UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner

IPR2025-01262
U.S. Patent No. 9,485,621

PETITION FOR *INTER PARTES* REVIEW UNDER 35 U.S.C. § 312 AND 37 C.F.R. § 42.104

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CLAIM LISTING

Claim 1	
[1.0]	A method associated with a provider of presence related services
[1.1]	in connection with the use of a mobile station that is operable within a mobile telephone network, and at least a first radio communication defining device that transmits a first distinctive defining signal, the first distinctive defining signal at least partly defines a special area by its coverage, the provider of presence related services having one or more servers, the method comprising:
[1.2]	electronically storing in the one or more servers of the provider of presence related services data capable of linking the mobile station to the special area, the data including a checking data of the first radio communication defining device and an identifier related to the mobile station,
[1.3]	the provider of presence related services being different than the mobile telephone network,
[1.4]	receiving in the one or more servers of the provider of presence related services from the mobile station via the mobile telephone network an updating signal uncorrelated to any mobile station phone call establishment that identifies the mobile station's presence in the special area,
[1.5]	the one or more servers of the provider of presence related services deriving from the updating signal by one or more processing devices having access to at least a portion of the data whether or not the mobile station is present in the special area; and
[1.6]	enabling or disabling by use of the one or more processing devices a presence related service based upon the mobile station's presence or non-presence in the special area.
Claim 2	
[2.0]	The method according to claim 1, wherein the one or more processing devices has access to at least a portion of the data and updates at least one operating parameter in a database of the provider of presence related services depending on the presence of the mobile station in the special area.

Claim 3	
[3.0]	The method according to claim 2, wherein the operating parameter is a tariff flag or a service flag that enables or disables a special tariff or a service for the mobile station.
Claim 4	
[4.0]	The method according to claim 1, wherein the enabling or disabling of the presence related service includes transmitting via the mobile telephone network a signal to the mobile station that is capable of being used to enable or disable one or more related functions in the mobile station.
Claim 5	
[5.0]	The method according to claim 1, wherein the storing of the checking data in the one or more servers of the provider of presence related services comprises electronically receiving from the mobile station the checking data.
Claim 6	
[6.0]	The method according to claim 1, wherein the mobile telephone network is cellular.
Claim 7	
[7.0]	The method according to claim 1, wherein the updating signal comprises the result of a previous determination performed by the mobile station about the mobile station's presence in the special area.
Claim 8	
[8.0]	The method according to claim 1, wherein the updating signal is received in the one or more servers of the provider of presence related services via the mobile telephone network from the mobile station at least one of (i) periodically, (ii) at times recent to when the mobile station enters into or exits from the special area, and (iii) when the mobile station remains in the special area.
Claim 9	
[9.0]	The method according to claim 1, wherein the updating signal comprises a request to access to a multimedia content and the provider of presence related services enables or disables the provision of the

	multimedia content depending on the presence of the mobile station in the special area.
Claim 10	
[10.0]	A method associated with a provider of presence related services in connection with the use of a mobile station that is operable within a mobile telephone network, and at least a first radio communication defining device that transmits a first distinctive defining signal, the first distinctive defining signal at least partly defines a special area by its coverage, the provider of presence related services having one or more servers, the method comprising:
[10.1]	electronically storing in the one or more servers of the provider of presence related services data capable of linking the mobile station to the special area, the data including a checking data of the first radio communication defining device and an identifier related to the mobile station, the provider of presence related services being different than the mobile telephone network,
[10.2]	transmitting to the mobile station from the one or more servers at least a portion of the checking data,
[10.3]	receiving in the one or more servers from the mobile station via the mobile telephone network an updating signal uncorrelated to any mobile station phone call establishment that identifies the mobile station's presence in the special area, the updating signal including the identifier or other identifier related to the mobile station,
[10.4]	the one or more servers deriving from the updating signal by one or more processing devices having access to at least a portion of the data whether or not the mobile station is present in the special area; and
[10.5]	enabling or disabling by use of the one or more processing devices a presence related service based upon the mobile station's presence or non-presence in the special area.
Claim 11	
[11.0]	The method according to claim 10, wherein the one or more processing devices has access to at least a portion of the data and updates at least one operating parameter in a database of the provider of presence related services depending on the presence of the mobile station in the special area.

Claim 12	
[12.0]	The method according to claim 11, wherein the operating parameter is a tariff flag or a service flag that enables or disables a special tariff or a service for the mobile station.
Claim 13	
[13.0]	The method according to claim 10, wherein the enabling or disabling of the presence related service includes transmitting via the mobile telephone network a signal to the mobile station that is capable of being used to enable or disable one or more related functions in the mobile station.
Claim 14	
[14.0]	The method according to claim 10, wherein the storing of the checking data in the one or more servers of the provider of presence related services comprises electronically receiving from the mobile station the checking data.
Claim 15	
[15.0]	The method according to claim 10, wherein the mobile telephone network is cellular.
Claim 16	
[16.0]	The method according to claim 10, wherein the updating signal comprises the result of a previous determination performed by the mobile station about the mobile station's presence in the special area.
Claim 17	
[17.0]	The method according to claim 10, wherein the updating signal is received in the one or more servers of the provider of presence related services via the mobile telephone network from the mobile station at least one of (i) periodically, (ii) at times recent to when the mobile station enters into or exits from the special area, and (iii) when the mobile station remains in the special area.
Claim 18	
[18.0]	The method according to claim 10, wherein the updating signal comprises a request to access to a multimedia content and the provider of presence related services enables or disables the provision of the

	multimedia content depending on the presence of the mobile station in the special area.

I. INTRODUCTION

U.S. Patent 9,485,621 (the "'621 patent," Ex.1001) relates to monitoring the presence of mobile devices (*e.g.*, cellular phones) in particular areas. But functionality to monitor the location of mobile devices, and thus their presence in particular areas, was well known and even standardized—under the umbrella term "location services"—prior to the '621 patent. Similarly, systems for determining device presence based on wireless beacons utilizing short-range wireless communications (*e.g.*, Bluetooth) were also well known prior to the '621 patent. There is nothing new or novel about the '621 patent.

Accordingly, pursuant to 35 U.S.C. §§311, 314(a), and 37 C.F.R. §42.100, Apple Inc. ("Petitioner") respectfully requests that the Board review and cancel as unpatentable under 35 U.S.C. §103 claims 1-18 (the "Challenged Claims") of the '621 patent.

II. GROUNDS FOR STANDING

Petitioner certifies the '621 patent is eligible for IPR and Petitioner is not barred or estopped from requesting IPR challenging the patent claims. 37 C.F.R. §42.104(a).

III. NOTE

Petitioner cites to exhibits' original page numbers. **Emphasis** in quoted material has been added. Claim terms are presented in *italics*.

IV. TECHNICAL BACKGROUND

As explained by Dr. Buehrer in his declaration in more detail, in cellular networks, the location of a mobile device may be estimated based on its interaction with the network's base stations (e.g., cell towers in a cellular telephone network). TS23.171 standard (Ex.1018), 7; *see* Ex.1003 ¶¶29-30. For example, each base station generally broadcasts a signal used by mobile devices to detect nearby base stations. Ex.1005, 5:65-6:3. The signal includes a unique identifier for the particular base station to allow mobile devices to identify that base station. Ex.1005, 5:65-6:3. Because the location of each base station in a cellular network is generally fixed, the mobile device's location may be estimated based on the set of base stations from which it is currently receiving these broadcast signals. Ex.1005, 4:60-5:8; Ex.1006 ¶¶56, 60.

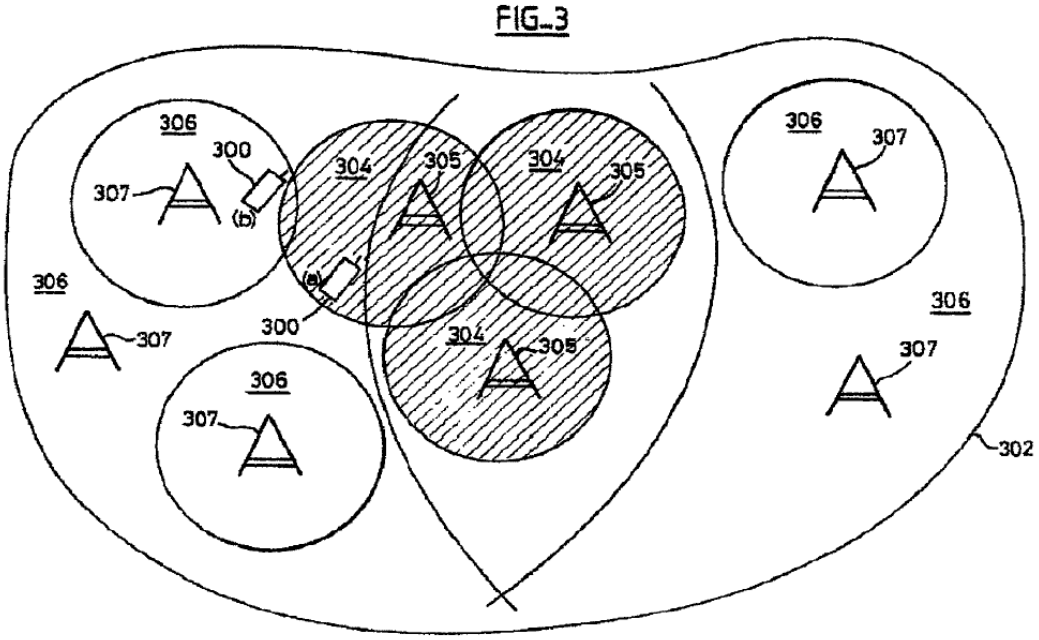
These techniques, referred to as "location services," were well known as early as the 1990s. In fact, by 1999, the 3rd Generation Partnership Project (3GPP), a standards organization for mobile telecommunications, issued multiple technical specifications standardizing aspects of location services. *See* Ex.1019 (3GPP specification for "location services in UMTS," dated October 1999); Ex.1021 (3GPP specification for a system for "coding of locations," dated May 1999). As described herein, the '621 patent simply rehashes "location services" techniques that were well known—and some that were even standardized—well before its

earliest possible priority date (March 28, 2006). Ex.1003 ¶¶29-30.

V. SUMMARY OF THE '621 PATENT

The '621 patent is generally directed to techniques for "monitoring the presence of a mobile station in at least one special area," which the patent describes simply as a particular physical area in which the mobile station's presence is configured to be monitored. Ex.1001, Abstract. The patent describes that a mobile station may receive "defining signals" from "radio communication defining devices" such as "the base stations of a mobile telephone network[.]" Ex.1001, 15:27-32. The defining signal includes, for example, an identifier of the particular base station that enables a determination whether the mobile station is present in a "special area" configured by the operator of the network (*e.g.*, an area including the coverage area of a particular set of base stations). Ex.1001, 15:59-16:3. In response to receiving the defining signal, "the mobile station sends an updating signal to the mobile telephone network." Ex.1001, 16:14-16. Based on this updating signal, components in the mobile telephone network (*e.g.*, a server) can determine the approximate location of the mobile station (*e.g.*, based on the known location of the base station) and whether the mobile station is present in the configured special area (*e.g.*, based on whether the base station is included in the special area). Ex.1001, 16:14-16:59.

FIG. 3 of the ’621 patent illustrates a special area (304) comprising the coverage areas of three base stations (305), and a mobile station (300) present in the special area (304):



’621 patent, FIG. 3

VI. PROSECUTION HISTORY

The ’621 patent issued following submission of a terminal disclaimer to overcome a double patenting rejection over U.S. Patent Application No. 14/561,426 (issued as U.S. Patent No. 9,119,030) and U.S. Patent No. 8,934,922 (both of which the ’621 patent is a continuation of) and claim amendments to overcome rejections under §§102 and 112. The examiner found, based on the claim amendments and applicant arguments, that “the prior art doesn’t teach or suggest

that the provider of the presence related services found in the claims is a provider not related to the mobile telephone network and that the servers performing the steps of the claims are those belonging to only the provider" (limitation [1.3] below). Ex.1002, 16.

VII. EFFECTIVE PRIORITY DATE OF THE '621 PATENT

The '621 patent claims foreign priority, through a chain of continuations, to a European patent application filed March 28, 2006. All references relied on in the Grounds of this Petition qualify as prior art as of this earliest possible priority date, and thus the present Petition does not challenge the propriety of this priority claim. Petitioner does not concede that the '621 patent is entitled to its claimed priority, and reserves the right to challenge its priority claim in this and all other proceedings.

VIII. LEVEL OF ORDINARY SKILL IN THE ART

A person of ordinary skill in the art ("POSITA") as of the earliest possible priority date of the '621 patent (March 28, 2006) would have had a bachelor's degree in electrical engineering, computer science, computer engineering, or a related field, and two years of professional experience relating to research, design, and development of wireless communications networks. Lack of professional experience may be remedied by additional education, and vice versa. Ex.1003 ¶24.

IX. CLAIM CONSTRUCTION

Claim terms in IPRs are construed according to their "ordinary and customary meaning" to those of skill in the art. 37 C.F.R. §42.100(b). For purposes of this proceeding, Petitioner submits that no claim term requires express construction. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

X. RELIEF REQUESTED AND THE REASONS FOR THE REQUESTED RELIEF

Petitioner asks that the Board institute a trial for *inter partes* review and cancel the Challenged Claims in view of the analysis below.

XI. IDENTIFICATION OF HOW THE CLAIMS ARE UNPATENTABLE

A. Challenged claims

Petitioner challenges all claims of the '621 patent (1-18), of which claims 1-6, 8, 10-15, and 17 are asserted in the co-pending litigation.

B. Statutory grounds for challenges

Grounds	Claims	Basis (pre-AIA §103)
1	1, 4-10, 13-18	Putkiranta and Kraufvelin
2	2-3, 11-12	Putkiranta, Kraufvelin, and Granberg
3	1, 4-10, 13-18	Rachabathuni
4	2-3, 11-12	Rachabathuni and Granberg

U.S. Patent 8,615,256 (Ex.1005, "**Putkiranta**"), filed October 17, 2000 and issued December 24, 2013, is prior art at least under §102(e).

U.S. Publication 2006/0135174 (Ex.1006, "**Kraufvelin**") was filed as PCT Application PCT/EP2007/052939 on October 3, 2003, in the English language, designating the U.S., and was published June 22, 2006, and is prior art at least under §102(e).

U.S. Patent 6,122,510 (Ex.1037, "**Granberg**"), filed November 4, 1997 and issued September 19, 2000, is prior art at least under §§102(a), (b), and (e).

U.S. Patent 6,628,938 (Ex.1011, "**Rachabathuni**"), filed August 14, 2000 and issued September 30, 2003, is prior art at least under §§102(a), (b), and (e).

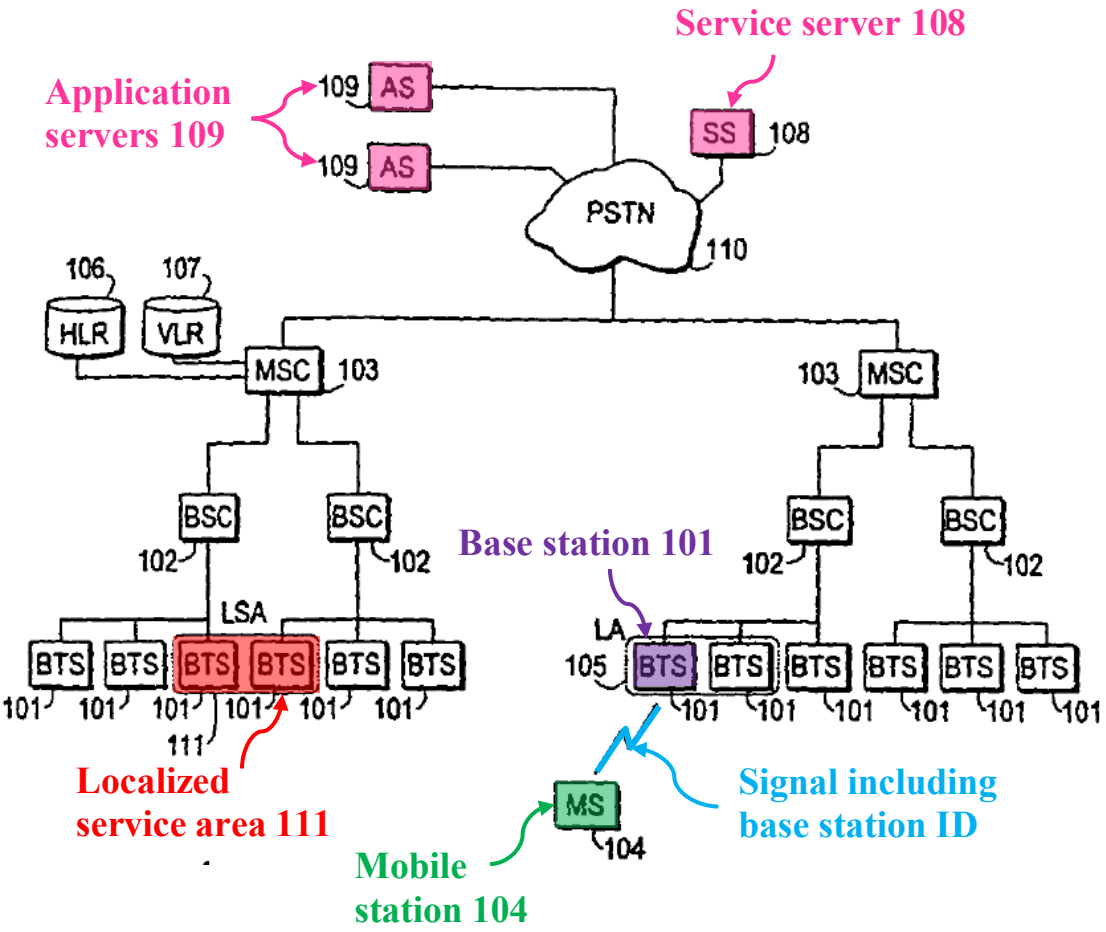
Petitioner also cites to additional references as evidence of the background knowledge of a POSITA and to provide contemporaneous context to support Petitioner's assertions regarding what a POSITA would have understood from the prior art in the grounds. *See Yeda Research v. Mylan Pharm. Inc.*, 906 F.3d 1031, 1041-1042 (Fed. Cir. 2018) (affirming the use of "supporting evidence relied upon to support the challenge"); 37 C.F.R. § 42.104(b); *see also K/S HIMPP v. Hear-Wear Techs., LLC*, 751 F.3d 1362, 1365-66 (Fed. Cir. 2014).

