

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner

IPR2025-01259
U.S. Patent No. 10,009,720

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

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PETITIONER’S EXHIBIT LIST

Ex.1001	U.S. Patent No. 10,009,720
Ex.1002	Prosecution History of U.S. Patent No. 10,009,720
Ex.1003	Declaration of Dr. R. Michael Buehrer under 37 C.F.R. § 1.68
Ex.1004	<i>Curriculum Vitae</i> of Dr. R. Michael Buehrer
Ex.1005	U.S. Patent No. 8,615,256 (“Putkiranta”)
Ex.1006	U.S. Pub. No. 2006/0135174 (“Kraufvelin”)
Ex.1007 to Ex.1008	RESERVED
Ex.1009	U.S. Patent No. 5,295,180 (“Vendetti”)
Ex.1010	PCT Pub. No. WO2000/27152 (“Vimpari”)
Ex.1011 to Ex.1015	RESERVED
Ex.1016	U.S. Pub. No. 2004/0203863 (“Huomo”)
Ex.1017	RESERVED
Ex.1018	3GPP TS 23.171, version 3.10.0 (Jun. 2003)
Ex.1019	3GPP TS 23.171, version 1.0.0 (Oct. 1999)
Ex.1020	RESERVED
Ex.1021	3GPP TS 23.032, version 3.0.0 (May 1999)
Ex.1022 to Ex.1036	RESERVED
Ex.1037	U.S. Patent No. 6,122,510 (“Granberg”)
Ex.1038 to Ex.1044	RESERVED

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Ex.1045	U.S. Patent No. 6,324,404 (“Dennison”)
Ex.1046	U.S. Pub. No. 2008/0132233 (“Li”)
Ex.1047 to Ex.1050	RESERVED
Ex.1051	U.S. 10,009,720 Preliminary Infringement Contentions; <i>Avant Location Technologies LLC v. Apple Inc.</i> , 2-24-cv-00757 (EDTX).
Ex.1052	Jeff Rutenbeck, Tech Terms: What Every Telecommunications and Digital Media Professional Should Know, (2006)
Ex.1053	Wiley Electrical and Electronics Engineering Dictionary, (2004)
Ex.1054	Microsoft Computer Dictionary (5th ed. 2002)
Ex.1055	Dictionary of Computer Science, Facts on File (Rev. ed. 2006)
Ex.1056	A Dictionary of Computing (5th ed. 2004)
Ex.1057	Dictionary of Computer and Internet Terms (9th ed. 2006)
Ex.1058	Newton’s Telecom Dictionary (22nd ed. 2006)
Ex.1059	McGraw-Hill Illustrated Telecom Dictionary (4th ed. 2001)
Ex.1060	Hargrave’s Communications Dictionary (2001)

CLAIM LISTING

Claim 1	
[1.0]	A method associated with the use of a mobile station and a radio communication defining device that transmits a distinctive defining signal, the method comprising:
[1.1]	receiving and processing the distinctive defining signal in the mobile station;
[1.2]	the distinctive defining signal at least defining a special area by one or more of: (1) a coverage area of the distinctive defining signal; (2) a portion of the coverage area that intersects with another area of coverage of another radio communication defining device; and (3) a sum of the area of coverage and the another area of coverage;
[1.3]	the distinctive defining signal including information indicating whether or not the radio communication defining device is in a predetermined environment; and
[1.4]	sending from the mobile station via a mobile telephone network the updating signal to one or more servers of a provider of presence related services about the mobile station's presence in the special area,
[1.5]	the updating signal being useable by the one or more servers of the provider of presence related services to adjust an operating parameter, which comprises one or more of a tariff and a service flag, to adjust, activate, or deactivate the presence related services provided to the mobile station, and
[1.6]	the updating signal comprising the information indicative of whether or not the radio communication defining device is located in the predetermined environment.
Claim 2	
Claim 2	The method according to claim 1, wherein the sending of the updating signal is uncorrelated to any mobile station phone call establishment, the updating signal being sent at least one of (i) periodically, (ii) at times recent to when the mobile station enters into or exists from the special area, and (iii) when the mobile station remains in the special area.
Claim 4	

Claim 4	The method according to claim 1, wherein the frequency of the updating signal is different from the frequency of the distinctive defining signal.
Claim 5	
Claim 5	The method according to claim 1, wherein the predetermined environment comprises one or more of: (1) one or more specific geographic locations; (2) a physical environment; (3) an environment defined by an operator of the mobile telephone network; and (4) an area defined by a fixed network.
Claim 6	
Claim 6	The method according to claim 1, wherein the distinctive defining signal comprises a signal with a frequency that is outside a frequency range allocated for the mobile telephone network.
Claim 7	
[7.0]	A method comprising:
[7.1]	wirelessly receiving, in a radio communication defining device, first information from a radio transmitting device;
[7.2]	the radio communication defining device using the first information to determine whether or not the radio communication defining device is in a predetermined environment;
[7.3]	transmitting from the radio communication defining device to a mobile station a distinctive defining signal that at least defines a special area by one or more of: (1) a coverage area of the distinctive defining signal; (2) a portion of the coverage area that intersects with another coverage area of another radio communication defining device; and (3) a sum of the area of coverage and the another area of coverage; and
[7.4]	wherein the distinctive defining signal includes second information indicating whether or not the radio communication defining device is located in a predetermined environment and
[7.5]	the second information allowing the mobile station to generate an updating signal that enables presence related services for the mobile station to be adjusted based on one or more of tariffs and service flags generated based on the updating signal.
Claim 9	

