytical server utilizing location based services (LBS) on a network to predict public safety risks.” Ex. 1001, 2:56–59.

Wolfe’s Figure 3 depicts a block diagram of a computing device 300 “that is arranged for telemetrics based location and/or tracking implementations.” Ex. 1004, ¶ 68. The computing device includes, *inter*

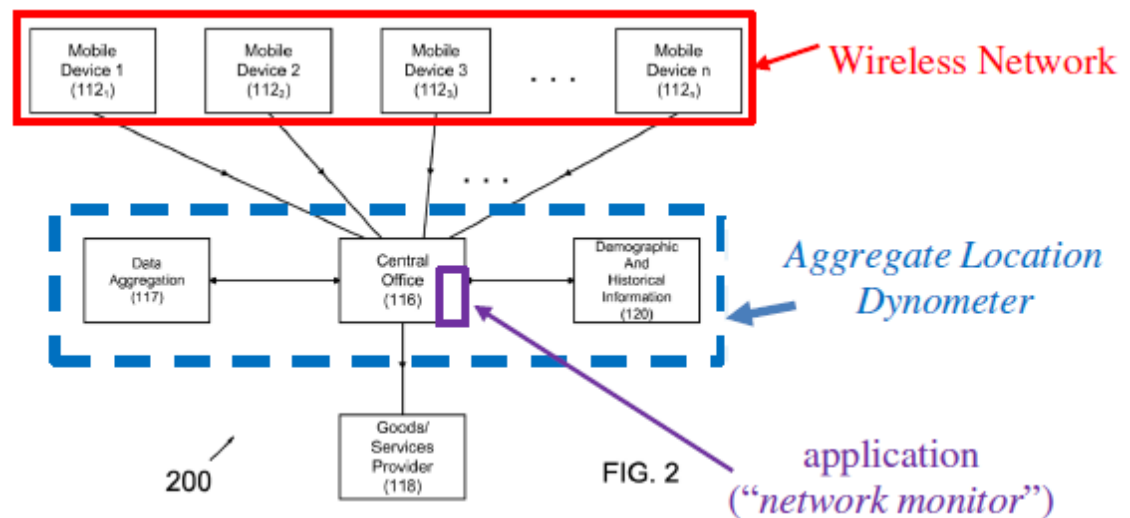
alia, a system memory 320 that “may include an operating system 321, one or more applications 322, and program data 324.” *Id.* at ¶ 70. Wolfe explains that the application 322 “may include a mobile device telemetric data aggregation algorithm 323” as well as program data 324. *Id.* That is, the computing device 300 includes components and modules capable of gathering and aggregating locations of mobile devices and assessing crowd behavior based on those device locations.

We agree with Petitioner that the functionality provided by the applications 322, aggregation algorithm 323, and program data 324 in Wolfe’s computing device 300, and particularly, the functionality provided by the central office 116, the data aggregation module 117, and the demographic and historical data from memory device 120, teaches or suggests the claimed aggregate location dynamometer. Moreover, Wolfe’s computing device 300 is “connected in a networking environment” (¶ 75), the central office 116 of the computing device communicates wirelessly with mobile devices 112 (¶ 30), and “includes a network controller 381, which may be arranged to facilitate communications with one or more of over a network communication via one or more communication ports 382” (¶ 73). We agree with Petitioner that these components in Wolfe teach that the Wolfe’s aggregate location dynamometer is “in a physical wireless network server,” as recited in the preamble of claim 1.

Because we agree with Petitioner that the Wolfe’s network-connected telemetric computing device and its associated components and functions teach “[a]n aggregate location dynamometer in a physical wireless network server,” Petitioner has sufficiently shown at this preliminary stage of the proceeding that Wolfe teaches the preamble of claim 1.

b. Claim 1 Limitation [1a]

The first limitation in the body of claim 1 recites “a network monitor to monitor a wireless network for an indication of a potential viral event indicated by an aggregation of current locations of a plurality of physical wireless devices associated with said potential viral event” (limitation [1a]). For limitation [1a], Petitioner primarily relies on Wolfe’s Figure 2, and Wolfe’s corresponding description that the central office communicates with wireless carriers to receive information regarding phones and/or wireless terminals in specific locations. *See* Pet. 24–25 (citing Ex. 1004, ¶¶ 30, 53, 63). Petitioner provides the following annotated depiction of Wolfe’s Figure 2 to illustrate:



Pet. 26 (depicting Ex. 1004, Figure 2 (annotated)). Petitioner asserts that “a POSITA would understand the functionality of central office 116 (i.e., monitoring the wireless service carriers, access points, and base stations) . . . corresponds to one of the applications/algorithms executing on a server 300” and that this functionality teaches the recited “network monitor to monitor a wireless network.” Pet. 25. Petitioner further relies upon Wolfe’s description of using location information from a mobile device to track

device location and movement of crowds using snapshots of group locations at periodic time intervals, as well as informing a police force of movement and changes in activity levels to teach “for an indication of a potential wireless event.” Pet. 26 (citing Ex. 1004, ¶¶ 10, 11, 14, 20). Relying on its proposed construction of “indication of a potential viral event” as including an “indication of a crowd’s activity, including the crowd’s size, density, movement or other characteristics,” Petitioner asserts that “any of the crowd’s characteristics identified by the system of Wolfe would be an ‘*indication of a potential viral event*’” as claimed. Pet. 27.

Petitioner further relies on Wolfe’s “application 322 of server 300 (performing the functionality of the central office) receiv[ing] location information directly from mobile devices within a geographic area and stor[ing] each mobile device’s location,” to teach “indicated by an aggregation of current locations of a plurality of physical wireless devices.” Pet 27 (citing Ex. 1004, ¶¶ 17, 19, 20, 27).

Finally, Petitioner contends that because Wolfe’s teaches “using the mobile devices’ information to determine the crowd’s motion trends” and also teaches that “crowd data is continuously obtained over time,” Wolfe demonstrates that “each iteration of data collection about the crowd would be obtaining data about devices associated with a viral event” and therefore teaches that the physical wireless devices are “associated with said potential viral event” as recited in claim 1. Pet. 28.

On this preliminary record, Petitioner’s showing is sufficient for purposes of institution. Wolfe describes that one “example embodiment may relate to determining the location of wireless devices (e.g., cell phones).” Ex. 1004, ¶ 10. Wolfe further teaches “providing details of where crwods of people are located, how the crowds are changing, where they are

moving to, when they are transitioning from one activity to another, and/or what activity they may be transitioning to.” *Id.* at ¶ 11. Wolfe notes that “[t]here are many example applications . . . which may enable goods and *services* to be provided in a . . . more responsive fashion by virtue of having determined and/or reported a crowd’s location, pattern of movement, and/or activity level.” *Id.* at ¶ 12 (*italics added*). One example service Wolfe describes is facilitating police service. Specifically, Wolfe teaches that “a police force may be informed of the distribution of people around a city and/or changes in activity levels in specific locations about a city.” *Id.* at ¶ 14. Wolfe teaches that these operations are carried out by the central office 116, depicted in Figure 1. *See, e.g., id.* at ¶ 30 (“In one embodiment, central office 116 may be in communication with only mobile devices 112 that are within the geographic area with which central office 116 is associated.”). The central office 116 can receive location information directly from the devices themselves, or alternatively, the central office can communicate with the network service carrier to receive the mobile device location data. *Id.*

We agree with Petitioner that Wolfe’s central office 116 teaches or suggests “a network monitor to monitor a wireless network” because the central office 116 communicates with the mobile devices on the wireless network, or in the alternative communicates with the wireless network provider, and remains in communication (i.e., monitors) over the wireless network to receive ongoing location data reflecting movement of devices over a period of time. Further, Wolfe explains that “[t]he changing locations of the mobile device users may continue to be monitored.” *Id.* at ¶ 19.

We also agree with Petitioner that the location data of the mobile devices 112 obtained by Wolfe includes “an aggregation of current locations

of a plurality of physical wireless devices.” Wolfe teaches that “[o]nce the individual location data is gathered, aggregation algorithms may be used to create a model of the distribution of the locations of the mobile device users” and that “[t]he changing locations of the mobile device users may continue to be monitored, and the motion of individual terminals may be aggregated to estimate the movement of a crowd or to estimate changes in activity levels.” *Id.* at ¶¶ 18, 19.