C. Ground 1: Claims 1, 4-10, and 13-18 are obvious over Putkiranta and Kraufvelin

1. Putkiranta

Putkiranta describes "a method and system for making services provided by a network available to the user in various ways depending on the location of the user[.]" Ex.1005, 2:9-12. Putkiranta's FIG. 1 below shows a "cellular radio

system" used to practice the method:

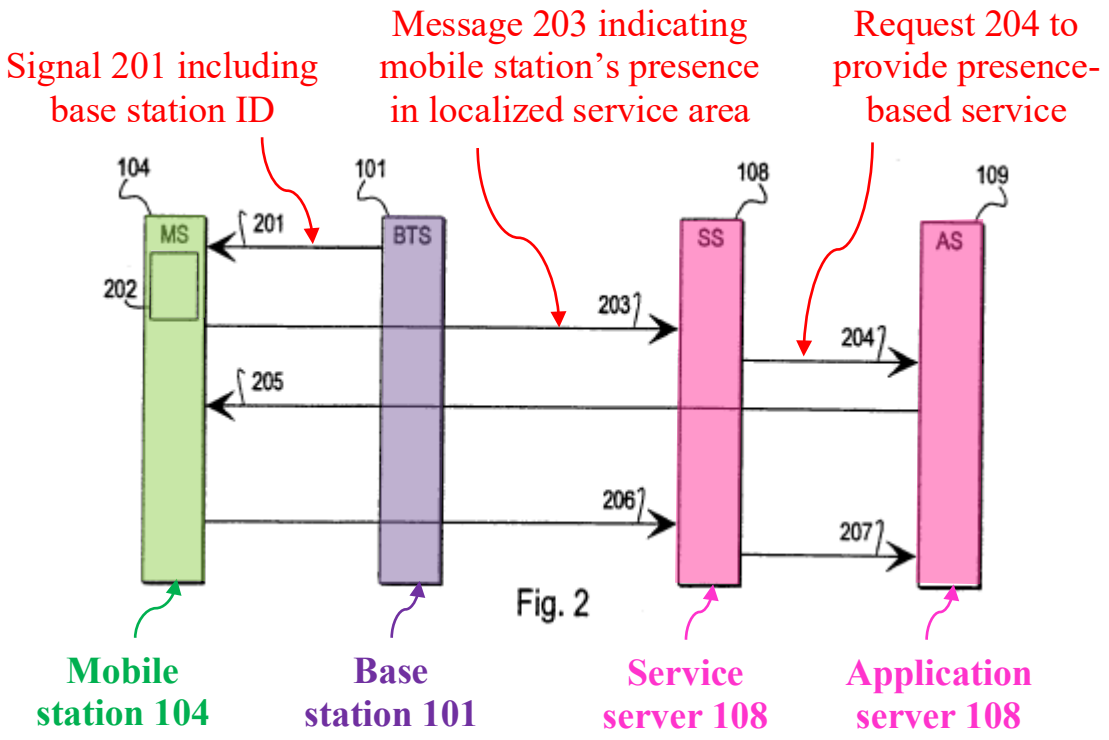


Ex.1005, Detail of FIG. 1 (annotated)

Putkiranta describes a "localized service area" (*e.g.*, 111) as a geographic area in which certain services may be provided to mobile stations (MS) 104 currently located in that area. Ex.1005, 3:8-15. The localized service area may be defined as the geographic area covered by a set of base stations (BTS) 101 (*e.g.*, a set of "cells"). Ex.1005, 4:35-51.

As shown in Putkiranta's FIG. 2 below, when a mobile station receives a

signal (201) from a base station including its base station identifier (indicating the mobile station is located within the base station's coverage area), the mobile station determines (202), based on stored "list of the identifiers of the base transceiver stations the cells of which make a particular localized service area," whether the base station is part of a localized service area. Ex.1005, 5:3-8, 6:3-6. If so, the mobile station sends a message (203) to the service server (108 in FIG. 1 above) indicating that it has "arrived in a certain localized service area." Ex.1005, 6:3-12. Upon receipt of this message, "the service server reads from its memory which services should be offered to the mobile station in that localized service area and sends a service request 204 to the appropriate application server" (AS 109 in FIG. 1 above). Ex.1005, 6:27-30. In response to the service request, at 205, "the application server provides the mobile station with a service," such as, for example, "call pricing or prioritization," "routing of incoming email messages to a mobile station instead of the user's desktop workstation," or "activation or inactivation of automatic call transfer and/or voice mail service." Ex.1005, 6:38-52. Putkiranta's FIG. 2 shows this process:



Ex.1005, Fig. 2 (annotated)

2. Kraufvelin

Kraufvelin describes a method and system similar to Putkiranta's, in which a mobile station notifies the network when it is within the coverage area of a base station (*e.g.*, when the mobile station receives a signal including the base station's identifier) included within an "area of interest" (similar to Putkiranta's "localized service area"). Ex.1006, Abstract, ¶60. Kraufvelin describes the network performing a "verification" or "sanity check" of the notification from the mobile station to verify that the "cell-ID" (identifier of the base station) in the notification is still configured to be within the "area of interest." Ex.1006 ¶107-109. Kraufvelin

teaches that this "sanity check" ensures that changes to the list of base stations included in an "area of interest" that have not been synchronized from the network to the mobile station do not lead to erroneous determinations of mobile station presence. Ex.1006 ¶¶107-109. Kraufvelin explains that, because "operators tune their networks," "a cell-ID may no longer correspond with the intended geographic area" set by the service provider. Ex.1006 ¶108. Thus, Kraufvelin describes verifying the cell-ID returned by the mobile station "to ensure that the cell is still within the intended geographical area…by comparing the current cell-IDs of the intended geographical area stored in the network with the cell-ID returned response from the terminal." Ex.1006 ¶109. If the cell-ID does not match the intended geographical area, then "updated cell-ID information may be provided to the [mobile] terminal." Ex.1006 ¶111; Ex.1003 ¶¶40-41.

3. Reasons to combine Putkiranta and Kraufvelin

A POSITA would have found it obvious to combine the teachings of Putkiranta and Kraufvelin. Ex.1003 ¶¶42-44. In the combination, Putkiranta's service server 108 implements functionality based on Kraufvelin's location "sanity check" feature by deriving from the location notification received from the mobile station whether or not the mobile station is present in the localized service area by "comparing the current cell-IDs of the" localized service area "stored in the network with the cell-ID returned" by the mobile station in the location

notification. Ex.1006 ¶109; Ex.1005, 6:26-29, 9:2-8; Ex.1003 ¶42.

Further, in the combination, Putkiranta's service server 108 implements functionality based on Kraufvelin's cell-ID verification feature, and ensures that when an issue is detected using Kraufvelin's location "sanity check" feature, "updated cell-ID information may be provided to the [mobile] terminal." Ex.1006 ¶111; Ex.1003 ¶43.

a) Putkiranta and Kraufvelin are analogous art

Putkiranta and Kraufvelin are analogous art to the '621 patent because both references are in the same field of endeavor as the '621 patent. *See In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004). The '621 patent relates to monitoring the presence of a mobile station in particular geographic areas. Ex.1001, Abstract. Putkiranta and Kraufvelin are similarly directed to monitoring the presence of a mobile station in particular geographic areas. Ex.1005, Abstract, 4:35-38, 6:22-25 (describing a method for "maintain[ing] information about which mobile stations are in which localized service areas"); Ex.1006, Abstract (describing a method for "[m]onitoring…the presence status of the mobile station relative to said area of interest"); Ex.1003 ¶45.

Putkiranta and Kraufvelin are also analogous art to the '621 patent because they are reasonably pertinent to a problem the '621 patent attempted to solve: the lack of a way to "associate[e] new special areas" with a mobile device "without

modifying any radio transmitting device." Ex.1001, 2:6-20; *See In re Bigio*, 381 F.3d at 1325. Putkiranta and Kraufvelin both describe mechanisms for configuring location monitoring of mobile devices without modifying the configuration of the cellular base stations in the network. *See, e.g.*, Ex.1005, 2:54-65 (localized service areas defined as lists of cell-ids stored at the mobile station); Ex.1006 ¶113 (same); Ex.1003 ¶46.

Thus, Putkiranta and Kraufvelin are analogous art to the '621 patent. Ex.1003 ¶47.

b) A POSITA would have found it obvious to combine Putkiranta and Kraufvelin

A POSITA would have been motivated to combine the teachings of Putkiranta and Kraufvelin to implement functionality based on Kraufvelin's location "sanity check" feature in Putkiranta's service server in the manner described above to, for example, ensure that the mobile station's reported location is accurate, and that the system delivers the appropriate presence related services to the mobile station. Ex.1003 ¶48.

Kraufvelin teaches—and Putkiranta confirms—that "operators tune" (*e.g.*, reconfigure) "their networks on a daily basis," such as by changing the particular cells that makeup a localized service area. Ex.1006 ¶108; Ex.1005, 5:15-17 ("establishing a new base station in the area"); Ex.1003 ¶49. When each localized service area is defined by a list of cells (*i.e.*, base stations), as it is in Putkiranta and

Kraufvelin's systems, the definition of each localized service area must be synchronized between the network and each mobile station. Ex.1006 ¶108; Ex.1005, 5:1-8; Ex.1003 ¶49. Kraufvelin teaches that, due to this need for synchronization, "a cell-ID" reported by a mobile station "may no longer correspond with the" localized service area "due to operator changes to the radio network[.]" Ex.1006 ¶108. To mitigate this issue, Kraufvelin provides its "sanity check" procedure for the network to confirm that the mobile station "is actually in the" localized service area it reported by checking the reported cell-ID against its stored definition of that localized service area. Ex.1006 ¶¶108-109; Ex.1003 ¶49.

A POSITA thus would have been motivated to combine the teachings of Putkiranta and Kraufvelin to implement functionality based on the location "sanity check" feature of Kraufvelin with the service server of Putkiranta to ensure that the mobile station's reported location is accurate (*i.e.*, to confirm that the mobile station "is actually in the" localized service area). Ex.1006 ¶¶108-109; Ex.1003 ¶50. A POSITA would have recognized that this verification would improve the performance of Putkiranta's system by ensuring that the system delivers the appropriate presence related services to the mobile station based on its true location, rather than delivering services configured for a particular localized service area to a mobile station located outside that area. Ex.1006 ¶¶107-109. A POSITA would have been motivated to combine Putkiranta and Kraufvelin in the

proposed manner to achieve at least this benefit. Ex.1003 ¶50.

In addition, this modification to Putkiranta represents a simple combination of prior art elements (Putkiranta's service server with Kraufvelin's location "sanity check" feature), according to known methods to yield predictable results (Putkiranta's service server ensuring that the mobile station location information reflects the current network configuration, as taught by Kraufvelin). *See KSR Int'l v. Teleflex Inc.*, 550 U.S. 398, 416 (2007); Ex.1003 ¶51.

Further, a POSITA would have been motivated to implement functionality based on the location "sanity check" feature of Kraufvelin in the service server of Putkiranta to achieve the same benefits and improve Putkiranta's system "in the same way" as the similar system of Kraufvelin. *KSR*, 550 U.S. at 417 (finding obviousness when a known technique "would improve similar devices in the same way"); Ex.1003 ¶52.

A POSITA would have had a reasonable expectation of success in making such a combination because Kraufvelin teaches a system operating in the proposed manner. Ex.1006 ¶¶107-109; Ex.1003 ¶53. Indeed, the combination is nothing more than "the predictable use of prior art elements according to their established functions." *KSR*, 550 U.S. at 417.

A POSITA would have been further motivated to implement a process, based on Kraufvelin's teachings, by which Putkiranta's service server updates the

cell identifiers stored in the mobile station. Ex.1003 ¶54. Doing so would ensure that each mobile station has an up-to-date and accurate list of cell identifiers to compare against, even as the network changes, thereby ensuring that location-based services remain reliable and accurate. Ex.1003 ¶54.

Putkiranta teaches storing a list of "base station specific identifiers…in the mobile station." Ex.1005, 5:1-8. Putkiranta explains that, in some cases, when the network changes the base station identifiers associated with a particular area (*e.g.*, by adding more base stations in that area), an updated list of identifiers is sent to the mobile station to accommodate for the network changes. Ex.1005, 5:14-22; Ex.1003 ¶55. Putkiranta describes this process at a high level because the implementation details were well known to POSITAs and described extensively elsewhere in the prior art.

For example, Kraufvelin describes a process of sending updated lists of base station identifiers from the source (*e.g.*, Putkiranta's service server) to every impacted mobile station. Ex.1006 ¶¶110-115; Ex.1003 ¶56. Kraufvelin describes a system for providing location services to mobile stations in which the system sends updated lists of cell IDs to affected mobile stations for storage in each mobile station's memory. Ex.1006 ¶¶46, 54-61, 108-111. Kraufvelin's teachings provide a straightforward way to accomplish cell identifier updates, consistent with Putkiranta's "simplest case" where cell identifiers making up localized service

areas are stored in the mobile station's memory. Ex.1006 ¶¶108-111; Ex.1005, 5:3-6; Ex.1003 ¶56. Thus, a POSITA would have been motivated to implement the cell identifier update process in Putkiranta's service server based on the implementation details described in Kraufvelin for its similar process to ensure that each mobile station has an up-to-date and accurate list of cell identifiers to compare against, even as the network changes, thereby ensuring that location-based services remain reliable and accurate. See Ex.1006 ¶¶108-111; Ex.1003 ¶56.

A POSITA would have expected success in implementing Kraufvelin's "cell-id update" teachings with Putkiranta's service server, because Kraufvelin and Putkiranta are both directed towards maintaining cell identifiers that define special geographic areas and providing services therewith. Ex.1003 ¶57. Kraufvelin's teachings are compatible with Putkiranta's system teachings. For example, Putkiranta discloses that the mobile station and the service server communicate with each other via a network. Ex.1005, 4:13-34, 6:6-21, 7:17-20. Similarly, Kraufvelin teaches network elements (e.g., LCS node 12, GMLC 8) communicating location information with a mobile station. Ex.1006 ¶¶60, 107-109.

Moreover, Kraufvelin contemplates that "the elements of the location service functionality may be implemented **anywhere** in the telecommunications system," and generally "in any appropriate entity." Ex.1006 ¶46; *see also* ¶¶58-59.

Thus, a POSITA would have expected success when implementing Kraufvelin's teachings of sending updated cell identifiers with Putkiranta's teachings of the service server and mobile station communicating with each other, so that the service server can update the list of identifiers that define each localized service area. Ex.1003 ¶58.

Accordingly, A POSITA would have found it obvious to combine the teachings of Putkiranta and Kraufvelin in the manner described above. *See* §XI.C.3; Ex.1003 ¶59.

4. Claim 1

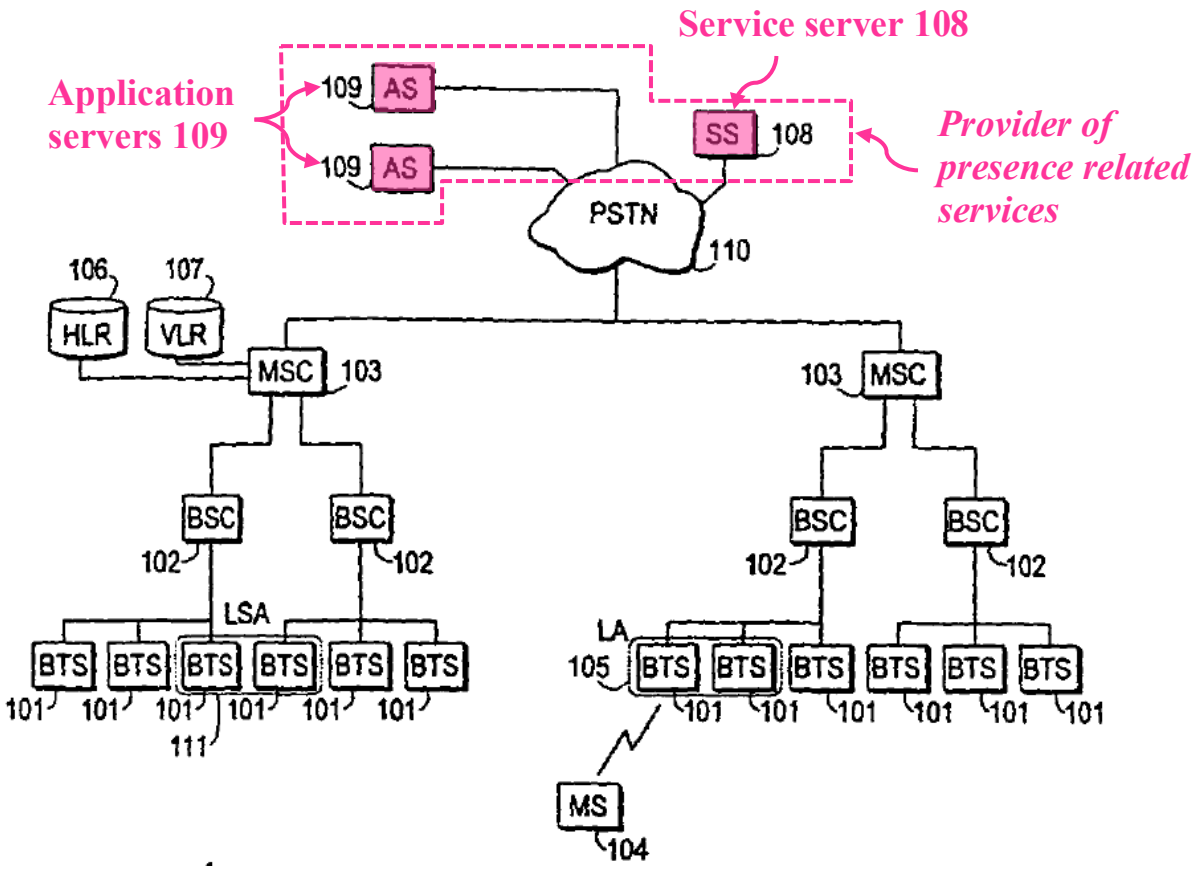
[1.0] ***A method associated with a provider of presence related services***

To the extent the preamble of claim 1 ([1.0] – [1.1]) is limiting, it is rendered obvious by Putkiranta-Kraufvelin. Ex.1003 ¶¶60-62

Putkiranta describes "**a method** and system for **making services provided by a network available** to the user in various ways **depending on the location of the user**[.]" Ex.1005, 2:9-12. Putkiranta teaches that system includes "**a service server (SS) 108 and application servers (AS) 109**" (collectively *a provider of presence related services*) that are "connected to the cellular radio network through wire links[.]" Ex.1005, 4:25-27; Ex.1003 ¶61. Putkiranta describes that "[t]he role of the service server…is to **maintain information about which mobile stations are in which localized service areas and which services should be offered to**

them accordingly," while the "actual service is provided by the application server." Ex.1005, 6:22-26. Putkiranta's service server 108 and application servers 109 thus collectively teach the *provider of presence related services*, because the service server 108 and application servers 109 provide services to the mobile device in the localized service area in which the mobile device is located. *See* Ex.1005, 6:22-26; Ex.1003 ¶61.

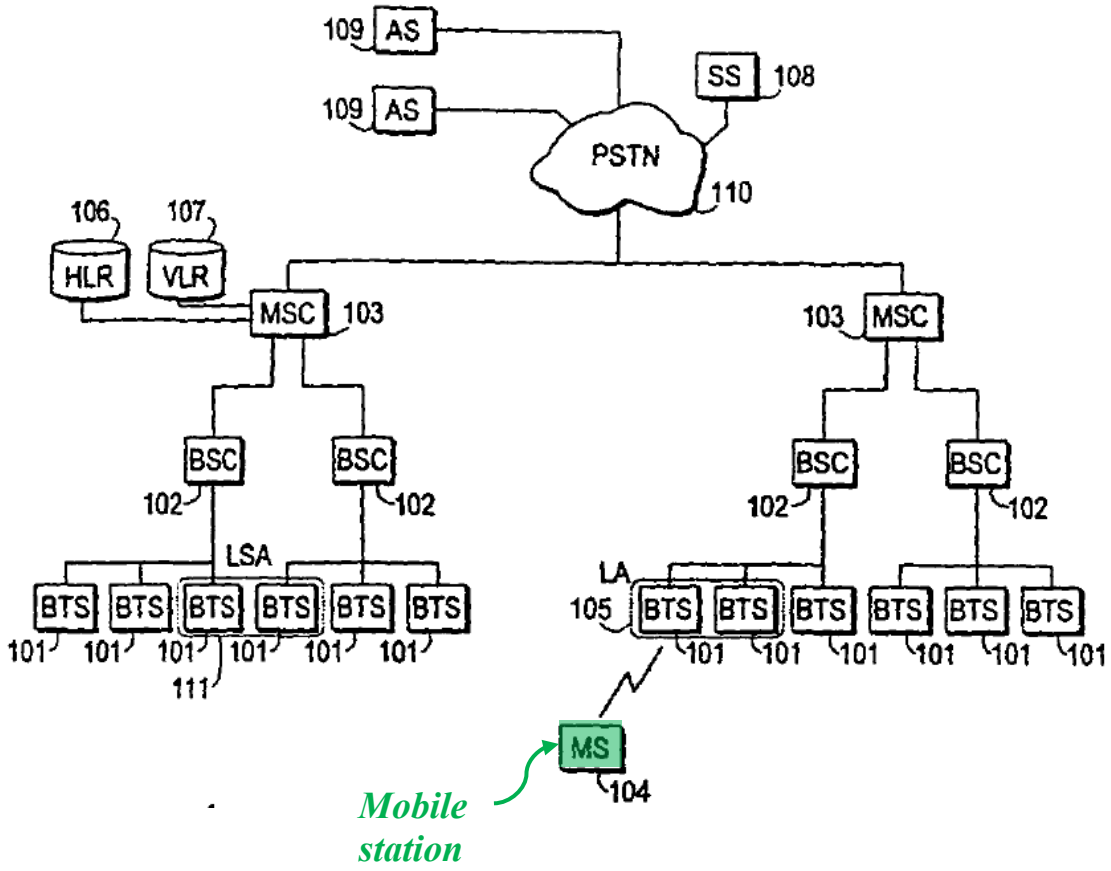
Putkiranta's FIG. 1, annotated below, shows the service server 108 and application servers 109 (collectively the *provider of presence related services*) connected to a "cellular radio network" via the public switched telephone network (PSTN) 110. Ex.1005, FIG. 1, 4:13-34; Ex.1003 ¶62.