Claim 9	The method according to claim 7, wherein the distinctive defining signal is coded.
Claim 10	
Claim 10	The method according to claim 7, wherein the predetermined environment comprises one or more of: (1) one or more specific geographic locations; (2) a physical environment; (3) an environment defined by an operator of a mobile telephone network associated with the mobile station; and (4) an area defined by a fixed network.
Claim 11	
Claim 11	The method according to claim 7, wherein the distinctive defining signal comprises a signal with a frequency that is outside a frequency range allocated for a mobile telephone network associated with the mobile station.
Claim 12	
[12.0]	A method comprising:
[12.1]	receiving first information in a radio communication defining device via communication with a fixed network to which the radio communication defining device is physically connected;
[12.2]	the radio communication defining device using the first information to determine whether or not the radio communication defining device is in a predetermined environment; and
[12.3]	transmitting from the radio communication defining device to a mobile station a distinctive defining signal that at least partially defines a special area by one or more of: (1) a coverage area of the distinctive defining signal; (2) a portion of the coverage area that intersects with another coverage area of another radio communication defining device; and (3) a sum of the coverage area and the another coverage area,
[12.4]	wherein the distinctive defining signal includes second information indicating whether or not the radio communication defining device is located in a predetermined environment and
[12.5]	the second information allowing the mobile station to generate an updating signal that enables presence related services for the mobile station to be adjusted based on one or more of tariffs and service flags generated based on the updating signal.

Claim 14	
Claim 14	The method according to claim 12, further comprising storing in a memory of the radio communication defining device one or more parameters useable to authenticate the radio communication defining device in the fixed network.
Claim 15	
Claim 15	The method according to claim 12, wherein the predetermined environment comprises one or more of: (1) one or more specific geographic locations; (2) a physical environment; (3) an environment defined by an operator of a mobile telephone network associated with the mobile station; and (4) an area defined by the fixed network.
Claim 16	
Claim 16	The method according to claim 12, wherein the distinctive defining signal comprises a signal with a frequency that is outside a frequency range allocated for a mobile telephone network associated with the mobile station.

I. INTRODUCTION

U.S. Patent 10,009,720 (the “’720 patent,” Ex.1001) relates to systems and methods of providing location-based tariffs and services to mobile devices. The claims of the ’720 patent recite different ways of defining “special areas,” where certain tariffs and services may be activated or deactivated based on a mobile device’s presence in these special areas. The ’720 patent was allowed based on the way a “distinctive defining signal” defined the boundaries of the special areas and using “one or more of a tariff and a service flag” to activate or deactivate services based on the mobile device’s presence in the special area. But both these features—defining boundaries of particular areas and using flags to activate and deactivate tariffs and services—were known in the art prior to the ’720 patent. There is nothing new or nonobvious about the ’720 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 1-2, 4-7, 9-12, and 14-16 (the “Challenged Claims”) of the ’720 patent.

II. GROUNDS FOR STANDING

Petitioner certifies the ’720 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 the 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 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 ¶31. 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; Ex.1003 ¶31.

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 ’720 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 ¶32.

V. SUMMARY OF THE ’720 PATENT

The ’720 patent relates to a system and method for monitoring a mobile station’s presence in a special area to provide location-dependent rates or services. Ex.1001, [54], Abstract, 4:29-34. The claims are directed to a “radio communication defining device,” such as a base station of a mobile telephone network or wireless device, that transmits a “distinctive defining signal” to define a special area. Ex.1001, claim 1, 6:16-28, 7:42-51.

The claims recite different ways the distinctive defining signal may define a special area, including (1) the special area corresponding to the coverage area of the distinctive defining signal; (2) the special area corresponding to an intersection of coverage areas by two radio communication defining devices; and (3) the special area corresponding to the sum of coverage areas of multiple radio communication defining devices. Ex.1001, claim 1, 9:60-67, 12:8-11, 15:66-16:8. Figure 1 shows one example of the claimed “special area,” where base stations 105 transmit a “distinctive defining signal” having a “radio coverage 104.” Ex.1001, 6:22-24, 32-35, 48-55.