Having determined that Wolfe teaches “a network monitor to monitor a wireless network,” and “an aggregation of current locations of a plurality of physical wireless devices,” the question becomes whether Wolfe teaches or suggests that the monitoring of the wireless network by the network monitor is monitoring “for an indication of a potential viral event,” and that the physical wireless devices are “associated with said potential viral event.”

As we determined above, the phrase “to monitor a wireless network for an indication of a potential viral event,” encompasses obtaining information about wireless devices in a geographic area indicating potential crowd activity and/or movement. Under this construction, we agree with Petitioner that Wolfe’s wireless network monitoring is “for an indication of a potential viral event,” as claimed.

As we noted above, Wolfe describes one usage scenario in which based on device locations “a police force may be informed of the distribution of people around a city and/or changes in activity levels in specific locations around the city.” Ex. 1004, ¶ 18. Wolfe explains that “[b]ased on this information, the police force may better position its patrol officers to location around the city where the offices may be needed.” *Id.* In these situations, given that the purpose of the monitoring of device locations is to better position police patrol officers, we agree doing so would be for the

purpose of identifying potential crowd activity and/or movement. Therefore, under our construction of “to monitor a wireless network for an indication of a potential viral event,” we agree with Petitioner that Wolfe’s teaches this limitation. Moreover, because the devices that Wolfe tracks to locations for which police services are needed, Wolfe also teaches that the locations of the plurality of physical devices are “associated with said potential viral event,” as claimed.

Accordingly, Petitioner’s showing as to limitation [1a] is sufficient for institution.

c. Claim Limitation [1b]

Claim 1 further recites “a crowd risk determinant to assess said aggregation of said current locations of said plurality of physical wireless devices pertaining to said potential viral event triggered by said network monitor” (limitation [1b]).

Petitioner again relies on Wolfe. Pet. 28–32. Petitioner argues that “Wolfe discloses ‘*a crowd risk determinant*’ because it teaches application 322 of server 300 determines the ‘size and location of crowds,’ ‘movement of a crowd,’ and ‘level of conviction’ of the crowd.” Pet. 28–29 (citing Ex. 1004, ¶¶ 18–19, 27, 51). Petitioner asserts that the “a POSITA would understand that the functionality described in Wolfe with respect to the central office of Fig. 2 (i.e., using models to estimate the size and location of crowds) corresponds to one of the applications 322 executing on a server 300.” *Id.* at 29. Relying on Wolfe’s police force example, Petitioner contends that “the application 332 of server 300 that performs the crowd analysis functionality (described in relation to the central office) in order to position patrol offices where needed in the city renders obvious a *crowd risk determinant*.” *Id.*

For the recitation that the crowd risk determinant is “to assess said aggregation of said current locations of said plurality of physical wireless devices,” Petitioner relies on Wolfe’s description of the computing device 300 “determin[ing] the ‘size and location of crowds,’ ‘movement of a crowd,’ and ‘level of conviction’ of the crowd.” *Id.* at 29–30 (citing Ex. 1004, ¶¶ 18–19, 27, 51).

Petitioner also contends that Wolfe teaches that the crowd risk determinant “triggered by the network monitor.” *Id.* at 30. Specifically, Petitioner asserts that Wolfe discloses that “one application/algorithm of the central office monitors the wireless carriers and mobile devices (the *network monitor*)” and that “[t]he central office, after obtaining the ‘new location data’ . . . then runs the algorithms on that new data to determine ‘size and location of crowds,’ ‘movement of a crowd,’ and ‘level of conviction’ of the crowd.” *Id.* at 30 (citing Ex. 1004, ¶¶ 18–19, 27, 51).

Petitioner additionally relies on another “example” wherein “Wolfe describes monitoring the number of people in a geographic region, and then, if enough people are within that geographic region, triggering an analysis to determine the likelihood that the crowd of people take action.” Pet. 30. More specifically, Petitioner relies on Wolfe’s description of determining the number of people near a restaurant, and based on the likelihood of each person ordering a slice of pizza, estimating the number of slices needed to accommodate the crowd. *Id.* at 30–31 (citing Ex. 1004, ¶ 46).