Ex.1005, Detail of FIG. 1 (annotated)

[1.1] ***in connection with the use of a mobile station that is operable within a mobile telephone network, and at least a first radio communication defining device that transmits a first distinctive defining signal, the first distinctive defining signal at least partly defines a special area by its coverage, the provider of presence related services having one or more servers, the method comprising:***

Putkiranta's FIG. 1 shows the mobile station 104 operating in the "cellular radio system." Ex.1003 ¶¶63-69.

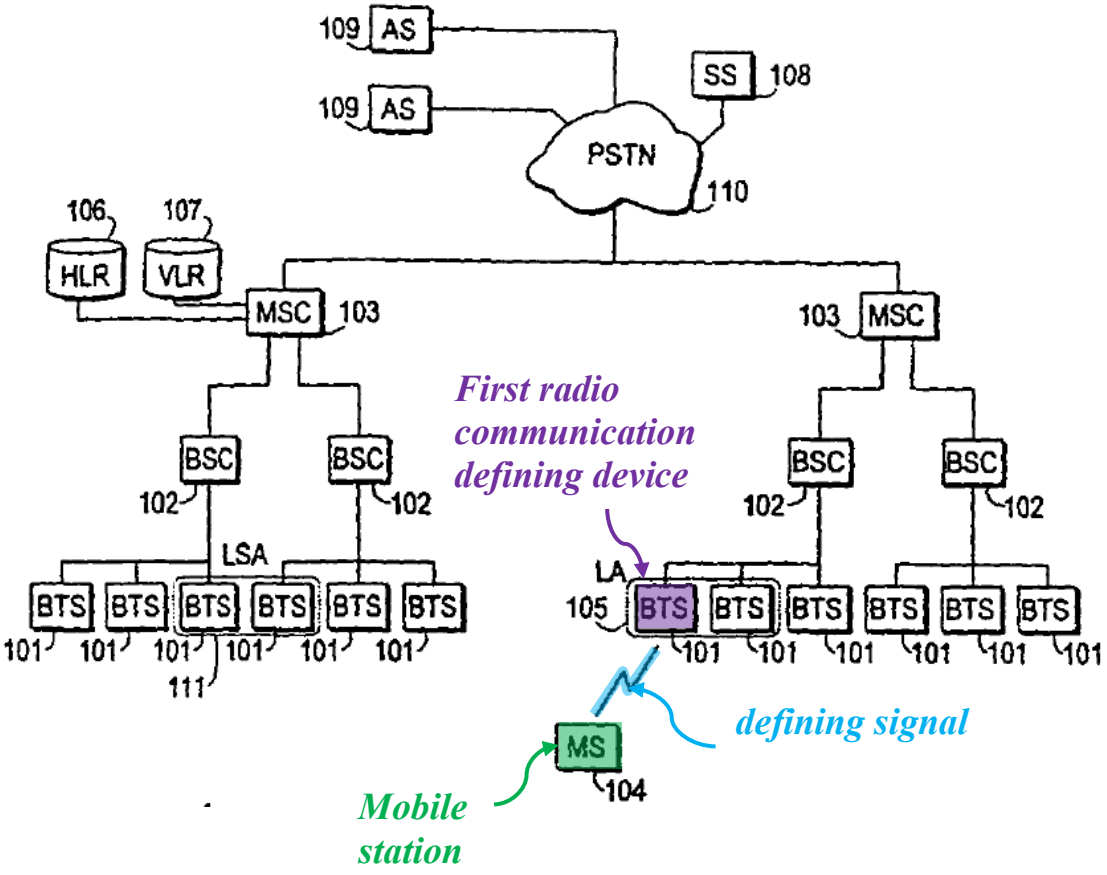


Ex.1005, Detail of FIG. 1 (annotated)

Putkiranta describes that "FIG. 1 shows a cellular radio system 100…compris[ing] **base transceiver stations (BTS) 101**" (*a first radio communication defining device*). Ex.1005, 4:13-14. Putkiranta teaches that "**every base transceiver station** in known cellular radio systems **sends general control information that can be received in the whole cell area**" (*a first…defining signal*) "and which e.g. **comprises the unequivocal identifier of the base transceiver station** or some other information characteristic of the base transceiver station." Ex.1005, 4:63-5:1. Putkiranta describes that mobile station

(MS) 104is "connected via radio to at least one base transceiver station 101" (*a mobile station that is operable within a mobile telephone network*). Ex.1005, 4:16-17; Ex.1003 ¶65.

Putkiranta's FIG. 1 shows the BTS 101 (*first radio communication defining device*) transmitting the general control information (*first…defining signal*) to the *mobile station* 104. Ex.1005, FIG. 1, 4:63-5:1; Ex.1003 ¶66:



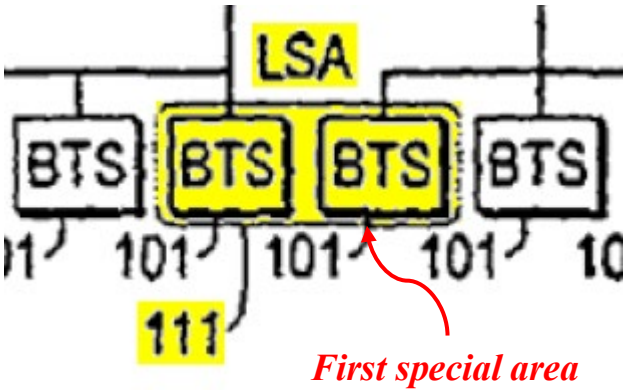
Ex.1005, Detail of FIG. 1 (annotated)

Putkiranta further teaches that the "the system considers the mobile station to be located in that **location area (LA) 105 to which the coverage area, or cell,**

of that particular base transceiver station belongs." Ex.1005, 4:16-20. "A location area may comprise one or more cells." Ex.1005, 4:20-21.

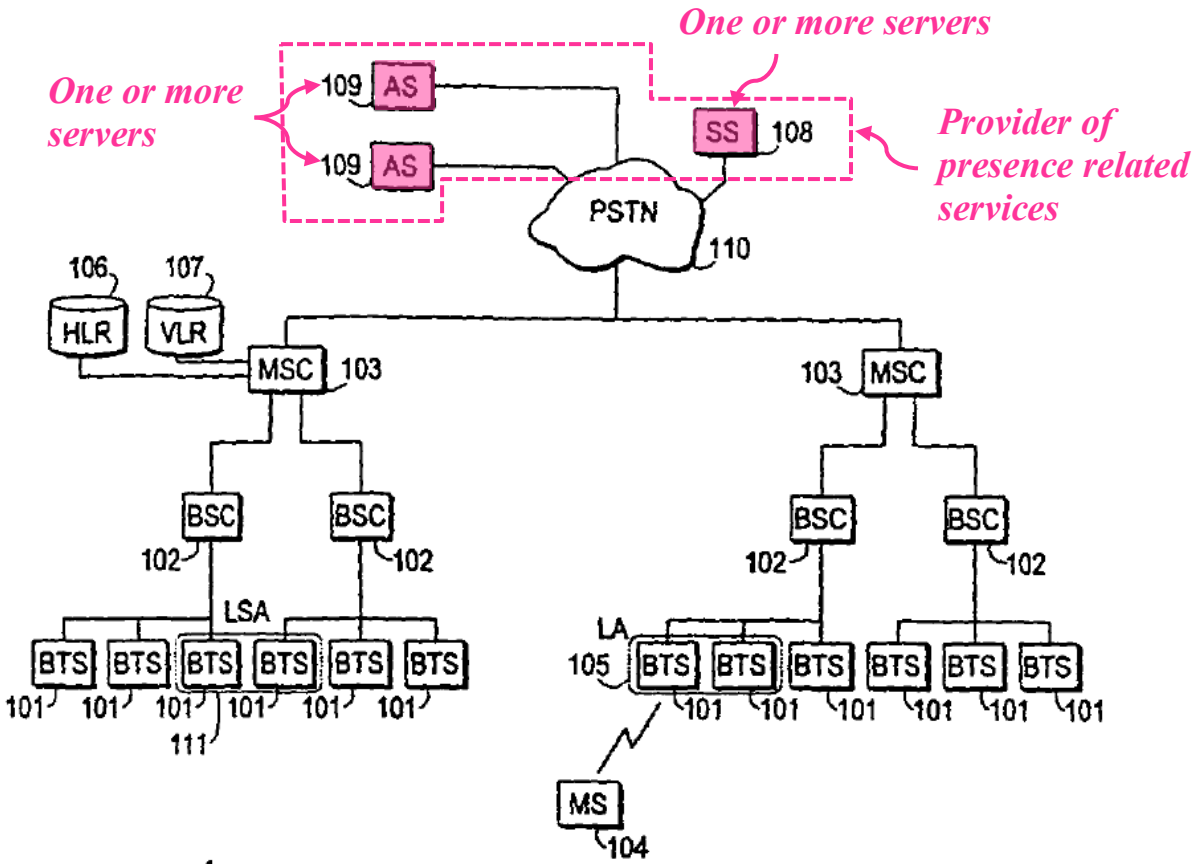
With respect to a *special area* defined by a *distinctive defining signal*, Putkiranta further describes a "**localized service area**" or "LSA" (*a first special area*) as an area in which "a mobile station receives a certain service." Ex.1005, 2:54-56, 4:35-51, 7:23-24. A localized service area may be defined by "a base station cell, several cells, a location area (LA),…certain cell identifiers, or an area in which base stations send to mobile stations some other identifier." Ex.1005, 2:54-64. In Putkiranta, the transmission of general control information from a base station is distinctive (*a first distinctive defining signal*) when its "coverage area" defines an area that makes up at least part of a localized service area (*a first special at least partly define[d]* by *the first distinctive defining signal*). *See* Ex.1005, 4:35-51, 2:54-56; Ex.1003 ¶67.

The following detail from Putkiranta FIG. 1 shows an LSA 111 (*first special area*) that is defined by the "coverage area" of two base transceiver stations 101. Ex.1005, 4:35-51; Ex.1003 ¶68:



Ex.1005, Detail of FIG. 1 (annotated)

Putkiranta's service **server** 108 and application **servers** 109 (*the provider of presence related services having one or more servers*) provide services to the mobile device in the localized service area via the PSTN and cellular network. Ex.1005, FIG. 1; Ex.1003 ¶69.



Ex.1005, Detail of FIG. 1 (annotated)

[1.2] ***electronically storing in the one or more servers of the provider of presence related services data capable of linking the mobile station to the special area, the data including a checking data of the first radio communication defining device and an identifier related to the mobile station,***

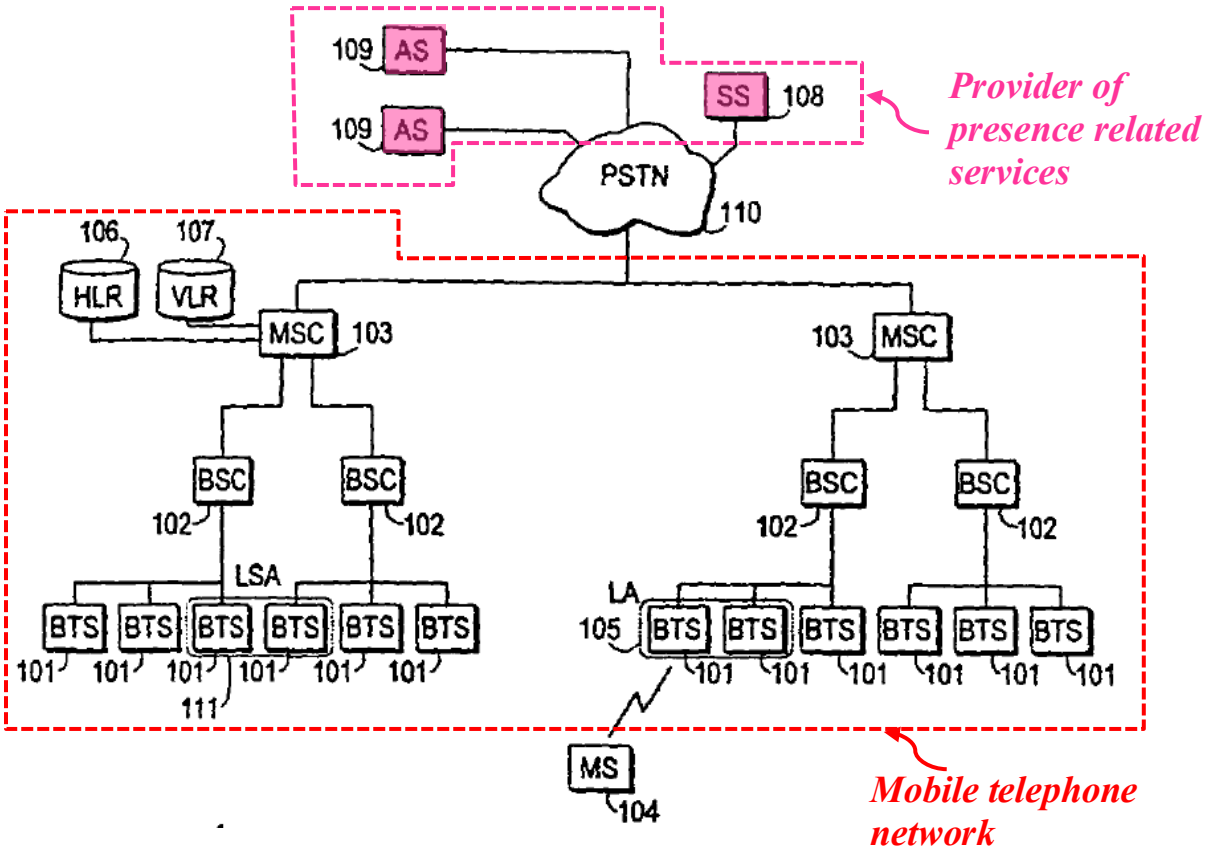
Putkiranta teaches that the service server stores (*electronically storing in the one or more servers of the provider of presence related services*) the claimed *data capable of linking the mobile station to the first special area*. Ex.1003 ¶¶70-71. Putkiranta describes that "role of the service server…is to **maintain information about which mobile stations are in which localized service areas**" (*data capable*

of linking the mobile station to the first special area). Ex.1005, 6:22-25; Ex.1003 ¶70. Putkiranta explains that in the context of its invention, a "localized service area may be defined" by "a **base station cell**" and "**cell identifiers**" (*the data including a checking data of the first radio communication defining device*). Ex.1005, 2:54-64. Putkiranta further explains that mobile stations are identified with "an **identifier characteristic of the mobile station**" such as "an IMSI (International Mobile Subscriber Identifier) code or MS-ISDN (Mobile Subscriber Integrated Services Digital Network) number[.]" (*first identifier related to the mobile station*). Ex.1005, 6:6-12. Putkiranta describes that the service server "**store[s]**" (*electronically stor[es]*) this data in its memory. Ex.1005, 6:26-30; *see also* 2:22-32, 6:59-63. This allows the service server to "read[] from its memory which services should be offered to the mobile station in that localized service area." Ex.1005, 6:26-30; Ex.1003 ¶70.

Thus, the service server stores "information about which mobile stations are in which localized service areas," where the mobile station is identified by an IMSI or MS-ISDN and the localized service area is defined by a base station cell identifier, rendering obvious *data capable of linking the mobile station to the first special area, the data including a checking data of the first radio communication defining device and a first identifier related to the mobile station*. Ex.1003 ¶71.

[1.3] ***the provider of presence related services being different than the mobile telephone network,***

Putkiranta describes that the service server 108 and application server 109 may be "connected to the cellular radio network through wire links" and "routed via the public switched telephone network (PSTN) 110." Ex.1005, 4:13-31, FIG. 1; Ex.1003 ¶¶72. When connected via the PSTN, the service server 108 and application server 109 (*the provider of presence related services*) are *different than the mobile telephone network* because Putkiranta describes this configuration as an alternative to the service server 108 and application server 109 being "part of the cellular radio system" (*the mobile telephone network*). *See* Ex.1005, 4:28-34 (explaining that the servers can be implemented as "part of the cellular radio system, **or** routed via the public switched telephone network"); Ex.1003 ¶72. Putkiranta's FIG. 1, as annotated below, shows the service servers 108 and application server 109 (*the provider of presence related services*) separate from the cellular radio network (*the mobile telephone network*, outlined in red) and connected to it via the PSTN:



Ex.1005, Detail of FIG. 1 (annotated)

[1.4] ***receiving in the one or more servers of the provider of presence related services from the mobile station via the mobile telephone network an updating signal uncorrelated to any mobile station phone call establishment that identifies the mobile station's presence in the special area,***

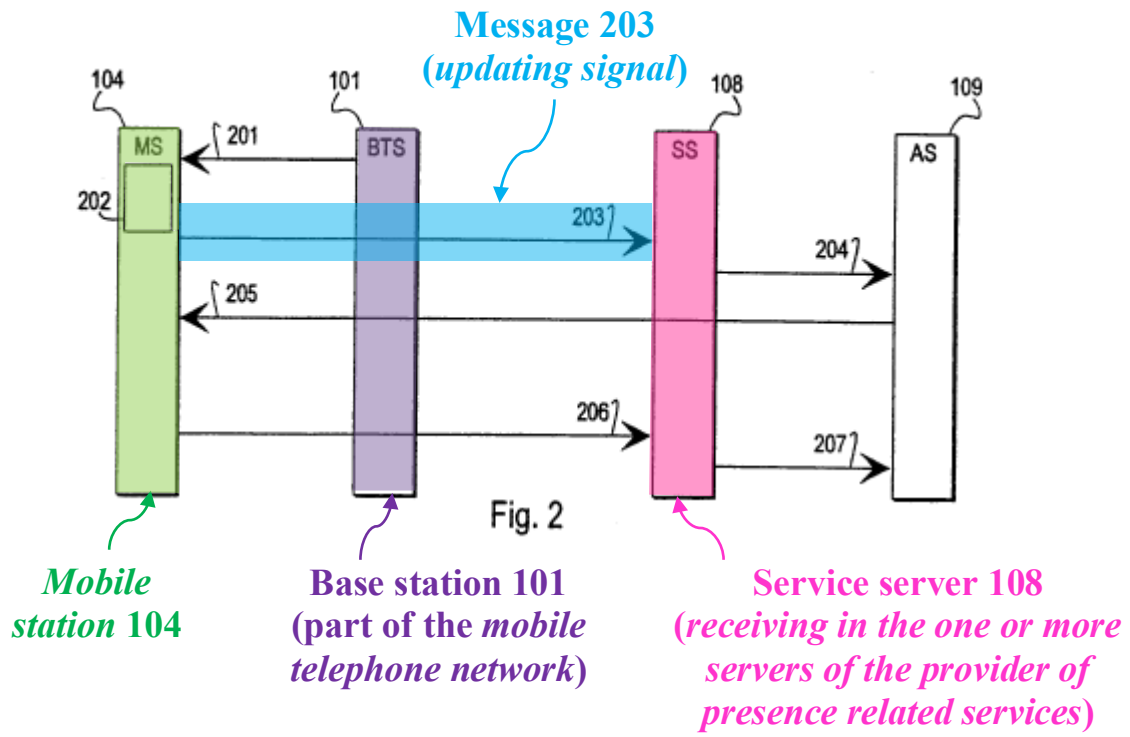
Putkiranta describes that "the mobile station is arranged so as to **send**—in response to the recognition of a localized service area—**a notification of its arrival in the localized service area**" (*an updating signal…that identifies the mobile station's presence in the special area*). Ex.1005, 2:37-39; Ex.1003 ¶¶73-75. Specifically, Putkiranta teaches that when "the mobile station **detects that it has**

arrived in a certain localized service area" (*the special area*), the mobile station "**sends to the service server a message 203,**" as shown in Putkiranta's FIG. 2 below. Ex.1005, 6:3-12. Message 203 "includes an identifier characteristic of the mobile station" and "the location of the mobile station[] in relation to localized service areas." Ex.1005, 6:3-12, 2:22-32, 9:53-54 ("the message specif[ies] that the apparatus is in the localized service area"); Ex.1003 ¶73. Accordingly, Putkiranta's message 203 serves to *identif[y] the mobile station's presence in the special area* because it notifies the service server upon arrival within the localized service area, and includes a unique identifier of the mobile station (*e.g.*, an "IMSI" code or "MS-ISDN" number) in the notification. Ex.1005, 6:6-12, 8:61-9:1, FIGs. 2, 5; Ex.1003 ¶73.