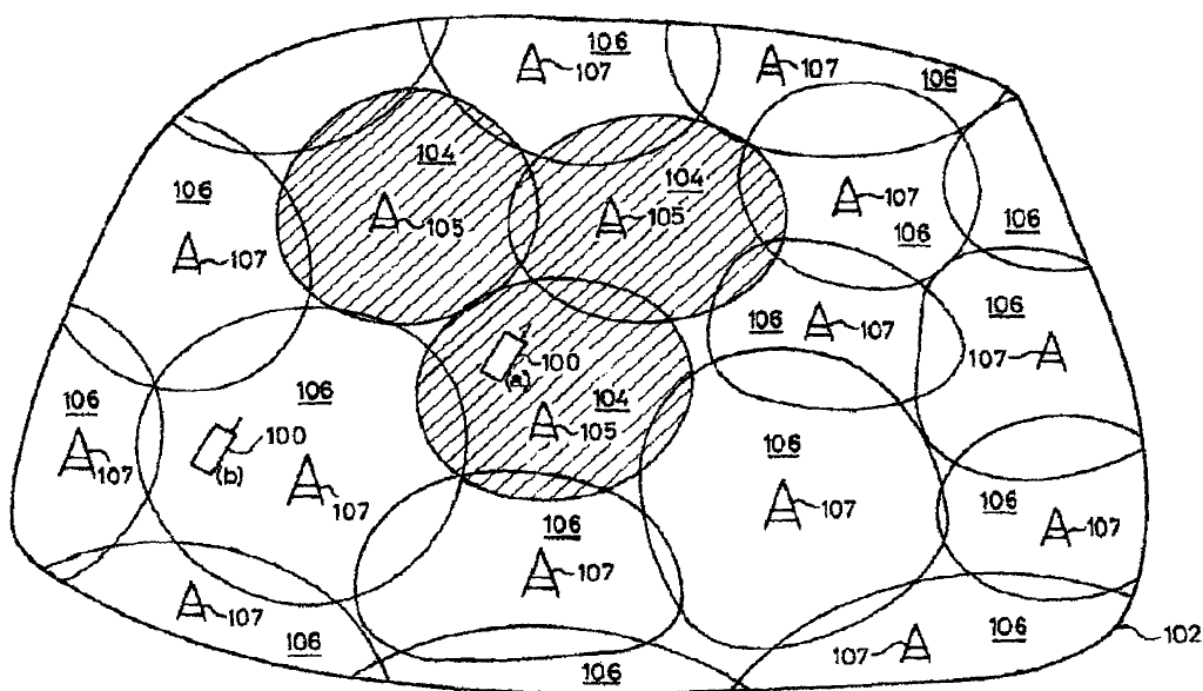


FIG. 1

Ex.1001, FIG 1.

As shown in Figure 1, “the sum of the coverage areas of the[] selected base stations 105 defines a special area (the shaded area of FIG. 1).” Ex.1001, 6:16-28. The claims also specify that the recited distinctive defining signal includes “information indicating whether or not the radio communication defining device is in a predetermined environment.” Ex.1001, claim 1. The specification refers to this information as “reliable information” indicating whether or not a wireless device is in a predetermined environment. Ex.1001, 5:34-40, 7:56-59, 8:9-14, 8:32-41, 8:52-64, 9:39-41, 15:51-58, 18:45-56. The specification does not, however, explain

what the “reliable information” may be. *See* Ex.1001, 5:34-41, 7:56-59, 8:9-14, 8:32-41, 8:52-64, 9:39-41, 15:51-58, 18:45-56.

A mobile station within the special area receives the distinctive defining signal and sends an “updating signal” to a “provider of presence related services,” such as a mobile telephone network operator or different provider. Ex.1001, claim 1, 15:51-58, 2:36-38, 4:35-43. The updating signal also includes “information indicating whether or not the radio communication defining device is in the predetermined environment.” Ex.1001, claim 1. The specification explains that this information is “reliable information related to whether or not the wireless device 212 or 212b is or not effectively located into its predetermined environment.” Ex.1001, 9:56-59. The provider can “adjust, activate, or deactivate” tariffs or services based on the mobile station’s presence in a special area. Ex.1001, claim 1, 2:39-52, 4:13-28, 12:12-35; Ex.1003 ¶¶33-39.

VI. PROSECUTION HISTORY

The ’720 patent (filed June 12, 2015) is a continuation of a line of patents, which are all continuations of PCT/EP2007/052939. Ex.1002, 578. The claims of the ’720 patent were allowed after an Examiner’s Amendment adding “the distinctive defining signal at least defining a special area by one or more of: (1) a coverage area of the distinctive defining signal; (2) a portion of the coverage area that intersects with another area of coverage of another radio communication”

defining device; and (3) a sum of the area of coverage and the another area of coverage, the distinctive defining signal including information indicating whether or not the radio communication defining device is in a predetermined environment” and “which comprises one or more of a tariff and a service flag, to adjust, activate, or deactivate the presence related services provided to the mobile station” to then pending claim 14, now claim 1. Ex.1002, 57-59, 52. Similar subject matter was added to the pending claims which became issued claims 7 and 12. Ex.1002, 60-62, 52.

VII. PRIORITY DATE OF THE '720 PATENT

The '720 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 '720 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 '720 patent (March 28, 2006) would have been knowledgeable and familiar with the use of location determination in the provision of location-

based services in a wireless communications network (e.g., a cellular telephone network or Wi-Fi network). Such a POSITA would have had a bachelor's degree in electrical engineering, computer science, computer engineering, or a related field, and two years of 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 ¶¶24-26.

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); Ex.1003 ¶40.

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 claims 1-2, 4-7, 9-12, and 14-16 of the '720 patent, of which claims 1-2 and 4-6 are asserted in the co-pending litigation.

B. Statutory grounds for challenges

Grounds	Claims	Basis (pre-AIA §103)
#1	1, 2, 5, 7, 9-10, 12, and 15	Vendetti and Granberg
#2	2	Vendetti, Granberg, and Kraufvelin
#3	4, 6, 11, and 16	Vendetti, Granberg, and Huomo
#4	14	Vendetti, Granberg, and Vimpari

U.S. Patent 5,295,180 (Ex.1009, “**Vendetti**”), issued on March 15, 1994, is prior art under §102(b).

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

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

U.S. Publication 2004/0203863 (Ex.1016, “**Huomo**”), filed June 28, 2002, and published October 14, 2004, is prior art at least under §§102(a), (b), and (e).

International Publication WO 00/27152 (Ex.1010, “**Vimpari**”), filed on October 29, 1999, in English, designating the U.S. and published on May 11, 2000, is prior art under §§102(a)-(b).