Although this Petitioner does not contend this particular example relates to a potential viral event, Petitioner asserts that this example nevertheless renders obvious limitation [1b]. Petitioner explains that in the pizza slice example, “Wolfe teaches that the network monitor functionality determines that there are 10,000 people within a geographic region,” and

when “analysis by the network monitor is completed . . . then the crowd risk determinant of functionality is triggered.” *Id.* at 31 (citing Ex. 1003, ¶ 83). According to Petitioner, this functionality “analyzes the likelihood that the crowd will take a particular action (i.e., determining that the crowd will likely want to purchase 37 slices of pizza within the next 10 minutes),” and that “the ‘crowd risk’ is that it is likely that 37 slices of pizza will be needed.” *Id.* Petitioner asserts that “[p]er Wolfe’s teachings, this crowd risk could just as easily have been likelihood of needing taxis or needing police.” *Id.* Thus, Petitioner posits that because “after obtaining the ‘new location data,’ [the central office] then runs the algorithms on that new data to analyze the characteristics of the crowd and determine the likelihood of the crowd’s activities, it would be obvious . . . that the *network monitor* functionality *triggers* the *crowd risk determinant* functionality.” Pet. 31 (citing Ex. 1003, ¶ 84).

Petitioner’s showing for limitation [1b] is sufficient for purposes of institution. On this preliminary record, Petitioner has sufficiently shown that responsive to the network monitor observing a significant aggregation of devices in a particular area, application 322 functions as a crowd risk determinant because the application 322 assesses the needs arising from the aggregation of devices in that area. Ex. 1004, ¶¶ 46. Additionally, although the example provided in Wolfe relates to determining the number of pizza slices needed based on how many devices are in particular location, on this preliminary record, we agree with Petitioner that a person of ordinary skill in the art would have found it obvious to implement a similar risk analysis to determine that police patrols would be needed in a particular area, as taught by Wolfe, based on the determination of crowd’s location, activity, and movement. *Id.* at 14.

g. Conclusion Regarding Claim 1

As discussed above, Petitioner’s showing regarding the limitations of claim 1 and the reasons a person of ordinary skill in the art, based on teachings and suggestions of Wolfe, would have found it obvious to achieve the invention of claim 1, are sufficient for institution of this proceeding.

Having considered the Petition and prior art evidence cited therein, we determine that Petitioner has established a reasonable likelihood that the teachings of Wolfe renders the subject matter of claim 1 obvious. This showing is sufficient to institute an *inter partes* review on all challenged claims on all asserted grounds in the Petition. *See SAS Inst. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018); 37 C.F.R. § 42.108(a) (“When instituting *inter partes* review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.”).

III. CONCLUSION

For the foregoing reasons, we determine that the information presented in the Petition establishes a reasonable likelihood that Petitioner would prevail in showing at least one of claims 1–16 of the ’158 patent is unpatentable under 35 U.S.C. § 103. We, therefore, institute an *inter partes* review of all challenged claims on all asserted grounds. 37 C.F.R. § 42.108(a); *see SAS Inst.*, 138 S. Ct. at 1359–60.

As 37 C.F.R. § 42.4(c)(1) provides, notice of institution of trial is being sent to the attorneys of record⁶ for the challenged patent as well as the corporate address⁷ and the registered agent⁸ for ALD Social LLC.

IV. ORDER

Accordingly, it is

ORDERED that pursuant to 35 U.S.C. § 314(a), an *inter partes* review is hereby instituted as to claims 1–16 of the '158 patent on all the grounds set forth in the Petition; and,

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial will commence on the entry date of this decision.

⁶ United States Patent and Trademark Office (USPTO) records indicate that nine attorneys associated with Customer Number 116950 are attorneys of record for the two challenged patents. According to USPTO records, Customer Number 116950 is associated with Tarolli, Sundheim, Covell & Tummino LLP in Cleveland, Ohio.

⁷ According to the assignment document recorded at Reel 060788 / Frame 0636, ALD Social LLC is located at 220 Hunting Hill Lane, West Chester, Pennsylvania 19382.

⁸ A Registered Agent, Inc., 8 The Green, Suite A, Dover, Delaware 19901.

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