Putkiranta further teaches that the mobile station sends message 203 (*an updating signal*), for example, using an "**SMS message**" or a **GSM "USSD message"** (*via the mobile telephone network* and *uncorrelated to any mobile station phone call establishment*). Ex.1005, 6:13-21; *see also* Ex.1001, 16:60-64 (describing that the updating signal can be sent "using the **USSD** ('Unstructured Supplementary Service Data', **GSM standards**) channel"). Putkiranta contrasts these two non-phone call establishing options with a third option that "establish[es] a call connection to the service server." Ex.1005, 6:13-21; Ex.1003 ¶74.

Putkiranta's FIG. 2 below shows the service server 108 receiving the

message 203 (*an updating signal*) from the mobile station 104 via the base station 101, which is part of *the mobile telephone network* (*receiving in the one or more servers…from the mobile station via the mobile telephone network an updating signal*). Ex.1005, 6:13-21, FIG. 2; Ex.1003 ¶75:



Ex.1005, Fig. 2 (annotated)

[1.5] ***the one or more servers of the provider of presence related services deriving from the updating signal by one or more processing devices having access to at least a portion of the data whether or not the mobile station is present in the special area; and***

As previously discussed in [1.1], Putkiranta teaches that the service server 108 receives the message 203 (*the updating signal*) from the mobile station. As explained below, the service server is a *processing device[]* because it "examines"

the message and "recogniz[es]" whether the mobile station is in a localized service area. Ex.1005, 6:26-30, 8:66-9:8; *see also* Ex.1040 ¶¶26, 66 (a "server" includes "one or more processing devices," *e.g.* "a plurality of processors"); Ex.1041 ¶31 (a "server" includes "one or more processing devices"); Ex.1003 ¶76.

In more detail, Putkiranta teaches that "[h]aving received message 203" (*the updating signal*, *see* [1.4]) "**the service server**" "**reads from its memory which services should be offered to the mobile station in that localized service area**" (*deriv[es] from the updating signal whether or not the mobile station is present in the first special area*). Ex.1005, 6:26-29. Further, "the service server…maintain[s] information about which mobile stations are in which localized service areas and which services should be offered to them accordingly," and thus *ha[s] access to at least a portion of the data* capable of linking the mobile station to the first special area. Ex.1005, 6:22-25; Ex.1003 ¶77.

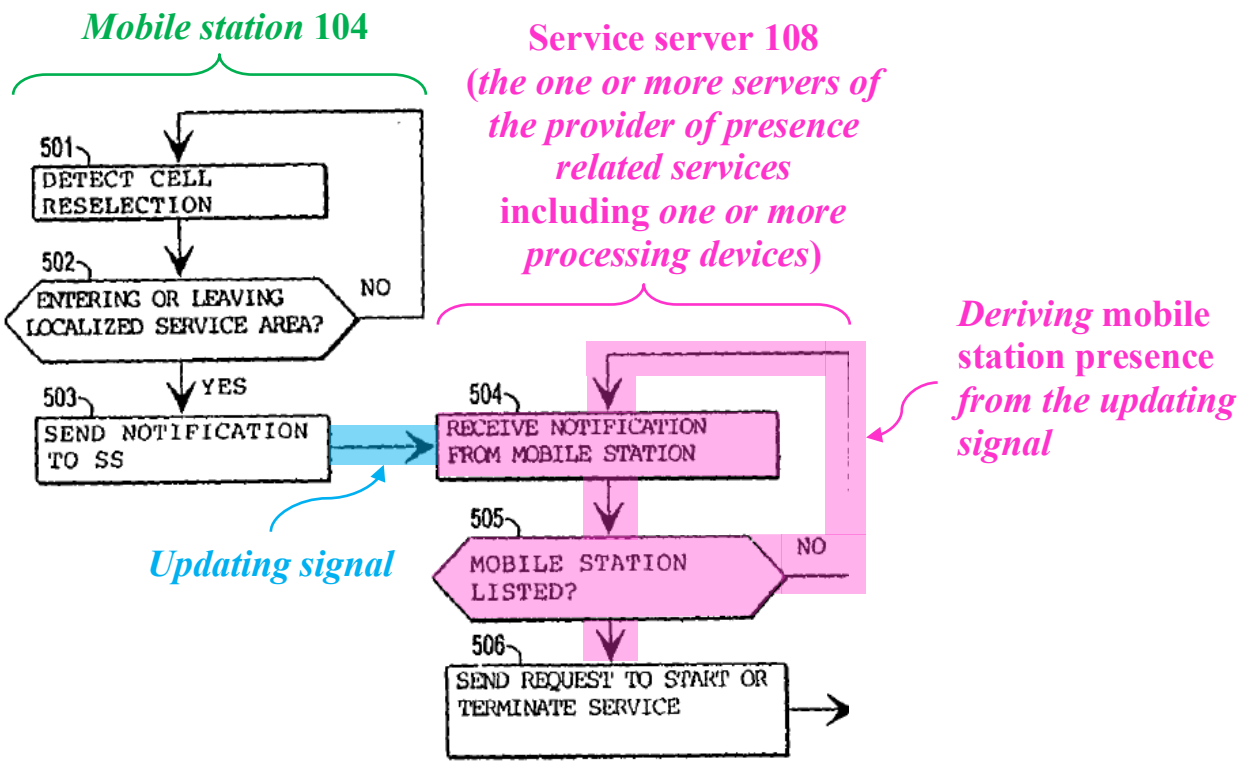
Putkiranta elaborates on this functionality with FIG. 5 (below). Upon "reception of the message" from the mobile station (*the updating signal*) at block 504 indicating it has entered or left a localized service area,

> the service server examines whether the mobile station in question **is on the list of those to be served**. If the mobile station is arriving in a localized service area, **it is in block 505 recognized as a mobile station which is to be served**. If, on the other hand, the mobile station is leaving

> a localized service area, **it is recognized in block 505 as a mobile station the services to which have to be terminated**.

Ex.1005, 9:2-8; Ex.1003 ¶78.

Putkiranta thus teaches the service server "recognizing" (*deriving*), from the *updating signal* and the stored list of mobile stations *(at least a portion of the data)*, the mobile station "as a mobile station which is to be served" or "as a mobile station the services to which have to be terminated" (*whether or not the mobile station is present in the first special area*). Ex.1005, 9:2-8, FIG. 5; *see also* 2:45-53 ("information is generated" by the service server "about the arrival of a mobile station in a localized service area" in response to receiving the message 203 (*updating signal*)); Ex.1003 ¶79. The following annotated detail from Putkiranta's FIG. 5 shows this process:



Ex.1005, Detail of FIG. 5 (annotated)

Further, Kraufvelin teaches that a component of the mobile telephone network performs "a verification—or sanity check—of the" notification (*e.g.*, *an updating signal*) from a mobile station that it has entered a particular geographical area (*e.g.*, *a first special area*). Ex.1006 ¶107. Kraufvelin teaches that the "cell-ID returned" by the mobile station in the updating signal "is verified" by a component of the mobile telephone network (*e.g.*, Putkiranta's service server) "to ensure that the cell is still within the intended geographical area." Ex.1006 ¶109. "This may be achieved by comparing the current cell-IDs of the intended geographical area stored in the network with the cell-ID returned response from the terminal." Ex.1006 ¶109. In the combination, Putkiranta's service server implements

Kraufvelin's "sanity check" functionality, and *derives* from the mobile station's notification (*the updating signal*) *whether or not the mobile station is present in the first special area* by "comparing the current cell-IDs of the" localized service area (*first special area*) "stored in the network with the cell-ID returned" (*the updating signal*). Ex.1006 ¶109; Ex.1005, 6:26-29, 9:2-8; Ex.1003 ¶80.

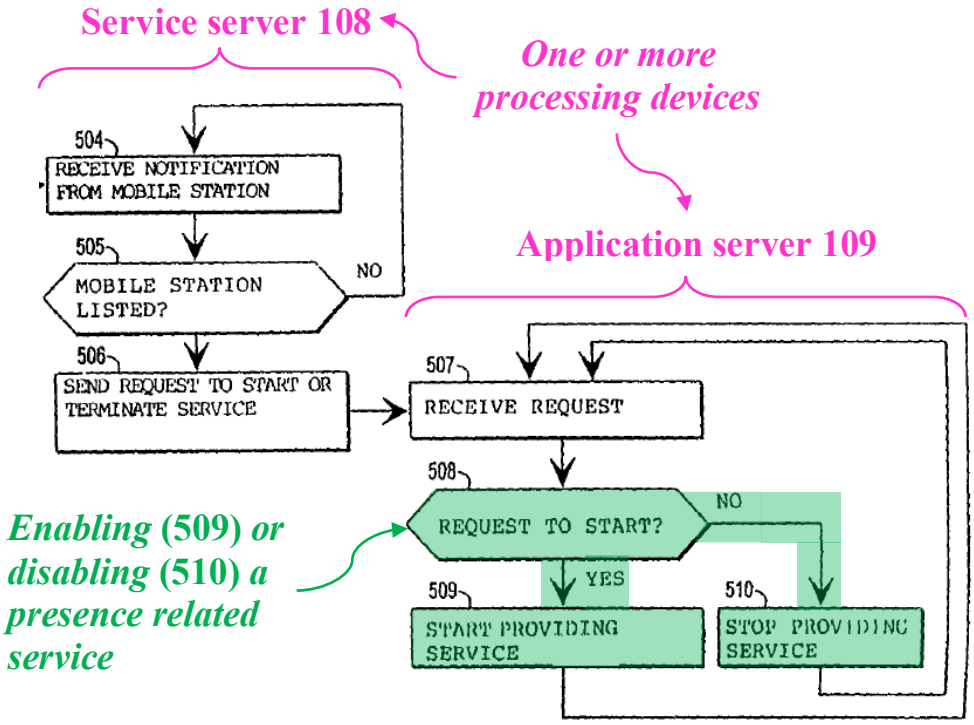
As described above (§XI.C.3), a POSITA would have been motivated to implement functionality based on Kraufvelin's "sanity check" feature with Putkiranta's service server to, *e.g.*, ensure that the mobile station is actually present in the localized service area, and thus that the system delivers the appropriate presence related services to the mobile station. Ex.1006 ¶108; Ex.1003 ¶81.

[1.6] ***enabling or disabling by use of the one or more processing devices a presence related service based upon the mobile station's presence or non-presence in the special area.***

After Putkiranta's service server determines whether the mobile station is in a localized service area (*see* [1.5), and, if it is, the service server "reads from its memory which services should be offered to the mobile station **in that localized service area**." Ex.1005, 6:27-30. The service server then sends "[a] corresponding message" to "**an application server**" (which includes *one or processing devices, see* [1.5]) instructing the application server to "start" or "terminate" a service configured for mobile stations in that localized service area (*based upon the mobile station's presence or non-presence in the first special area*). Ex.1005, 8:66-9:12.

Referring again to Putkiranta's FIG. 5 below, "the application server which receives the message in block 507 [] determines in block 508 whether the message calls for the **starting or termination of a service**" (*enabling or disabling…a presence related service*). Ex.1005, 9:8-12. "The service is then either **started 509**" (*enable[ed]*) "or **terminated 510**" (*disable[ed]*) "for the mobile station." Ex.1005, 9:12-14; Ex.1003 ¶82. Because Putkiranta's service server instructs the application server to start or terminate services *based upon the mobile station's presence or non-presence in the first special area*, the application server starts or terminates a service (*enabling or disabling…a presence related service*) *based upon the mobile station's presence or non-presence in the first special area*. Ex.1005, 8:66-9:14, 2:22-32; Ex.1003 ¶¶82-83.

The following annotated detail from FIG. 5 of Putkiranta shows this process:



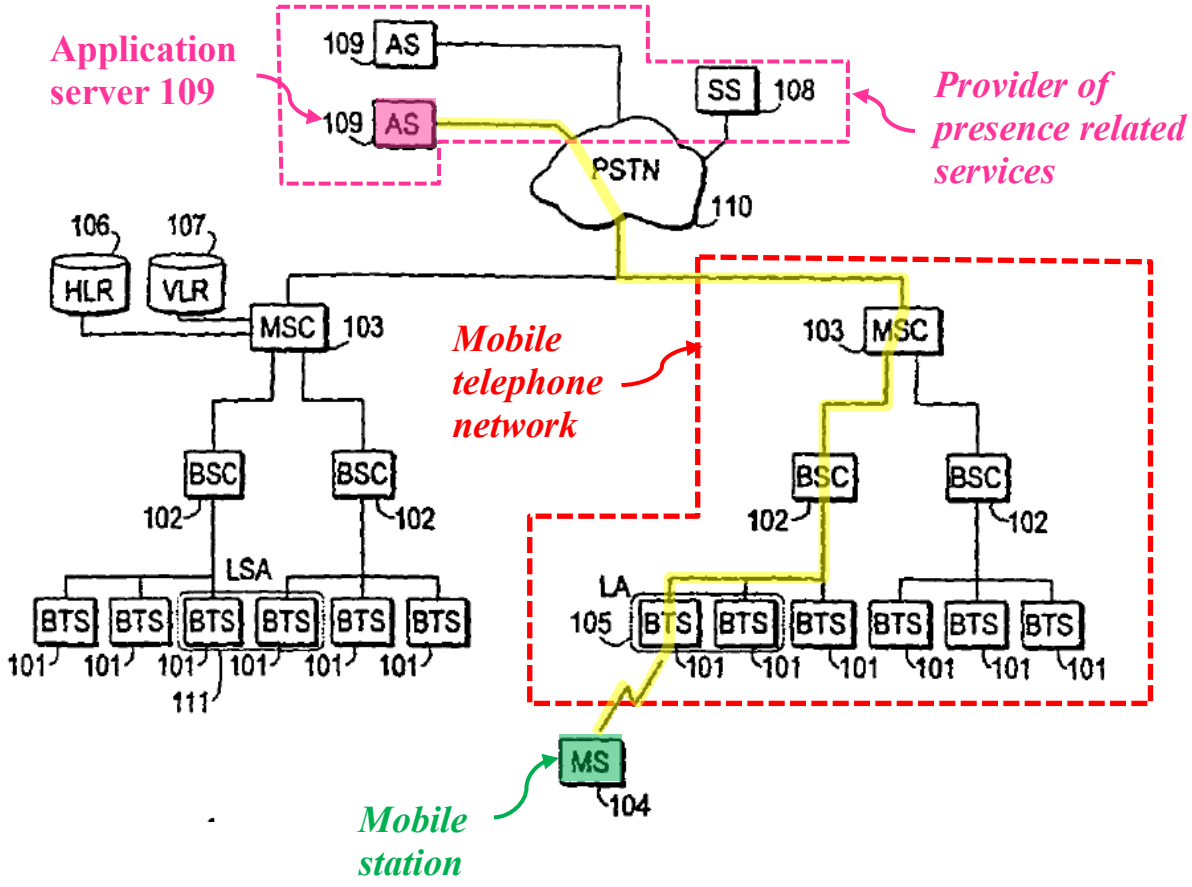
Ex.1005, Detail of FIG. 5 (annotated)

5. Claim 4

As discussed in [1.6], Putkiranta's application server "determines in block 508 whether the message calls for the **starting or termination of a service**" (*the enabling or disabling of the presence related service*). Ex.1005, 9:8-12. The application server then "**provides the mobile station with a service**" (*e.g.*, FIG. 2's arrow 205). Ex.1005, 6:38-40; Ex.1003 ¶84. This operation involves the application server *transmitting* "a simple **message**" (*e.g.,* 205 in FIG. 2) (*a signal*) *to the mobile station* to cause "activation or inactivation" (*that is capable of being used to enable or disable*) of a service at the mobile station (*one or more related functions in the mobile station*). Ex.1005, 6:40-42, 6:51-52 (services including,

e.g., automatic call transfer and/or voice mail); Ex.1003 ¶84.

Putkiranta teaches that the application server 109 transmits messages (*e.g.,* message 205) to the mobile station 104 via "the cellular radio network" (*the mobile telephone network*) including "base transceiver station (BTS) 101." Ex.1005, 4:13-27, FIG. 1 (below). Putkiranta's application server 109 is "connected to the cellular radio network through wire links," such that messages between the application server 109 and the mobile station 104 pass through the "cellular radio network." Ex.1005, 4:13-27, FIG. 1; Ex.1003 ¶85. Putkiranta's FIG. 1 (below), shows that the path of message 205 (yellow) from the application server 109 to the mobile station 104 passes through the cellular radio network (outlined in red):



Ex.1005, Detail of FIG. 1 (annotated)

6. Claim 5

As discussed in [1.2], Putkiranta's service server "maintain[s] information about which mobile stations are in which localized service areas" (*data including checking data*). Ex.1005, 6:22-25; Ex.1003 ¶86. Putkiranta's service server "store[s]" this data in its memory (*the storing of the checking data in the one or more servers of the provider of presence related services*, *see* [1.2]). Ex.1005, 6:26-30; *see also* 2:22-32, 6:59-63; Ex.1003 ¶86. Putkiranta further teaches that the service server "receive[s]" (*electronically receives*) "Message 203" *from the*

mobile station when "the mobile station detects that it has arrived in a certain localized service area." Ex.1005, 6:3-12, 6:26-30. Message 203 "includes an identifier characteristic of the mobile station" and "specif[ies] that the apparatus is in the localized service area," where the localized service area is defined by base station "cell identifiers" (*the checking data*). Ex.1005, 6:6-12, 9:53-54, 2:54-64, 2:22-32; Ex.1003 ¶86. The service server "maintain[s]" its "information about which mobile stations are in which localized service areas" by storing, from the message 203 received from the mobile station, the particular localized service area (*checking data*) in association with the identifier characteristic of the mobile station. Ex.1005, 6:22-30; *see also* 2:22-32, 6:59-63; Ex.1003 ¶86.