C. Ground 1: Claims 1, 2, 5, 7, 9-10, 12, and 15 are obvious over Vendetti and Granberg.

1. Vendetti

Vendetti relates to “a system for dividing a cellular telephone service area into a plurality of zones.” Ex.1009, 1:5-9. The zones allow a user to be “billed according to a rate schedule set for that particular zone.” Ex.1009, 4:43-46.

Vendetti generally discloses “marker transmitters” used to designate particular zones in a cellular service area. For example, Figure 3 shows a pair of marker transmitters M_1 and M_2 that define zones Z_1 and Z_2 . Ex.1009, 5:14-19.

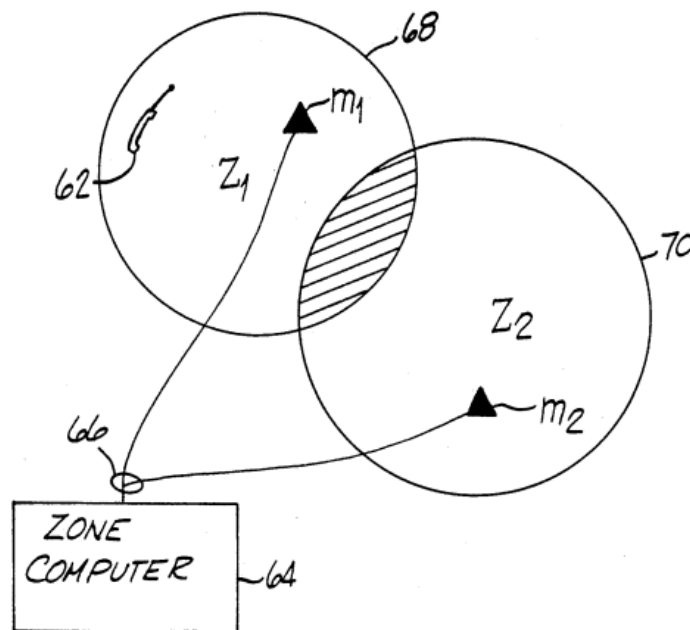


FIG. 3

Ex.1009, FIG. 3.

The marker transmitters transmit “marker signals,” which “allow the mobile

unit 62 to determine whether the unit is within a particular zone.” Ex.1009, 5:15-

23. The marker signals may include information such as a “zone identification signal” and a “dynamically changing” “password” that is unique to the zone for a specific time period. Ex.1009, 7:20-53, 9:50-58.

When a mobile unit is within a particular zone, it “receives the zone identification signals for the particular” zones, as well as the “variable password.” Ex.1009, 3:1-6, 3:27-33. The mobile unit “transmits the received zone identification signal and the password for the zone” to a mobile telephone switching office (MTSO). Ex.1009, 7:63-8:1, 11:66-12:2. Using the received information, the MTSO verifies that the mobile unit is in a particular zone by comparing “the password received from the mobile unit” with “the password transmitted by the marker transmitters.” Ex.1009, 3:29-33, 8:1-7. “If the passwords are the same, the cellular service provider can be confident that the mobile unit is within a particular zone.” Ex.1009, 3:33-35.

The zones allow a user to be “billed according to a rate schedule set for that particular zone.” Ex.1009, 4:43-46. For example, when a mobile unit is “in the primary zone,” “the user is billed for the call at a rate set for that particular zone,” such as at a discount. Ex.1009, 4:53-59. If the unit is in a “secondary zone,” the user is “billed at a ‘secondary zone’ rate,” and a “public zone” rate if the user is in a “public zone.” Ex.1009, 4:67-5:7; Ex.1003 ¶¶44-47.

2. Granberg

Granberg describes a “mobile communications network 10” that includes a “database that stores and manages subscriptions” for a number of subscriber devices (e.g., cell phones). Ex.1037, 5:38-40, 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 further 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, 7:44-48. “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 ¶48.

Granberg explains that “when a mobile station enters into a visiting location or service area,” a request is sent for data about the roaming mobile station from the mobile’s home location register (HLR), which triggers the HLR’s updating of the “network-specific indicators” to activate or deactivate “network-based services” as appropriate for the particular network where the mobile station is operating within. Ex.1037, 5:61-64, 7:34-54, 8:11-22; Ex.1003 ¶49.

3. Reasons to combine Vendetti and Granberg

A POSITA would have been motivated to combine the teachings of Vendetti and Granberg for several reasons. Ex.1003 ¶50. Combining Granberg's implementation details for adjusting a flag to activate or deactivate services for a mobile device with Vendetti's system, which charges a user different tariff rates based on location, would have been obvious, beneficial, and predictable. Vendetti describes charging a user different rates based on location, but leaves implementation details up to a POSITA, motivating a POSITA to turn to Granberg's well-known flag-setting techniques. Additionally, combining Granberg's teaching of a service flag with Vendetti's system that teaches location-based rates would be obvious, beneficial, and predictable because it expands the application and usefulness of Vendetti's zone-marking system. Ex.1003 ¶50.

As a threshold matter, Vendetti and Granberg are analogous art to the '720 patent. The '720 patent relates to a system and method for monitoring the presence of a mobile station in particular geographic areas. Ex.1001, (54), Abstract, 11:30-33, 12:12-35. Vendetti and Granberg are within the same field of endeavor. Like the '720 patent, Vendetti and Granberg are both systems and methods directed to monitoring the location of a mobile device. Ex.1009, 4:30-5:13, 7:51-8:7; Ex.1037, 1:20-23, Abstract; Ex.1003 ¶¶51-52.

Furthermore, Vendetti and Granberg are reasonably pertinent to problems

addressed in the '720 patent. The '720 patent states that one of the problems it was facing was avoiding fraud while providing location-based tariffs and services.

Ex.1001, 3:48-60, 4:12-34. Vendetti similarly provides a solution for avoiding fraud while providing location-based tariff rates for calls. Ex.1009, 3:27-37, 7:51-8:11. Granberg also provides a solution that overcomes problems associated with supplying location-based services. Granberg discloses using databases with flags to “more efficiently store information for network-specific supplementary services for large numbers of mobile subscribers” and “efficiently administer and update network-specific supplementary services for large numbers of mobile subscribers.” Ex.1037, 3:58-63; Ex.1003 ¶¶53-54.

Although Vendetti generally discloses billing a user a particular rate based on the user’s location in a specific zone, Vendetti leaves up to a POSITA details on how to implement these rate changes. A POSITA would have known that a database storing service profiles with flags to activate and deactivate services is a straightforward way to implement Vendetti’s rate changes based on location.

Ex.1003 ¶56. Granberg provides examples of these well-known database structures, e.g. storing “network-specific indicators, e.g., one or more flags, corresponding to one or more network-specific services” that are “set or activated” when the mobile station is supposed to receive that service or “reset or otherwise deactivated.” Ex.1037, 7:44-54. A POSITA would have been motivated to

implement Granberg’s database technique with Vendetti’s teachings to similarly gain the efficiency benefits described in Granberg—*e.g.*, to “more efficiently store information for network-specific supplementary services for large numbers of mobile subscribers.” Ex.1037, 3:58-63; Ex.1003 ¶56; *see also KSR Int’l v. Teleflex Inc.*, 550 U.S. 398, 417 (2007) (finding obviousness when a known technique “would improve similar devices in the same way”).

A POSITA would have had a reasonable expectation of success using Granberg’s flag-setting teachings with Vendetti’s system teachings. Ex.1003 ¶57. Vendetti teaches charging different rates depending on what zone the mobile station is in. *See, e.g.*, Ex.1009, 4:43-46, 4:53-59, 4:67-5:7. Granberg’s flag-setting teachings provide an efficient way of administering and updating services for a large number of mobile subscribers regardless of the mobile device’s location. Ex.1037, Abstract, 3:58-63, 4:10-29, 5:61-64, 6:3-15, 7:44-54; Ex.1003 ¶57. Granberg achieves this by providing a well-understood, standardized way to store and manage such profiles, including fields for flags regarding network-specific services. Ex.1037, 4:10-29, 6:3-15, 7:44-54. Granberg teaches doing so to provide information regarding the mobile station’s configured services when visiting different network areas. Ex.1037, 5:61-64; Ex.1003 ¶57.

Applying Granberg’s database teachings is simply a practical and conventional way to implement profile management functionality with Vendetti’s

location-based rate teachings. Both references operate within the context of cellular networks and maintain some sort of subscriber profile for a user. Ex.1009, 5:26-29; Ex.1037, 7:39-54. In such networks, subscriber profiles are routinely maintained in structured databases—thus, they are compatible. Ex.1003 ¶58. The use of a database structure like Granberg’s to store location-based service data is a predictable and routine implementation detail for any system that manages per-user, location-dependent tariffs, like Vendetti. Ex.1003 ¶58.

Moreover, implementing Granberg’s database-structure teachings with Vendetti’s teachings of charging users different rates is a mere design choice that leverages established database practices for managing subscriber data in telecommunications networks. Ex.1003 ¶59. Vendetti’s system, which charges users different rates based on location, naturally fits with the use of a profile record that includes allowed locations and flags. Thus, a POSITA would have combined Granberg with Vendetti as a straightforward implementation for managing service profiles for charging such different rates. Ex.1003 ¶59.

Additionally, a POSITA would have found it obvious to modify Vendetti’s system teachings to include service flags to activate and deactivate location-based services, in addition to Vendetti’s location-based rates, based on the teachings of Granberg. Ex.1003 ¶60. It was well known at the time of the ’720 patent that it was desirable to implement systems that provided both location-based rates and

location-based services. Ex.1003 ¶60; Ex.1010, 1:4-19 (“defin[es] call tariffs” and “defin[es] available services” “on the basis of the location of the mobile station,” such as lower tariffs and special services when a subscriber is at home); Ex.1005, 6:42-56 (provides a “service profile” defined for a “localized service area” such as “call pricing” (i.e., *tariffs*) and *services* such as call prioritization, routing of incoming email messages, and activation or inactivation of automatic call transfer and/or voice mail service). Moreover, modifying Vendetti’s system teachings that provide location-based rates to also include location-based services beneficially expands the application and usefulness of Vendetti’s zone marking system.

Ex.1003 ¶60.

A POSITA would have had a reasonable expectation of success in combining Vendetti’s system teachings with Granberg’s service flag for location-based services teachings. Vendetti already contemplated changing what rate was offered depending upon location; Granberg’s teachings simply extend the location-based offerings to additional services. And as already noted, other prior art systems had already implemented systems which provided both location-based tariffs and location-based services. Ex.1010, 1:4-19; Ex.1005, 6:42-56; Ex.1003 ¶61.

Accordingly, a POSITA would have found it obvious to modify Vendetti’s system, which teaches location-based tariff rates, to implement a tariff setting functionality to activate and deactivate the different tariffs, and additionally

incorporate location-based services, as taught by Granberg. Ex.1003 ¶¶50-62.