7. Claim 6

As discussed in [1.1], Putkiranta teaches a "**cellular** radio system 100" (*mobile telephone network*) that includes the BTS 101 to which the mobile station 104 is connected. Ex.1005, 4:13-20, FIG. 1; Ex.1003 ¶87.

8. Claim 7

As previously discussed in [1.4], Putkiranta teaches that when "the mobile station **detects that it has arrived in a certain localized service area**" (*a previous determination performed by the mobile station about the mobile station's presence in the first special area*), the mobile station "sends to the service server a message 203" (*the updating signal*) that "specif[ies] that the apparatus is in the localized

service area." Ex.1005, 9:53-54, 6:3-8; Ex.1003 ¶88.

9. Claim 8

As discussed in [1.4], Putkiranta teaches that the mobile station "sends to the service server a message 203" (*the updating signal is received in the one or more servers of the provider of presence related services via the mobile telephone network from the mobile station*) indicating its presence in a localized service area. Ex.1005, 6:6-12. Putkiranta describes that message 203 (*the updating signal*) may be sent when the mobile station "**is arriving in**" or "**leaving a localized service area**" (*at times recent to when the mobile station enters into or exits from the first special area*). Ex.1005, 8:61-65, FIG. 5; Ex.1003 ¶89. Message 203 (*the updating signal*) is sent after the mobile station remains in a localized service area for "a certain period of time" to "**renew its message of arrival in the localized service area**" (*when the mobile station remains in the first special area*). Ex.1005, 3:25-36; Ex.1003 ¶89. Putkiranta also teaches the mobile station sending message 203 (the updating signal) "**periodically**" as a "periodic location update (PLU) message." Ex.1005, 3:28-30; Ex.1003 ¶89.

10. Claim 9

As discussed in [4.0], Putkiranta teaches that the application server (part of the *provider of presence related services*) *enables or disables the provision of the service depending on the presence of the mobile station in the first special area*.

Putkiranta teaches that "message 203" (*the updating signal*) is "intended to function as an impulse for changing the service selection offered to the mobile station" (*comprises a request to access to a multimedia content*). Ex.1005, 2:34-41, 6:3-12, 6:22-34, 6:53-56; Ex.1003 ¶90. Putkiranta's service selections include both more traditional services and *multimedia content* such as "routing of incoming email messages to a mobile station[.]" Ex.1005, 6:42-52; Ex.1003 ¶90. And Putkiranta contemplates implementations of the service it provides for uses including "to send the day's menu at a cafeteria of a company to the mobile stations of all those employees who are within the premises of the company as lunchtime is approaching." Ex.1005, 1:50-55, claim 13 (providing localized services in "an airport or a cafeteria"); Ex.1003 ¶90.

11. Claim 10

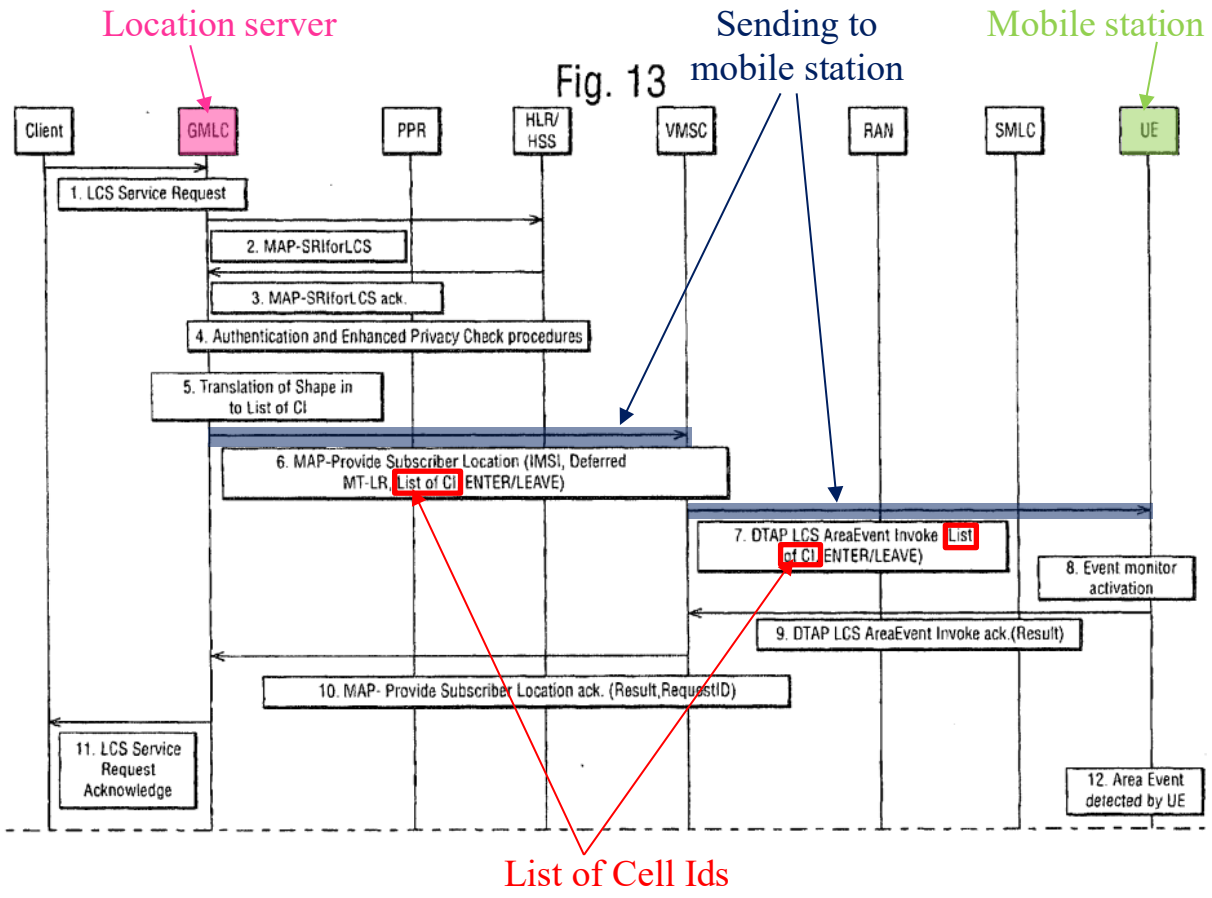
Claim 10 is substantially similar to claim 1, with minor differences. The analysis below addresses the added material in limitations [10.2]-[10.3]. Further, limitations [10.3]-[10.4] remove "of the provider of presence related services" following "the one or more servers," though that language appears in limitations [10.1]. Ex.1064 (comparison); Ex.1003 ¶91. Accordingly, the limitations with deleted elements are rendered obvious for the same reasons as discussed above with respect to claim 1.

[10.2]

Putkiranta teaches that the *mobile station* stores a list of base station identifiers (*checking data*) that it compares to a received identifier to determine whether it is in a localized service area. Ex.1005, 5:3-8. Putkiranta explains that networks may change the base stations associated with a particular localized service area by, for example, adding a new base station. Ex.1005, 5:14-22 (increasing communications capacity in a localized service area by adding a new base station). Because Putkiranta contemplates that the list of identifiers stored in the memory of the *mobile station* would need to be updated to accommodate changes to the base stations associated with a localized service area, it would have been obvious that the service server (*one or more servers*) sends a new list of identifiers to the *mobile station* when the network changes the base stations associated with the localized service area. Ex.1005, 5:14-22 (changes to the base stations associated with a localized service area accommodated by "send[ing] the identifier of the new base station to each mobile station to which the localized service area has been assigned"); Ex.1003 ¶92.

This type of implementation was well known, as demonstrated by Kraufvelin. Ex.1006 ¶¶107-115; Ex.1003 ¶93. Similar to Putkiranta, Kraufvelin explains that network "operators tune their networks on a daily basis" by changing the geographic area associated with certain base stations or changing the identifier

(cell-ID) associated with a base station. Ex.1006 ¶108]. Thereafter, "a cell-ID may no longer correspond with the intended geographical area." Ex.1006 ¶108]. To address this, Kraufvelin teaches that the service provider may "update the predefined area definition in all mobiles" by providing "the updated cell-ID information" (*transmitting at least a portion of the checking data*) to the mobile station. Ex.1006 ¶¶110-111; FIG. 13; Ex.1003 ¶93.



Ex.1006, FIG. 13 (annotated)

Thus, Kraufvelin teaches that, when the network changes the cell-ID information associated with a geographic area, an updated list of Cell Ids that reflect the geographic area is sent to the mobile station from the location services

server. Putkiranta's service server would transmit an updated list to mobile devices of IDs (*transmitting to the mobile station from the one or more servers at least a portion of the checking data*) when a change in area occurs. Ex.1003 ¶94.

[10.3]

Limitation [10.3] is substantially similar to limitation [1.4], additionally reciting *the updating signal including the identifier or other identifier related to the mobile station*.

Putkiranta teaches that the "message 203" (*the updating signal*, *see* [1.4]) includes "**an identifier characteristic of the mobile station**" (*including the identifier or other identifier related to the mobile station*) such as "an IMSI (International Mobile Subscriber Identifier) code or MS-ISDN (Mobile Subscriber Integrated Services Digital Network)[.]" Ex.1005, 6:8-12; Ex.1003 ¶¶95-96.

12. Claims 13-18

Claims 13-18 are substantially similar to claims 4-9, other than that each depends from claim 10, not claim 1. *See* Ex.1064 (comparison); Ex.1003 ¶97. Accordingly, claims 13-18 are rendered obvious for the same reasons as discussed with respect to claims 4-9.

D. Ground 2: Claims 2-3 and 11-12 are obvious over §103 over Putkiranta, Kraufvelin, and Granberg

1. Granberg

Granberg teaches "a database that stores and manages subscriptions" for a

number of subscriber devices (*e.g.*, cell phones). Ex.1037, 6:3-4. Granberg describes that the database "stores a number of subscriber records," each including "individual subscriber data such as MSISDN, IMSI, current VLR location, and supplementary services data." Ex.1037, 7:40-44. Granberg describes that "each subscriber record may include one or more network-specific indicators, *e.g.*, one or more flags, corresponding to one or more network-specific services." Ex.1037, 7:45-48. "Each network-specific indicator is then set or activated when that subscriber is to receive a corresponding network-based service in a network that supports that network-based service." Ex.1037, 7:49-53. Or, "[i]f that subscriber is not to receive the service" in the particular network to which it is presently registered, "the flag is reset or otherwise deactivated." Ex.1037, 7:53-54; Ex.1003, 98.

2. Reasons to combine Putkiranta, Kraufvelin, and Granberg

A POSITA would have found it obvious to modify the Putkiranta-Kraufvelin service server based on the teachings of Granberg. Ex.1003 ¶100. In the combination, the Putkiranta-Kraufvelin service server 108 (as previously modified based on Kraufvelin, *see* §XI.C3) maintains information, including activating or deactivating the "network-specific indicator" associated with a "network-based service" depending on the presence of the mobile station in a network that supports that particular "network-based service," based on the teachings of Granberg. *See*

Ex.1005, 4:21-25, 6:22-25, FIG. 1; Ex.1037, 7:45-54; §XI.D.2; Ex.1003 ¶99.

Granberg, like Putkiranta and Kraufvelin (*see* §XI.C.3), is analogous art because it is in the same field of endeavor as the '621 patent. *See In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004). The '621 patent relates to monitoring the presence of a mobile station in particular geographic areas. Ex.1001, Abstract. Granberg is similarly directed to monitoring the presence of a mobile station in particular geographic areas to properly configure which services are provided to the mobile station in that particular area. Ex.1037, Abstract (describing a method for selectively providing services to "mobile communication units" when roaming on networks outside their home network); Ex.1003 ¶101. Granberg is also reasonably pertinent to a problem the '621 patent attempted to solve: the lack of a way to "associate[e] new special areas" with a mobile device "without modifying any radio transmitting device." Ex.1001, 2:6-20. Granberg describes databases used "to more efficiently store information for network-specific information supplementary services for large numbers of mobile subscribers" and "efficiently administer and update network-specific supplementary services" for those mobile subscribers. Ex.1037, 3:57-63, 4:10-29.

A POSITA would have been motivated to implement functionality with the Putkiranta-Kraufvelin service server to maintain information in a database, including activating or deactivating the "network-specific indicator" associated

with a "network-based service" in the database depending on the presence of the mobile station in a network that supports that particular "network-based service," based on the teachings of Granberg. *See* Ex.1005, 4:21-25, 6:22-25, FIG. 1; Ex.1037, 7:45-54; §XI.D.2; Ex.1003 ¶102. A POSITA would have recognized that maintaining "network-specific indicators," like those taught in Granberg, with Putkiranta-Kraufvelin's service server teachings would provide an easily comprehensible summary of the status of particular services for a particular mobile station based on its location in the form of a list of flags (one for each service) indicating whether each service is currently enabled or disabled. *See* Ex.1005, 6:22-33; Ex.1037, 7:45-54; Ex.1003 ¶102. A POSITA would have recognized that such a status summary would benefit administrators of the Putkiranta-Kraufvelin service server by enabling them to easily determine which services were currently being provided to the mobile station in a particular location, thereby facilitating verification and troubleshooting of service configurations. *See* Ex.1005, 6:22-33; Ex.1037, 7:45-54; Ex.1039, 16:38-42 (describing the utility of a "status table" for "troubleshooting" network services); Ex.1003 ¶102.

In addition, this modification to Putkiranta-Kraufvelin represents a simple combination of prior art elements (the Putkiranta-Kraufvelin service server with Granberg's service configuration functionality), according to known methods to yield predictable results (the Putkiranta-Kraufvelin service server maintaining

service configuration information, as taught by Granberg, for use with activating and deactivating services based on the current location of the mobile station). *KSR*, 550 U.S. at 416; Ex.1003 ¶103.

Further, a POSITA would have been motivated to implement functionality based on the Granberg's service configuration feature with the Putkiranta-Kraufvelin service server teachings to achieve the same benefits and improve the Putkiranta-Kraufvelin system "in the same way" as the similar system of Granberg. *KSR*, 550 U.S. at 417 (finding obviousness when a known technique "would improve similar devices in the same way"); Ex.1003 ¶104.

A POSITA would have had a reasonable expectation of success making such a combination because Granberg teaches a system operating in the proposed manner. Ex.1037, 6:3-15, 7:34-54; Ex.1003 ¶105. Indeed, the combination is nothing more than "the predictable use of prior art elements according to their established functions." *KSR*, 550 U.S. at 417.

3. Claim 2

Putkiranta teaches that the "role of the **service server**" (which includes *one or more processing devices*, *see* [1.6]) "is to **maintain information about which mobile stations are in which localized service areas**" (*at least a portion of the data capable of linking the mobile station to the first special area*, previously discussed in [1.6]) "and which services should be offered to them accordingly."

Ex.1005, 6:22-25. Because the service server "maintains" this information, it also *has access* to it. Ex.1005, 6:22-25; Ex.1003 ¶106.

While Putkiranta does not explicitly describe how the information regarding mobile stations would be maintained, it was well known in the art that such information would be stored *in a database*. For instance, Granberg describes a database "that stores and manages subscriptions." Ex.1037, 6:3-4. Granberg's database "stores subscriber records for mobile communication units" (*mobile station*), each including "individual subscriber data such as **MSISDN, IMSI, current VLR location**, and supplementary services data." Ex.1037, Abstract, 7:40-44. Granberg further describes that "each subscriber record may include **one or more network-specific indicators**" (*operating parameters*) "*e.g.*, one or more flags, **corresponding to one or more network-specific services**." Ex.1037, 7:45-48. "**Each network-specific indicator is then set or activated**" (*updat[ing] at least one operating parameter in a database of the provider of presence*) "**when that subscriber is** to receive a corresponding network-based service **in a network that supports that network-based service**" (*depending on the presence of the mobile station in the first special area*). Ex.1037, 7:49-53. Or, "[i]f that subscriber is not to receive the service" in the particular network to which it is presently registered, "the flag is reset or otherwise deactivated." Ex.1037, 7:53-54; Ex.1003 ¶107. Thus, Granberg teaches that a "**network-specific indicator**" (*operating*

parameter) in the database (*database of the provider of presence related services*) is either **"set"/"activated"** or **"reset"/"deactivated"** (*update[d]*) based on the network to which the subscriber (*mobile station*) is currently connected—specifically whether that particular network supports the particular "network-based service" associated with the "network-specific indicator" (*depending on the presence of the mobile station in the first special area*). *See* Ex.1037, 7:45-54; Ex.1003 ¶107.

In the combination, Putkiranta's service server 108 maintains information in a database of the service server, including activating or deactivating (*updating*) the "network-specific indicator" (*operating parameters*) associated with a "network-based service" *depending on the presence of the mobile station* in a localized service area that supports that particular "network-based service" (a *first special area*), based on the teachings of Granberg. *See* Ex.1005, 4:21-25, 6:22-25, FIG. 1; Ex.1037, 7:45-54; §XI.D.2; Ex.1003 ¶108. As discussed in §XI.D.2, it would have been obvious to implement such functionality with Putkiranta-Kraufvelin's service server based on Granberg's teachings. Ex.1003 ¶108.

4. Claim 3

As described at [2.0], in the combination, Putkiranta's service server 108 activates or deactivates a "network-specific indicator" (*operating parameter*) associated with a "network-based service," based on Granberg's teachings. *See*

[2.0]. Granberg teaches that the "network-specific indicators" (*operating parameters*) "corresponding to one or more network-specific services" include "**one or more flags**" (*a service flag*). Ex.1037, 7:45-48. Granberg teaches that activating or deactivating the flag activates or deactivates (*enables or disables*) a corresponding *service for the mobile station*. Ex.1037, 7:49-54 (the flag is "activated when that subscriber is to receive a corresponding network-based service," and "deactivated" when "that subscriber is not to receive the service"); Ex.1003 ¶109.

5. Claims 11-12

Claims 11-12 are rendered obvious for the same reasons as discussed with respect to claims 2-3. *See* §XI.D.2-3; Ex.1064 (comparison); Ex.1003 ¶110.

E. Ground 3: Claims 1, 4-10, and 13-18 are obvious under §103 over Rachabathuni

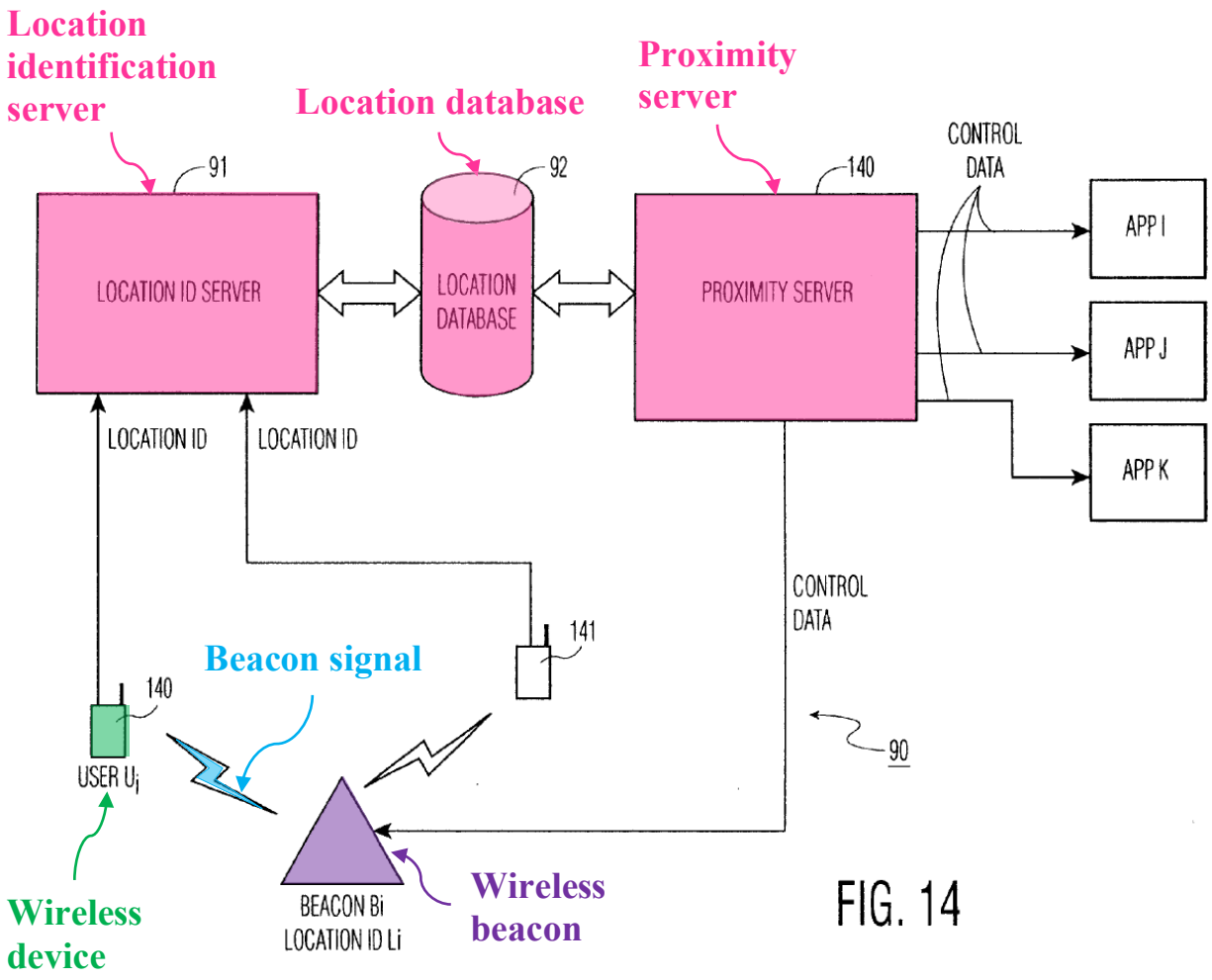
1. Rachabathuni

Rachabathuni describes a "method of selecting an application in a wireless device and a user location method[.]" Ex.1011, Abstract. Rachabathuni's method involves a "wireless device" (mobile station such as a "cell phone") receiving "beacon signal[s]" from "wireless beacons" including a "location identifier" associated with the particular beacon that transmitted the signal. Ex.1011, 4:28-60, 7:63-65. Because the location and coverage area of each wireless beacon is known, the physical location of a wireless device at a given time may be estimated based

on which beacon signal (or signals) it is currently receiving. Ex.1011, 6:59-64. When the wireless device receives a beacon signal, meaning it is located "in-range" of a particular wireless beacon, the wireless device sends a message to a "location identification server" including the received location identifier associated with that wireless beacon. Ex.1011, 6:45-57, 8:8-12. The "location identification server" stores a record in a "location database" indicating the user's presence at the location indicated by the location identifier (*e.g.*, within the coverage area of the particular wireless beacon associated with the location identifier) at that particular time. Ex.1011, 6:58-64.

Rachabathuni describes a "proximity server" that "uses the location information collected by the location identification server 91 and processes it to determine the proximity of…users to locations"—and "[b]ased on the information…modifies parts of the system it controls accordingly," for example by "control[ling] the wireless beacon 142 and selection of applications I, J, and K [shown in FIG. 14]." Ex.1011, 8:60-67; *see also id*., 5:5-13 (the beacons in the wireless system "provide a tailored set of applications covering a given geographical area").

Rachabathuni's "wireless system 90" in FIG. 14 performs the method:



Ex.1011, FIG. 14 (annotated)

Rachabathuni's "proximity server" "uses the location information collected by the location identification server 91 and processes [the location information] to determine the proximity of users to users and users to locations," and "[b]ased on the information…modifies parts of the system it controls accordingly," for example by "control[ling] the wireless beacon 142 and selection of applications I, J, and K [shown in FIG. 14]." Ex.1011, 8:60-67; *see also* 5:5-12 (the beacons "provide a tailored set of applications covering a given geographical area.").

Rachabathuni is analogous art because it is in the same field of endeavor as the '621 patent because it is similarly directed to monitoring the presence of a mobile station in particular geographic areas. Ex.1001, Abstract; Ex.1011, Abstract, 4:28-60, 6:45-57, 7:63-65, 8:8-12; Ex.1003 ¶113. Rachabathuni is also reasonably pertinent to a problem the '621 patent attempted to solve: the lack of a way to "associate[e] new special areas" with a mobile device "without modifying any radio transmitting device." Ex.1001, 2:6-20; Ex.1011, Abstract, 6:18-57; Ex.1003 ¶113.

2. Claim 1

[1.0]

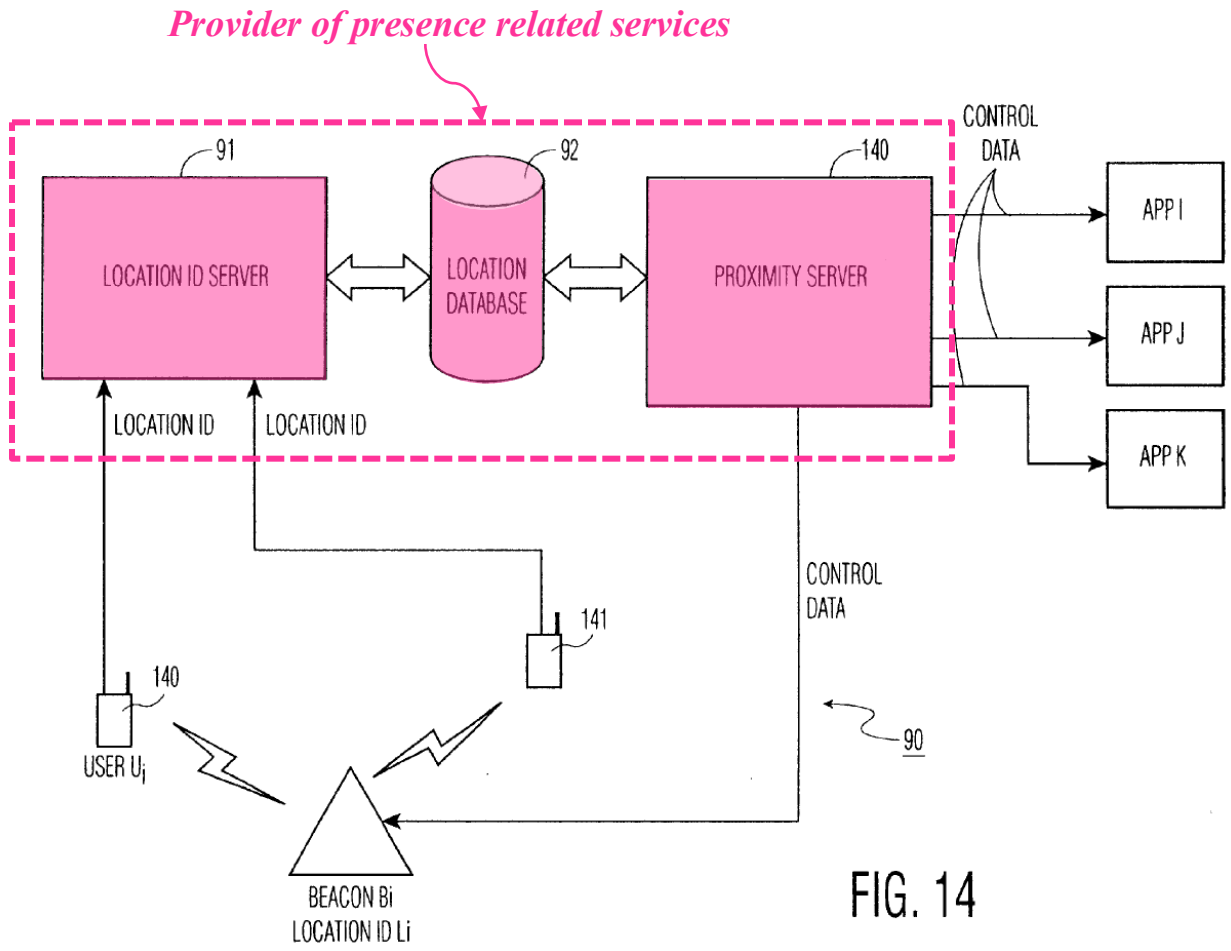
Rachabathuni describes a "**method** of selecting an application in a wireless device and a user location **method**[.]" Ex.1011, Abstract. The method generally involves a "wireless device" (such as a "cell phone") receiving "beacon signal[s]" from "wireless beacons" including a "location identifier" associated with the particular beacon that transmitted the signal, and the wireless device notifying a "location identification server" that tracks the location of the wireless device relative to the wireless beacons. Ex.1011, 4:28-60, 6:45-57, 7:63-65, 8:8-12; Ex.1003 ¶114.

Rachabathuni's "**location identification server 91**…is coupled to a **location database 92**." Ex.1011, 6:45-47; FIG. 14 (below). The "location identification

server 91 registers locations and user identities of users of wireless devices" based on the notifications received from the wireless devices, and stores this location information in the location database. Ex.1011, 6:55-65. Further, Rachabathuni's "**proximity server 140**" "uses the location information collected by the location identification server 91 and processes it to **determine the proximity of…users to locations**." Ex.1011, 8:61-63. "Based on [this] information," the proximity server "**modifies parts of the system** it controls accordingly," such as the "[s]election of applications" (services) on the wireless device. Ex.1011, 8:64-67.[1] Rachabathuni's location identification server, location database, and proximity server are thus configured to modify the services provided to a wireless device based on the device's proximity to a location (*i.e.*, *presence*), and therefore, collectively, comprise *a provider of presence related services*. *See* Ex.1011, 6:45-65, 7:5-8 ("**Services may be provided that use relative location information**"), 8:61-67; Ex.1003 ¶115.

Rachabathuni's FIG. 14 shows the *provider of presence related services*:

[1] Rachabathuni's "proximity server" operation is explained in greater detail in [1.5].



Ex.1011, FIG. 14 (annotated)

Rachabathuni's FIG. 14 above shows a "wireless system 90" used to perform the method described above, including the *provider of presence related services* (collectively the location identification server 91, the location database 92, and the proximity server 140). Ex.1011, 8:51-57, Ex.1003 ¶¶116-117.

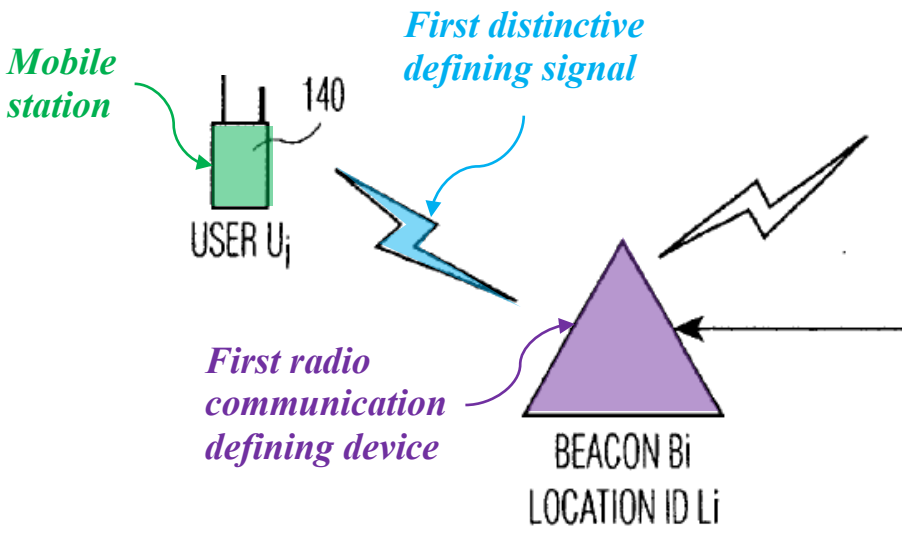
[1.1]

Rachabathuni's "**wireless device**" (*in connection with the use of a mobile station*) receives "beacon signal[s]" from a "**wireless beacon[]**" (*in connection*

with the use of…a first radio communication defining device). Ex.1011, 4:28-60, 6:45-57, 7:63-65. The wireless device then transmits the beacon information to the location identification server "through [a] wide area network or carrier network 97, that may be **a cellular network**" (*the mobile station…is operable within a mobile telephone network*). Ex.1011, 6:50-53, FIG. 9; Ex.1003 ¶118.

Rachabathuni's "wireless beacon" is configured to "**continuously broadcast**" (*transmit*) a "**beacon signal**" including a "location identifier" associated with the beacon. Ex.1011, 5:63-65, 6:47-50, 7:63-65 ("wireless device 93 transmits a location identifier it acquired from the wireless beacon 95 to the location identification server 91"), 8:56-57, 9:35-37, FIG. 9 (showing beacon signal from beacon 96 including a "LOCATION ID"), FIG. 14. The beacon signal with the location identifier is *a first distinctive defining signal* because the location identifier is unique and differentiates the beacon signal from signals transmitted by other beacons. Ex.1011, 7:46-47 ("location identifiers…**uniquely identify** a global location"), 7:63-65, 9:35-37.

Rachabathuni's FIG. 14 shows the *first radio communication defining device that transmits a first distinctive defining signal,* which is received by the *mobile station*. Ex.1003 ¶119.

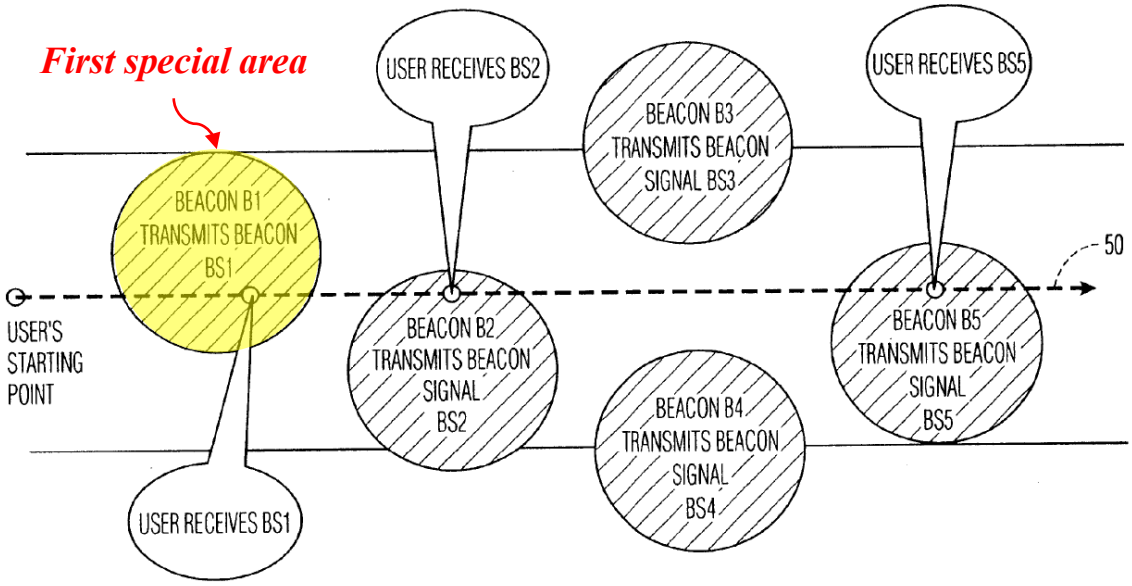


Ex.1011, Detail of FIG. 14 (annotated)

Further, "[w]hile roaming[,] the wireless device 7 enters into **a range of a wireless beacon**" (an *area at least partly defined by the coverage of the first distinctive defining signal*). Ex.1011, 5:56-58, 7:32-34, 8:8-14, FIGs. 5, 13. When the wireless device "enter[s] [the] **transmission ranges** of the beacons B1, B2 and B5," it receives beacon signals BS1, BS2 and BS5 "from respective wireless beacons B1, B2 and B5[.]" Ex.1011, 5:58-61, FIG. 5. Rachabathuni's system is configured to provide "location dependent services" to mobile stations located in the transmission range of a wireless beacon, such as within the transmission range of wireless beacon B1, and thus receive its beacon signal BS1 (*distinctive defining signal*). Ex.1011, 3:16-22. The transmission range of a wireless beacon (*e.g.*, B1 in FIG. 5) *at least partly defines a first special area* when the system is configured to provide "location dependent services" to mobile stations located within its

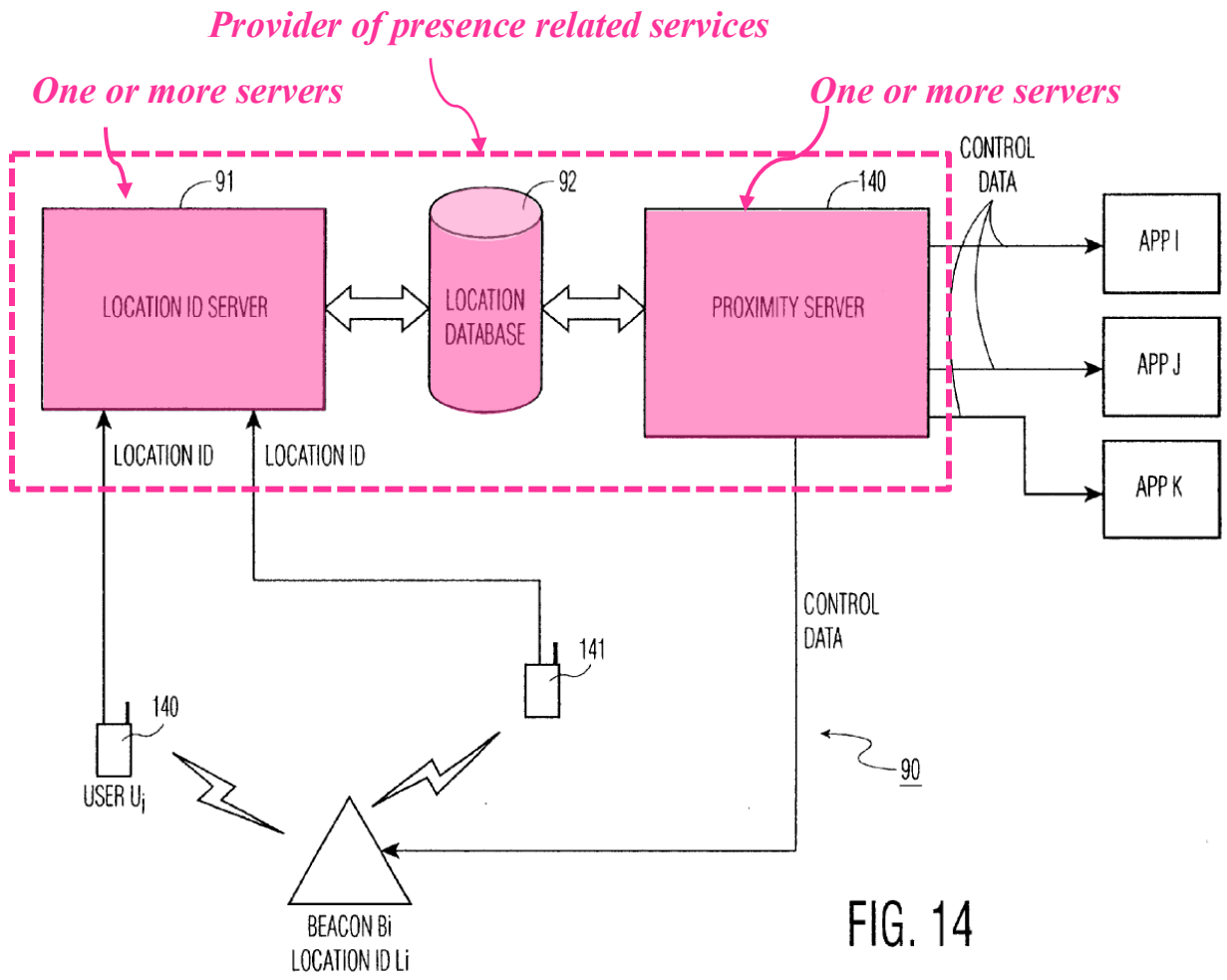
transmission range. Ex.1011, 3:16-22, 5:58-61, FIG. 5; Ex.1003 ¶120.