4. Claim 1

[1.0] A method associated with the use of a mobile station and a radio communication defining device that transmits a distinctive defining signal, the method comprising:

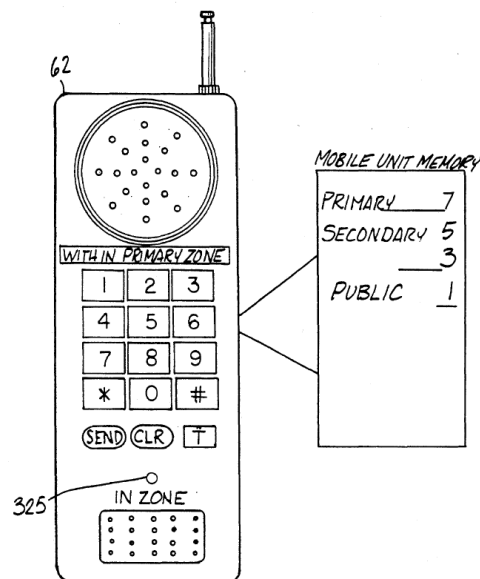
To the extent [1.0] is limiting, in the combination, Vendetti discloses it.

Ex.1003 ¶¶63-69.

Vendetti discloses “[a] handset of a mobile unit.” Ex.1009, 12:44-45.

Vendetti’s “mobile unit” is a *mobile station*, since the *mobile station* and

Vendetti’s “mobile unit” operate within, and are serviced by, a mobile telephone network. See Ex.1001, 6:3-4; Ex.1009, 1:20-23, Figure 10; Ex.1003 ¶64:



Ex.1009, FIG. 10.

Vendetti also discloses a marker transmitter (*a radio communication defining device*). Vendetti’s system “comprises **a plurality of marker**

transmitters located throughout the cellular service area.” Ex.1009, 2:59-61; *see also* Abstract (marker transmitters disposed throughout a cellular area “to transmit a zone identification signal...independent of normal RF cellular coverage”). Figure 3 illustrates “a pair of marker channel transmitters M_1 and M_2 (marker transmitters) [that] transmit marker signals on a common, dedicated 30 kHz cellular traffic channel or portion thereof,” which “mobile unit 62” monitors “to determine if it is in one of these zones.” Ex.1009, 5:14-32, Figure 3; Ex.1003 ¶65:

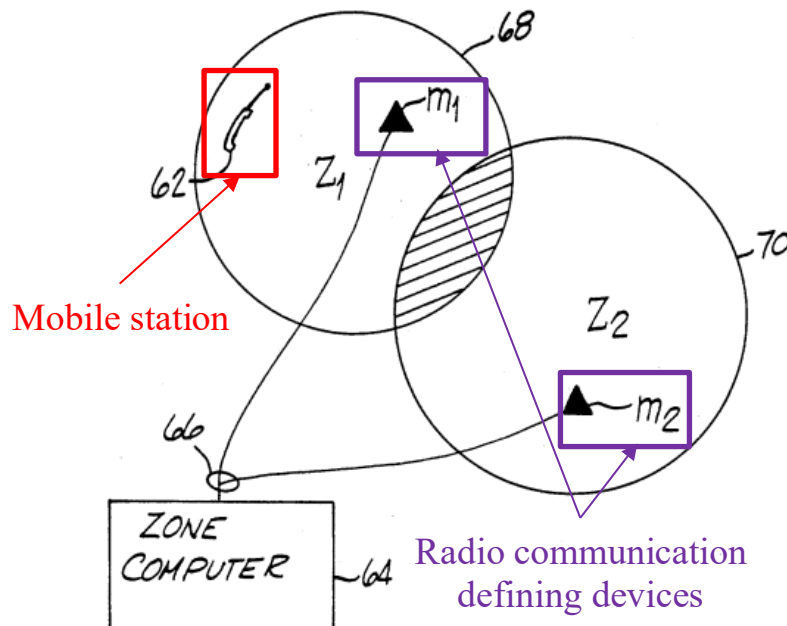


FIG. 3

Ex.1009, FIG. 3 (annotated); Ex.1003 ¶65.

Vendetti’s marker transmitter transmits a “marker signal” (*that transmits a distinctive defining signal*) to the mobile unit. “[T]he **marker signal** can be

received by a mobile unit in a radio frequency coverage area that is substantially coincident with the boundaries of the zone.” Ex.1009, 2:61-65. The marker signals include “**zone identification signals** that are unique to each zone in the cellular service area” and “**a variable password** that is unique to the particular zone.” Ex.1009, 2:65-67, 3:27-29; Ex.1003 ¶66.