Rachabathuni's FIG. 5 shows the wireless device in the transmission range of the beacon B1 (*the first special area*). Ex.1003 ¶121.



Ex.1011, Detail of FIG. 5 (annotated)

Rachabathuni's location identification server 91 and proximity server 190 (*one or more servers*) modify the services provided to a wireless device based on the device's proximity to a location (*the provider of presence related services having one or more servers*). Ex.1003 ¶122.



Ex.1011, FIG. 14 (annotated)

[1.2]

Rachabathuni describes "a location identification server 91 that is coupled to a **location database 92**" (such that *the one or more servers* is *electronically storing* data). Ex.1011, 6:45-47. The "location identification server 91 **registers locations and user identities of users of wireless devices**" (*data capable of linking the mobile station to the first special area*) based on the notifications received from the devices, and *electronically stores* this location information in the

location database coupled to the location identification server (*electronically storing in the one or more servers*). Ex.1011, 6:45-50 ("location identification server 91 [] coupled to a location database 92"); 6:55-65 (explaining information stored by location identification server 91 in a database record), 7:20-29 ("server 91 updates the location database 92"). Rachabathuni teaches that the location database stores records including "**a user identity or identification field 102**" (*the data including…a first identifier related to the mobile station*), "**a location identification field 103**" (*the data including a checking data of the first radio communication defining device*), "and a date and time field 104 registering when the user was last encountered at a given location such as at a location of a wireless beacon." Ex.1011, 6:58-64. Rachabathuni's FIG. 10 shows an example table from the location database for storing such records with "user ID" (*first identifier*) and "location ID" (*checking data*) fields annotated. Ex.1003 ¶123.

100

	S.NO.	FIELD NAME	TYPE	EMPTY OK
101	1	RECORD NUMBER	NUMBER	NO
102	2	USER ID	NUMBER	NO
103	3	LOCATION ID	NUMBER	NO
104	4	LAST ENCOUNTERED	DATE	NO

FIG. 10

Ex.1011, FIG. 10 (annotated)

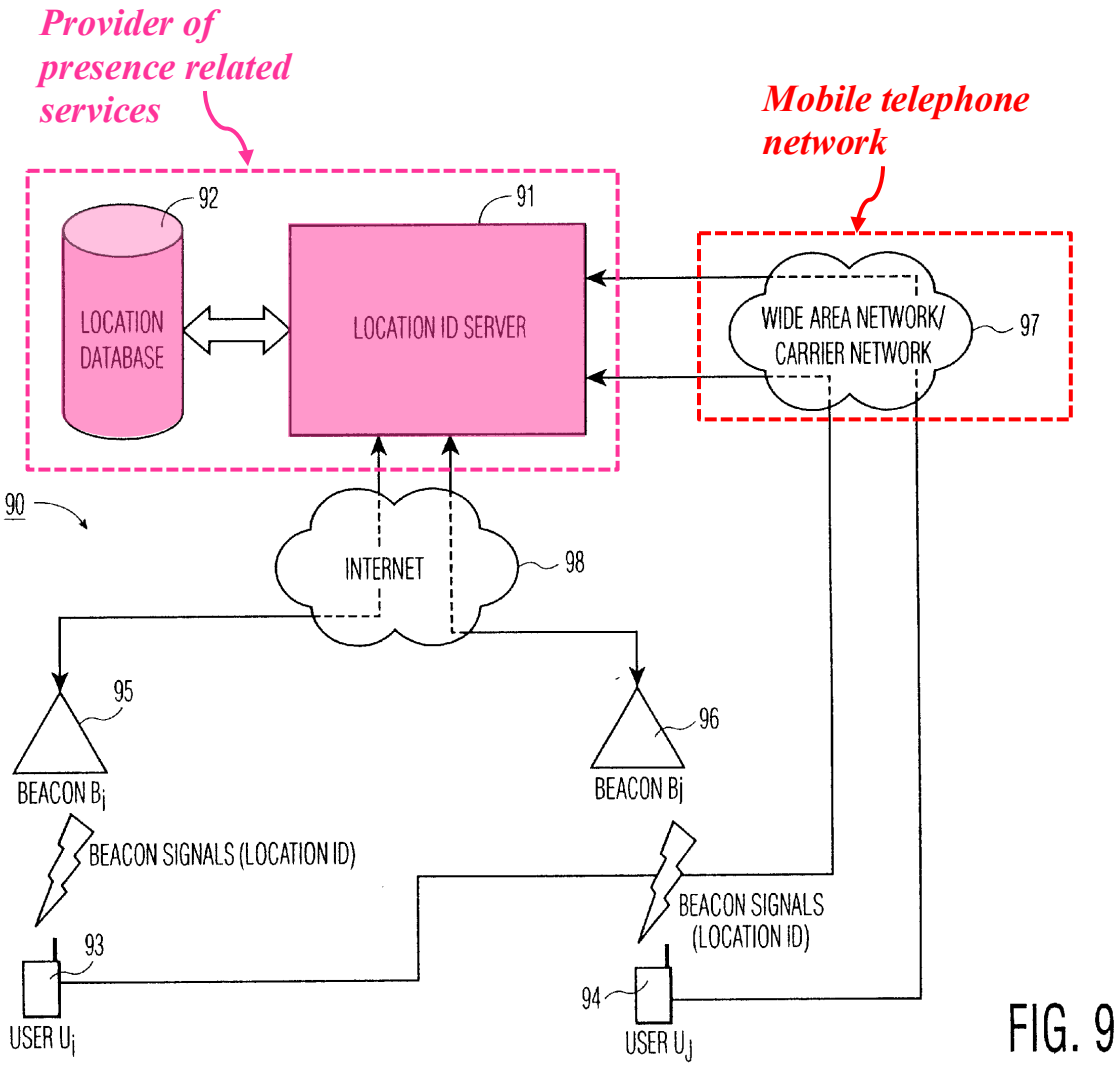
The location ID stored in Rachabathuni's database identifies a particular beacon and is received by a wireless device when it enters the range of that beacon. *See* Ex.1011, 7:63-65, FIG. 9 (showing "location ID" in the beacon signal sent by beacon 96). The '621 patent describes one example of the "*checking data*" recited in claim 1 as a "base station identification code." *See, e.g.*, Ex.1001, 4:5-7; 18:37-38. Rachabathuni's location ID is a "base station identification code" (and thus corresponds to "*checking data*") because both are (i) identifiers of network components (a "wireless beacon" and a "base station," respectively), (ii) included in signals broadcast by those network components over a coverage area, and (iii) used in their respective systems to indicate the presence of a mobile station in that coverage area. *See* Ex.1011, 6:58-64, 7:63-65, FIGS. 9-10; Ex.1001, Abstract, 2:39-42, 4:5-7; 18:37-38; Ex.1003 ¶124.

In addition, Rachabathuni renders obvious that the mobile station compares the location identifier received in the beacon signal against a stored identifier (*checking data*) in order to filter repetitive location updates (e.g., repeat updates including the same location identifier) from being sent to the location identification server. Ex.1011, 9:63-10:2 ("the wireless device is in a position to determine[e] which data is redundant to the location identification server"); Ex.1003 ¶124.

[1.3]

As Rachabathuni explains, wireless devices "are configured to communicate

with the location identification server 91 through wide area network or carrier network 97, that may be a cellular network." Ex.1011, 6:50-53. And wireless beacons are able to "contact the location identification server 91 through the Internet 98." Ex.1011, 6:53-55. As reflected in FIG 9, the location identification server 91 and location database are separate from and connected to both the cellular network and the Internet. Accordingly, while Rachabathuni's servers and databases, including location identification server 91 and location database (*the provider of presence related service*), are connected to the cellular network and the Internet, they are *different than the mobile telephone network*. Ex.1011, FIG. 9, Ex.1003 ¶125.



Ex.1011, FIG. 9 (annotated)

[1.4]

Rachabathuni describes that "when roaming, the users" of its system "encounter a succession of [wireless] beacons" by receiving the beacon signals broadcast by the wireless beacons. Ex.1011, 7:22-23. Upon receiving a beacon signal (including the location identifier of the beacon, *see* [1.4]), "[t]he wireless device 7" (*the mobile station*) "then acts as a bridge or relay to **pass beacon**

information" (*an updating signal*) "**to the location identification server 91**" (*receiving in the one or more servers of the provider of presence related services*). Ex.1011, 7:23-25. "Upon reception of passed beacon information, the server 91 updates the location database 92 so that the database 92 **reflects which wireless beacons wireless device have or had proximity to**." Ex.1011, 7:25-29; *see also* 9:35-37 (the "wireless device transmits location identification to the location identification server whenever it receives a new location identification from a wireless beacon"); Ex.1003 ¶126

The mechanisms Rachabathuni describes for the wireless device passing the beacon information to the location identification server (*e.g.*, acting as a "bridge or relay to pass beacon information," calling a "CGI (Common Gateway Interface) script that resides on the web server 121 that can be reached through the Internet," etc.) are all *uncorrelated to any mobile station phone call establishment* because they relate to data transmission between network components (the wireless device and the location identification server) and not to setting up a phone call. Ex.1011, 7:21-25, 7:60-8:6; Ex.1003 ¶127.

The passed beacon information (*the updating signal*) *identifies the mobile station's presence in at least the first special area* because it includes the "location identifier" of the wireless beacon that sent the beacon signal, which indicates the wireless device's (*mobile station's*) presence in the coverage area of that wireless

beacon (*the first special area*, *see* [1.1]). Ex.1011, 5:63-65, 6:47-50, 8:56-57, FIGS. 9, 14; *see* [1.4]; Ex.1003 ¶128.

Rachabathuni teaches that the wireless device (*mobile station*) transmits the beacon information to the location identification server "through [a] wide area network or carrier network 97, that may **be a cellular network**" (*receiving from the mobile station via the mobile telephone network*). Ex.1011, 6:50-53, FIG. 9; Ex.1003 ¶129.

[1.5]

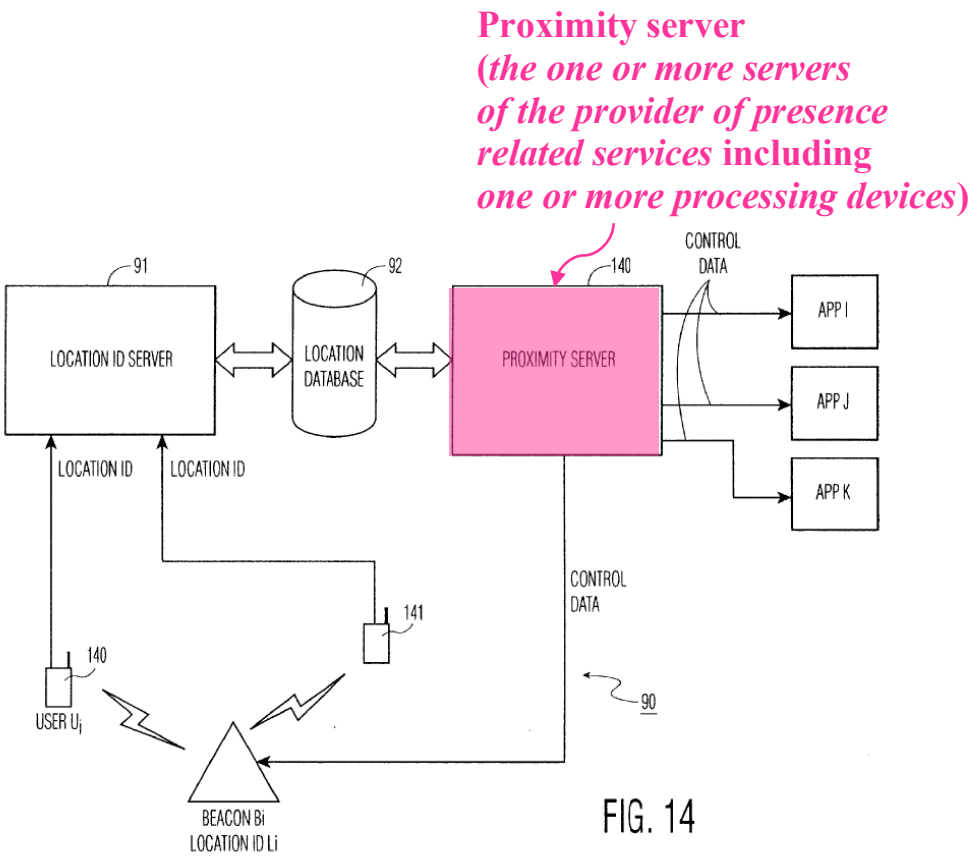
The location identification server and the proximity server are *processing devices* because they each "process[]" the received location information, as discussed in more detail below. Ex.1011, 9:37-40 ("The location identification server **processes** all location identifications it receives and stores them in the location database for use by other applications."), 8:60-63 (proximity server "**processes** [location information] to determine the proximity of users"); *see also* Ex.1040 ¶¶26, 66; Ex.1041 ¶31; Ex.1003 ¶130.

As previously discussed in [1.4], Rachabathuni teaches that "[u]pon reception of passed beacon information" (*the updating signal*), "the server 91 updates the location database 92 **so that the database 92 reflects which wireless beacons wireless device have or had proximity to**." Ex.1011, 7:25-29. The "proximity server" (*the one or more servers of the provider of presence related*

services) "uses the location information collected by the location identification server 91" (provided by *the updating signal*) "and **processes it to determine**" (*derive*) "the proximity of users to…locations" such as the wireless beacon (*whether or not the mobile station is present in the first special area*). Ex.1011, 8:60-63; Ex.1003 ¶131.

Further, Rachabathuni teaches that the proximity server (th*e one or more servers of the provider of presence related services*) "processes," and thus *has access to*, "the location information collected by the location identification server 91" (*the data capable of linking the mobile station to the first special area*, *see* [1.1]). Ex.1011, 8:60-63; Ex.1003 ¶131.

Rachabathuni's FIG. 14 shows the proximity server (*the one or more servers of the provider of presence related services* including *one or more processing devices*). Ex.1003 ¶132.

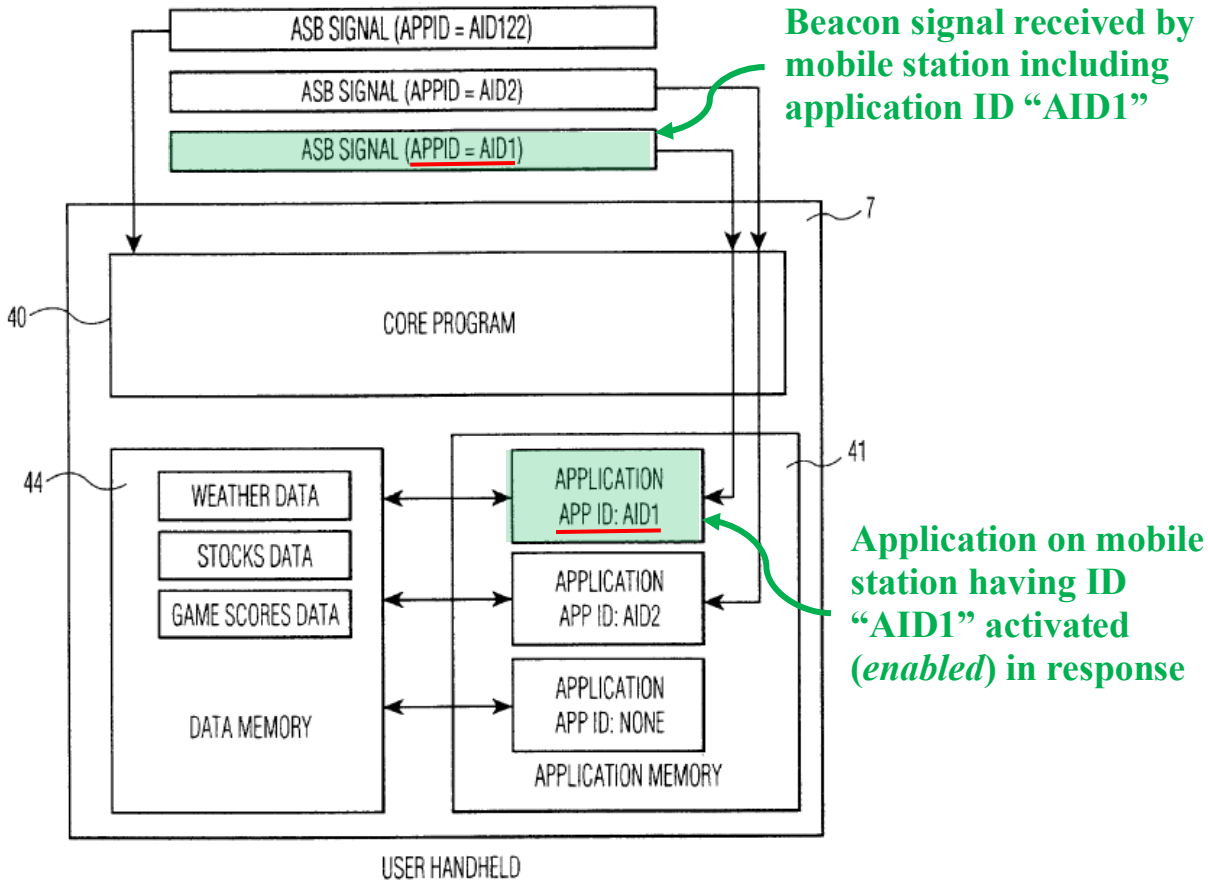


Ex.1011, FIG. 14 (annotated)

[1.6]

First, Rachabathuni teaches that the wireless beacons include "application specific identifier[s]" in beacon signals that, when received by the mobile station, cause applications on the mobile station (*presence related services*) associated with those identifiers to be "activated" (*enabl[ed]*) and applications not associated with those identifiers to not be activated (*disabl[ed]*). Ex.1011, 6:8-37; FIG. 7. Rachabathuni teaches that, upon receiving the beacon signal including an application specific identifier, the mobile station "activate[s]" an application

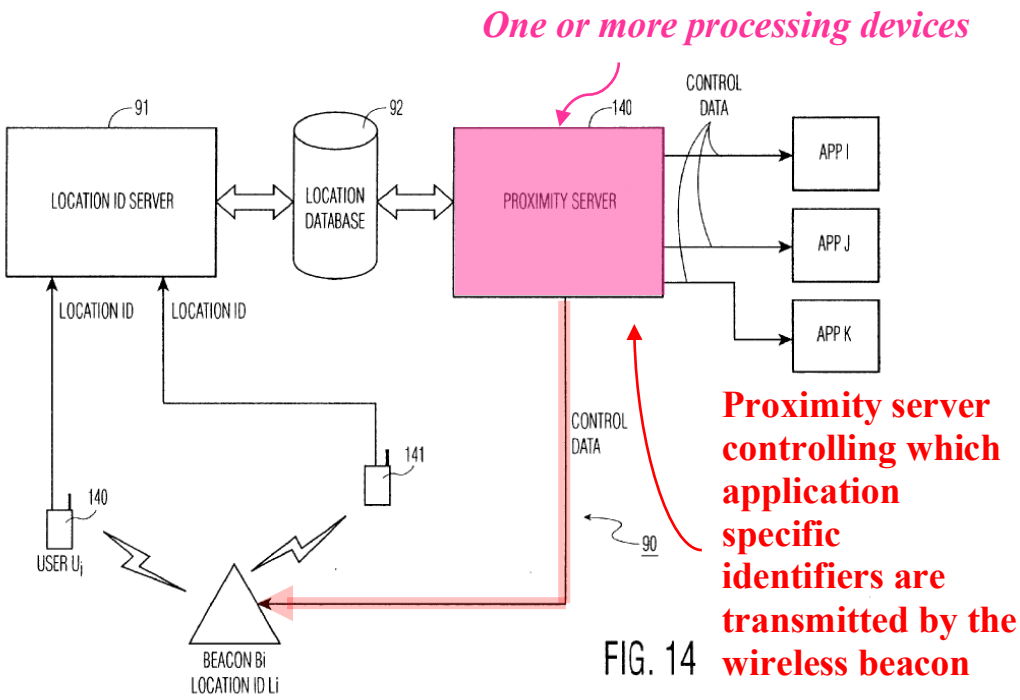
(*enable[es] a service*) associated with that application specific identifier. Ex.1011, 6:24-37. If the beacon signal does not include the application specific identifier for a particular application, the application is not activated (*disabl[ed]*). Ex.1011, 6:8-17; Ex.1003 ¶133. Rachabathuni's FIG. 7 shows this configuration:



Ex.1011, Detail of FIG. 7 (annotated)

Second, Rachabathuni teaches that the proximity server (including *one or more processing devices*, *see* [1.4]) controls the wireless beacons to set which "application specific identifier[s]" are included in the transmitted beacon signals,

and does so based on the mobile station's presence in the transmission range of a particular wireless beacon (*the first special area*). Ex.1011, Abstract, 3:15-20, 8:51-67, FIG. 14. Using this mechanism, the proximity server controls the "**selection of applications**" or "**services**" (*enabl[es] or disabl[es] presence related services*) based on the presence or non-presence of the wireless device (*mobile station*) in range of a particular wireless beacon (*in the first special area*). Ex.1011, Abstract, 8:51-67; *see also* 3:18-19 (the system "provid[es] a mechanism to relate services to users, such as location dependent services to a single user"). The proximity server "**modif[ies] the behavior of the system or parts of system based on the proximity of…users to locations**" (*e.g.*, particular wireless beacons). Ex.1011, 8:58-63. In the example shown in Rachabathuni FIG. 14 below, "**the proximity server 140 controls the wireless beacon 142 and selection of applications I, J, and K**" based on the presence of the wireless device. Ex.1011, 8:58-67; Ex.1003 ¶¶134-135:



Ex.1011, FIG. 14 (annotated)

3. Claim 4

As discussed in [1.6], Rachabathuni describes that the proximity server controls the selection of services provided to the mobile device by causing the wireless beacon to include or not include "application specific identifier[s]" in its transmitted beacon signal (*a signal to the mobile station that is capable of being used to enable or disable one or more related functions in the mobile station*). Ex.1011, Abstract, 8:58-67. Upon receiving the beacon signal, the mobile station "activate[s]" an application (*enable[es] a service*) associated with the application specific identifier in the beacon signal. Ex.1011, 6:24-36; Ex.1003 ¶136. If the

beacon signal does not include the application specific identifier for a particular application, the application is not activated (*disabl[ed]*). Ex.1011, 6:8-17; Ex.1003 ¶136.

Further, Rachabathuni explains that the proximity server communicates with the wireless beacon over a wide area network (WAN). Ex.1011, 5:2-4; *see also* 4:35-37, FIGs. 1-2. A POSTIA would have understood that a well-known example of a WAN was a cellular network. *See, e.g.*, Ex.1071 ¶8; Ex.1003 ¶137. Thus, Rachabathuni controls the selection of services through control data transmitted from the proximity server to the beacons via a WAN (*transmitting via the mobile telephone network a signal*) that is then passed to the mobile device (*to the mobile station*) to activate applications. Ex.1011, Abstract, 6:24-36, 8:58-67; Ex.1003 ¶137.

4. Claim 5

As discussed in [1.2], Rachabathuni describes "a location identification server 91 that is coupled to a location database 92" (*one or more servers of the provider of presence related services*). This location database stores records including "a location identification field 103" (*storing of the checking data in the one or more servers of the provider of presence related services*). Ex.1011, 6:58-64. Specifically, "**the wireless device 93 passes location** and user identity **information** to the location identification server 91 **for inclusion into the**

database 92." Ex.1011, 7:56-60. Thus, Rachabathuni teaches that the location identification server receives location information (*checking data*) transmitted from the wireless device via the cellular network for inclusion in the database (*electronically receiv[es] from the mobile station the checking data*). Ex.1011, 7:56-60; Ex.1003 ¶138.

5. Claim 6

As discussed in [1.1], Rachabathuni teaches that the wireless device transmits the beacon information to the location identification server "through [a] wide area network or carrier network 97, that may be **a cellular network**" (*the mobile telephone network is cellular*). Ex.1011, 6:50-53, FIG. 9; Ex.1003 ¶139.

6. Claim 7

Rachabathuni teaches that the mobile station may "filter" "the number [of] location identifications that are transmitted to the location identification server" by "**determining which data is redundant to the location identification server**." Ex.1011, 9:63-10:2. Thus, Rachabathuni teaches that the mobile station "determine[s]" its presence in the first special area (*e.g.*, whether it remains in an area about which it has already notified the location identification server) prior to sending the updating signal to "filter" out "redundant" signals. Ex.1011, 9:67-10:12; Ex.1003 ¶140. If the updating signal is not redundant and thus not filtered, it includes an indication of the new area the mobile station determines it has entered

(*the result of a previous determination performed by the mobile station about the mobile station's presence in the first special area*). Ex.1011, 9:67-10:12; Ex.1003 ¶140.

7. Claim 8

As discussed in [1.4], Rachabathuni teaches that the wireless device passes beacon information to the location identification server (*the one or more servers of the provider of presence related services*) via the cellular network. Ex.1011, 7:23-25; Ex.1003 ¶141. This occurs when the wireless device enters the range of the beacon (*at times recent to when the mobile station enters into or exits from the first special area*). Ex.1003 ¶141.

Further, Rachabathuni explains that "[i]n several situations the wireless device is in a position to determining which data is redundant to the location identification server" for purposes of limiting redundant beacon information passed to the server. Ex.1011, 9:67-10:2; Ex.1003 ¶142. "For instance, a user's wireless device may implement a simple filter that follows the rule '**transmit only once a minute**'" (*periodically*) such that transmissions do not occur too quickly as a device passes through wireless beacon ranges quickly. Ex.1011, 10:3-13; Ex.1003 ¶142. Rachabathuni's "transmit only once a minute" principle is also applied when the mobile station remains in the same location, meaning that beacon information is passed *when the mobile station remains in the first special area* for a time (*i.e.*,

one minute). Ex.1011, 10:3-13; Ex.1003 ¶142.

8. Claim 9

As discussed in [1.6], Rachabathuni describes the proximity server (part of *the provider of presence related services, see* [1.0]) reconfiguring wireless beacons to *enabl[e] or disabl[e]…service[s] depending on the presence of the mobile station in the first special area*. Ex.1003 ¶143. Further, Rachabathuni's teachings are not limited to services, but further relate to applications that would include *multimedia content*. Ex.1003 ¶143. For instance, Rachabathuni contemplates an implementation of applications where an HTML page is accessible based on proximity to wireless beacons, or specific maps or other information is provided to a mobile phone based on location. Ex.1011, 1:24-2:5; Ex.1003 ¶143.

In addition, Rachabathuni teaches that the message sent by the mobile station when it is in range of a beacon (*the updating signal*, *see* [1.5]) acts as *a request*, because the proximity server responds by configuring the wireless beacon to enable the appropriate applications (and corresponding *multimedia content*) for the mobile station in that particular location. *See* Ex.1011, 8:58-67, FIG. 14; Ex.1003 ¶144.

9. Claim 10

As discussed above in Ground 1, Claim 10 is substantially similar to claim 1, with differences addressed in the analysis below. *See* §XI.C.5; Ex.1064

(comparison); Ex.1003 ¶145.

[10.2]

Rachabathuni teaches "a proximity alert application" that sends proximity alerts to a user's wireless device from the location identification server (*transmitting to the mobile station from the one or more servers*) based on the presence of the user. Ex.1011, 8:15-50, FIG. 13; Ex.1003 ¶146. As reflected in FIG. 13, the location identification server 91, "upon receipt of new information, determines the proximity between the user and all the users and locations user expressed desired having alerted about." Ex.1011, 8:43-46. "If the application determines any of **the locations…are in the proximity of the user, the user is alerted**." Ex.1011, 8:46-48; Ex.1003 ¶146. These alerts contain *at least a portion of the checking data* because, as discussed in [1.2], *the checking data* includes "a **location identification field** 103" corresponding to a location of a beacon. Ex.1011, 6:58-64; Ex.1003 ¶146.

[10.3]

Limitation [10.3] is substantially similar to limitation [1.4], with the additional element of *the updating signal including the identifier or other identifier related to the mobile station*. Ex.1003 ¶147.

As discussed in [1.4] above, Rachabathuni describes that "upon reception of passed beacon information" (the *updating signal*, *see* [1.4]), "the server 91 updates

the location database 92 so that the database 92 reflects which wireless beacons wireless device have or had proximity to." Ex.1011, 7:25-29. The beacon information (*updating signal*) received by the location server from the wireless device includes "location and **user identity information**" (*e.g.*, the "user ID" shown in the database record in FIG. 10) "for inclusion into the database 92" (*including the identifier or other identifier related to the mobile station*). Ex.1011, 7:58-60; Ex.1003 ¶148.

10. Claims 13-18

Claims 13-18 are rendered obvious for the same reasons as discussed with respect to claims 4-9. *See* §XI.E.3-9; Ex.1064 (comparison); Ex.1003 ¶149.

F. Ground 4: Claims 2-3 and 11-12 are obvious under §103 over Rachabathuni and Granberg

1. Reasons to combine Rachabathuni and Granberg

A POSITA would have found it obvious to modify Rachabathuni's proximity server and location database based on the teachings of Granberg. Ex.1003 ¶151. In the combination, Rachabathuni's proximity server maintains information in the location database 91, including activating or deactivating a "network-specific indicator" associated with a particular service for a particular mobile station depending on the presence of the mobile station in a location where the particular service is configured to be provided to the particular mobile station, based on the teachings of Granberg. *See* Ex.1011, 8:58-67, FIGS. 10, 14; Ex.1037,

7:45-54; Ex.1003 ¶150.

As previously discussed, Granberg is analogous art. *See* §XI.D.2.

A POSITA would have been motivated to implement functionality with Rachabathuni's proximity server and location database to activate or deactivate a "network-specific indicator" associated with a "network-based service" for a particular mobile station depending on its presence, based on the teachings of Granberg. *See* Ex.1011, 8:58-67, FIGS. 10, 14; Ex.1037, 7:45-54; Ex.1003 ¶153. A POSITA would have recognized that maintaining "network-specific indicators," like those taught in Granberg, with Rachabathuni's location database would provide an easily comprehensible summary of the status of particular services for a particular mobile station based on its location in the form of a list of flags (one for each service) indicating whether each service is currently enabled or disabled. *See* Ex.1011, 8:58-67, FIGS. 10, 14; Ex.1037, 7:45-54; Ex.1003 ¶153. A POSITA would have recognized that such a status summary would benefit administrators of Rachabathuni's system by enabling them to easily determine which services were currently being provided to the mobile station in a particular location, thereby facilitating verification and troubleshooting of service configurations in Rachabathuni's system. *See* Ex.1011, 8:58-67, FIGS. 10, 14; Ex.1037, 7:45-54; Ex.1039, 16:38-42 (describing the utility of a "status table" for "troubleshooting" network services); Ex.1003 ¶153.

This modification to Rachabathuni represents a simple combination of prior art elements (Rachabathuni's service server with Granberg's service configuration functionality), according to known methods to yield predictable results (Rachabathuni's service server activating and deactivating services in the HLR based on the current network of the mobile station, as taught by Granberg). *KSR*, 550 U.S. at 416; Ex.1003 ¶154.

Further, a POSITA would have been motivated to implement functionality based on the Granberg's "service configuration" feature with Rachabathuni's proximity server to achieve the same benefits and improve Rachabathuni's system "in the same way" as the similar system of Granberg. *KSR*, 550 U.S. at 417 (finding obviousness when a known technique "would improve similar devices in the same way"); Ex.1003 ¶155.

A POSITA would have had a reasonable expectation of success in making such a combination because Granberg teaches a system operating in the proposed manner. Ex.1037, 6:3-15, 7:34-54. Ex.1003 ¶156. Indeed, the combination is nothing more than "the predictable use of prior art elements according to their established functions." *KSR*, 550 U.S. at 417.

2. Claim 2

As previously discussed in [1.4], Rachabathuni teaches that "[u]pon reception of passed beacon information" (*the updating signal*), the location

identification server 91 (including *one or more processing devices*) "**updates the location database 92**" (*a database of the provider of presence related services*) "so that the database 92 **reflects which wireless beacons wireless device have or had proximity to**" (*updat[es]* the database *depending on the presence of the mobile station in the first special area*). Ex.1011, 7:25-29; Ex.1003 ¶157.

In the combination, Granberg teaches a database including "one or more **network-specific indicators**" (*operating parameters*) "*e.g.*, one or more flags, corresponding to one or more network-specific services." Ex.1037, 7:45-48. "Each network-specific indicator is then **set or activated when that subscriber**" (*e.g.*, the mobile station) "**is to receive a corresponding network-based service**," such as when the mobile station is the first special area as taught by Rachabathuni. Ex.1037, 7:49-53; Ex.1011, 6:58-64, FIG. 10. Or, "[i]f that subscriber" (the mobile station) "**is not to receive the service**" at the particular location, "**the flag is reset or otherwise deactivated**." Ex.1037, 7:53-54; Ex.1011, 6:58-64, FIG. 10; Ex.1003 ¶158.

Accordingly, in the combination, the location database of Rachabathuni includes an *operating parameter* in the form a flag corresponding to a service (*a service flag*) that is either "set"/"activated" or "reset"/"deactivated" (*update[d]*), as taught by Granberg, based on the location of the mobile station. Ex.1037, 7:53-54; Ex.1011, 6:58-64, FIG. 10; Ex.1003 ¶159.

3. Claim 3

As previously discussed in [2.0], Granberg teaches a database including "one or more network-specific indicators" (*operating parameters*) "*e.g.*, **one or more flags, corresponding to one or more network-specific services**" (*a service flag*). Ex.1037, 7:45-48. "Each network-specific indicator is then **set or activated when that subscriber**" (the mobile station) "**is to receive a corresponding network-based service**," such as when the mobile station is the first special area as taught by Rachabathuni. Ex.1037, 7:49-53; Ex.1011, 6:58-64, FIG. 10. Or, "[i]f that subscriber" (the mobile station) "**is not to receive the service**" at the particular location, "**the flag is reset or otherwise deactivated**." Ex.1037, 7:53-54; Ex.1011, 6:58-64, FIG. 10; Ex.1003 ¶160.

Accordingly, in the combination, the location database of Rachabathuni includes an *operating parameter* in the form a flag corresponding to a service (*a service flag*) that is either "set"/"activated" or "reset"/"deactivated" (*update[d]*), as taught by Granberg, based on the location of the mobile station. Ex.1037, 7:53-54; Ex.1011, 6:58-64, FIG. 10; Ex.1003 ¶161.

4. Claims 11-12

Claims 11-12 are rendered obvious for the same reasons as discussed with respect to claims 2-3. *See* §XI.F.2-3; Ex.1064 (comparison); Ex.1003 ¶162.

XII. CONCLUSION

Petitioner has established a reasonable likelihood that the Challenged Claims are unpatentable.

Respectfully submitted,

Dated: September 11, 2025
HAYNES AND BOONE, LLP
2801 N. Harwood Ave, Ste 2300
Dallas, Texas 75201
Customer No. 27683

/Scott T. Jarratt/
Scott T. Jarratt
Lead Counsel for Petitioner
Registration No. 70,297

XIII. MANDATORY NOTICES

A. Real party-in-interest

Pursuant to 37 C.F.R. §42.8(b)(1), Petitioner certifies that the real party-in-interest is Apple Inc.

B. Related matters

Pursuant to 37 C.F.R. §42.8(b)(2), to the best knowledge of the Petitioner, the '621 patent is or was involved in the following cases:

Case Heading	Number	Court	Filed
Avant Location Technologies LLC v. Apple Inc.	2-24-cv-00757	EDTX	Sept. 13, 2024
Avant Location Technologies LLC v. Fibar Group SA et al.	2-24-cv-00165	EDTX	March 8, 2024
Avant Location Technologies LLC v. Samsung Electronics Co., Ltd. Et al.	2-24-cv-00133	EDTX	Feb. 23, 2024
Avant Location Technologies LLC v. Ecobee Technologies ULC d/b/a Ecobee	2-23-cv-00354	EDTX	July 31, 2023

C. Lead and back-up counsel and service information

Lead Counsel
Scott T. Jarratt
HAYNES AND BOONE, LLP
2801 N. Harwood Ave, Ste 2300
Dallas, TX 75201

Phone: (972) 739-8663
Fax: (214) 200-0853
scott.jarratt.ipr@haynesboone.com
USPTO Reg. No. 70,297

Back-up Counsel

Adam C. Fowles
HAYNES AND BOONE, LLP
2801 N. Harwood Ave, Ste 2300
Dallas, TX 75201
Phone: (214) 739-8674
Fax: (214) 200-0853
adam.fowles.ipr@haynesboone.com
USPTO Reg. No. 65,005

Jonathan Bowser
HAYNES AND BOONE, LLP
2801 N. Harwood Ave, Ste 2300
Dallas, TX 75201
Phone: (202) 654-4503
Fax: (202) 654-4278
jon.bowser.ipr@haynesboone.com
USPTO Reg. No. 54,574

Dan Smith
HAYNES AND BOONE, LLP
2801 N. Harwood Ave, Ste 2300
Dallas, TX 75201
Phone: (972) 739-8634
Fax: (214) 200-0853
dan.smith.ipr@haynesboone.com
USPTO Reg. No. 71,278

Matthew Beck
HAYNES AND BOONE, LLP
2801 N. Harwood Ave, Ste 2300
Dallas, TX 75201
Phone: (202) 654-4573
Fax: (202) 654-4278
matthew.beck.ipr@haynesboone.com
USPTO Reg. No. 79,791

Please address all correspondence in this proceeding to lead and back-up counsel. Petitioner consents to service in this proceeding by email at the addresses above.

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), Petitioner hereby certifies, in accordance with and reliance on the word count provided by the word-processing system used to prepare this Petition, that the number of words in this paper is 13,947. Pursuant to 37 C.F.R. § 42.24(d), this word count excludes the table of contents, table of authorities, mandatory notices under § 42.8, certificate of service, certificate of word count, appendix of exhibits, and any claim listing.

Dated: September 11, 2025

/Scott T. Jarratt/
Scott T. Jarratt
Lead Counsel for Petitioner
Registration No. 70,297

CERTIFICATE OF SERVICE

The undersigned certifies that, in accordance with 37 C.F.R. § 42.6(e) and 37 C.F.R. § 42.105, service was made on Patent Owner as detailed below.

Date of service	September 11, 2025
Manner of service	FEDERAL EXPRESS
Documents served	Petition for *Inter Partes* Review Under 35 U.S.C. § 312 and 37 C.F.R. § 42.104 of U.S. 9,485,621; Petitioner's Power of Attorney; Petitioner's Exhibit List; Exhibits 1001-1006, 1011, 1018-1019, 1021, 1037, 1039-1042, 1064, 1071, and 1073-1074.
Persons served	Edell, Shapiro & Finnan, LLC 9801 Washingtonian Blvd., Suite 750 Gaithersburg, MD 20878

/ Scott T. Jarratt/
Scott T. Jarratt
Lead Counsel for Petitioner
Registration No. 70,297