Figure 5 illustrates “marker signal 80” “divided into N time slots $S_1, S_2, S_3, \dots S_N$.” Ex.1009, 7:25-26. For an exemplary “time slot S_4 ,” a “**zone identification signal 84**” and a “**password 86**” are transmitted, where “[o]nly the marker transmitters that mark a given zone transmit the zone identification signal 84 during a single time slot.” Ex.1009, 7:34-37, 43-45; *see also* 3:27-29, 7:45-50, 10:17-27, Figure 5; Ex.1003 ¶67:

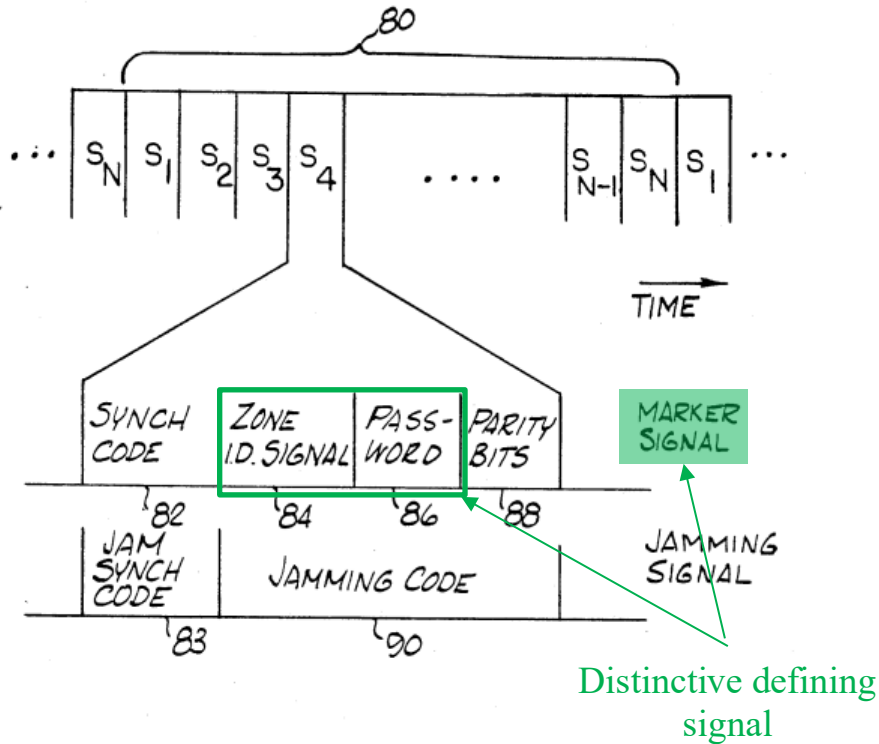


FIG.5

Ex.1009, FIG. 5 (annotated); Ex.1003 ¶67.

Finally, Vendetti discloses *methods* for transmitting a marker signal from the marker transmitter, and for the mobile unit receiving and using the marker signal. This includes Figure 7's "**flow chart of a computer program for operating each marker transmitter to mark one or more zones** within a cellular service area" and Figure 8's "**flowchart of a computer program that causes a mobile unit...to determine whether it is within a zone.**" Ex.1009, 9:48-50, 10:58-60; *see also* claim 1 (method); Ex.1003 ¶68.

Thus Vendetti's marker transmitter sending a marker signal including zone information and a password to the mobile unit teaches [1.0]. Ex.1003 ¶¶63-69.

[1.1] *receiving and processing the distinctive defining signal in the mobile station;*

In the combination, Vendetti describes the mobile unit *receiving* a marker signal including the zone identification signal and password (collectively, *a distinctive defining signal, see [1.0]*). These marker signals, transmitted “by one or more marker transmitters,” are “**received by a mobile unit.**” Ex.1009, 2:61-67. “Each mobile unit monitors a marker channel to **receive the marker signals transmitted by the marker transmitters**” and “receives the zone identification signals for” a particular preselected zone. Ex.1009, 3:1-6; Ex.1003 ¶71.

As further explained with respect to Figure 8, Vendetti’s mobile unit “acquires the marker channel” at block 184. Ex.1009, 11:3-4. From there, “**the mobile unit monitors the marker channel** to determine **whether the mobile unit has received a zone identification signal** that matches a zone identification signal stored within the mobile unit’s internal memory.” Ex.1009, 11:5-9, Figure 8; Ex.1003 ¶72:

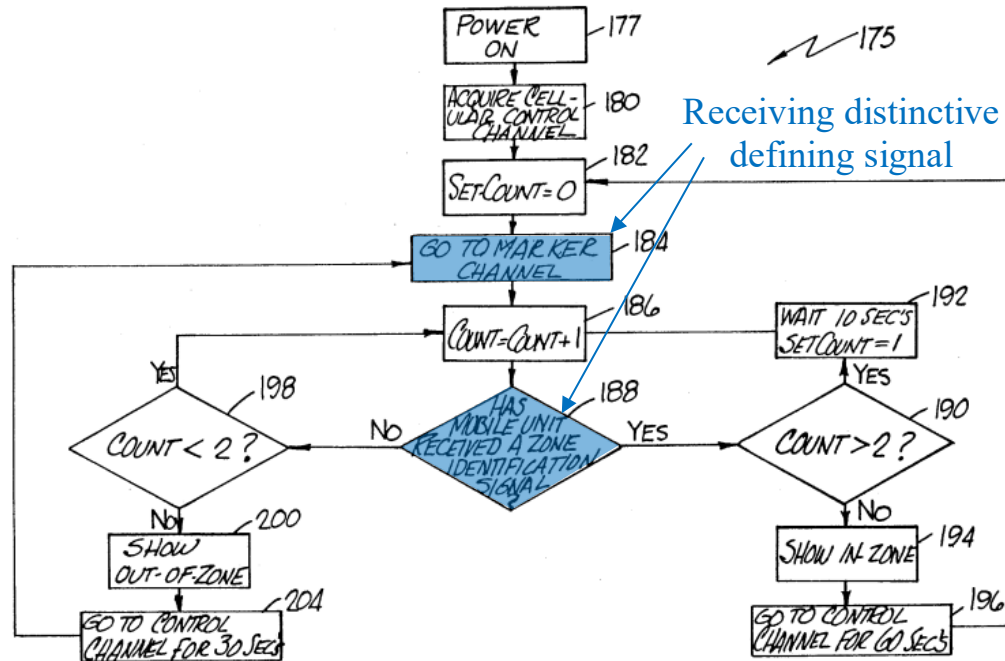


FIG. 8

Ex.1009, FIG. 8 (annotated); Ex.1003 ¶72.

As noted at [1.0], the marker signal received by the mobile unit includes both the “zone identification signal and a password for the particular zone” (*distinctive defining signal*). Ex.1009, 7:34-50, Figure 5; Ex.1003 ¶73.

Vendetti further discloses the mobile unit *processing* the marker signal that includes the zone identification signal and password (*distinctive defining signal*). Vendetti’s mobile unit extracts information from the marker signals including the zone identification signal and a password for storage and subsequent operations. See Ex.1009, Figure 5, 7:63-66 (mobile unit “stores the received password” and will “update its memory” if the password changes), 11:54-12:2 (mobile unit receives signal and detects it is in a zone, which includes operations based on the

received zone identification signal and zone password). For example, “[t]he zone identification signals stored within the mobile unit’s memory **are compared [by the mobile unit] to the zone identification signals received** from the marker transmitters.” Ex.1009, 12:60-62; *see also* 3:29-33, 11:5-9; Ex.1003 ¶74.

These actions are consistent with the use of *processing* in the ’720 patent, where *processing* at least refers to comparing received signal codes to codes stored in the mobile station itself. Ex.1001, 6:62-7:3. Vendetti discloses the very same concept of comparing received identifiers with stored identifiers, as noted above. Ex.1009, 12:60-62; *see also* 3:29-33, 11:5-9; Ex.1003 ¶75.

Thus, in the combination, Vendetti’s mobile unit receiving and processing the marker signal including zone information and a password discloses [1.1]. Ex.1003 ¶¶70-76.

[1.2] *the distinctive defining signal at least defining a special area by one or more of: (1) a coverage area of the distinctive defining signal; (2) a portion of the coverage area that intersects with another area of coverage of another radio communication defining device; and (3) a sum of the area of coverage and the another area of coverage;*

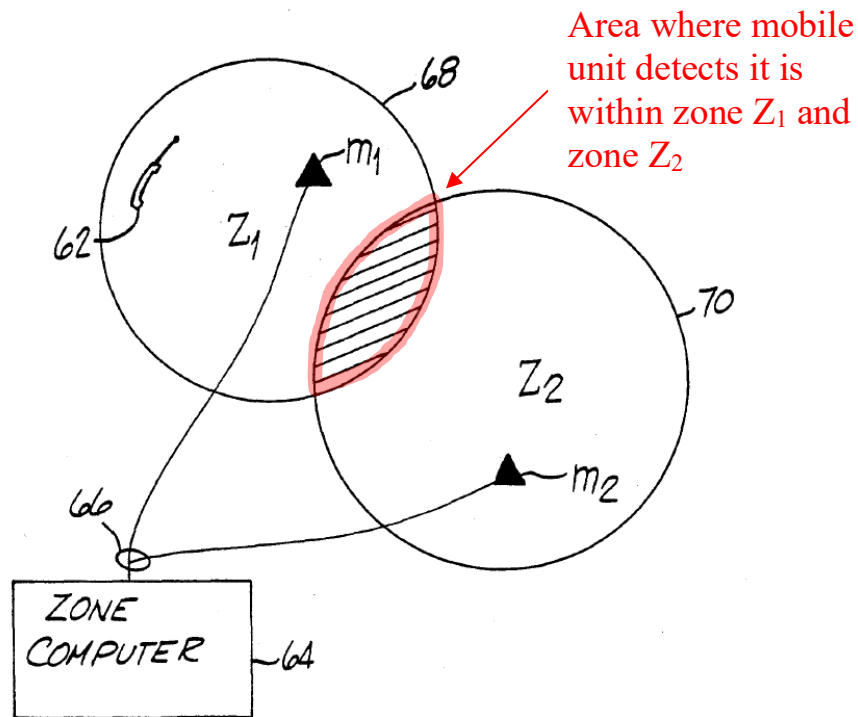
Patent Owner has interpreted this limitation as being disjunctive, i.e., one of the three options is sufficient to meet the full limitation, in their preliminary infringement contentions. Ex.1051, 11-12 (asserting limitation is met by a “distinctive defining signal” that “at least defines a first special area by its BLE beacon range (e.g., coverage area of the distinctive defining signal).”). Thus, if the

Board agrees any one of these options are demonstrated below, Vendetti discloses [1.2] in its entirety. Moreover, to the extent the claim is interpreted to be conjunctive, i.e., all three options are required, Vendetti also renders obvious all the options. Ex.1003 ¶¶77-88.

First, Vendetti discloses the zone identification signal (part of a marker signal) having a radio frequency coverage area that corresponds to the boundaries of a particular zone (*the distinctive defining signal at least defining a special area by...(1) a coverage area of the distinctive defining signal*). In Vendetti, “[a] marker signal is transmitted by one or more marker transmitters” and “received by a mobile unit **in a radio frequency coverage area that is substantially coincident with the boundaries of the zone.**” Ex.1009, 2:61-67. Vendetti further explains that the zone identification signal (part of the marker signal) “is transmitted in a radio frequency coverage area that **illuminates the zone to be identified[.]**” Ex.1009, Abstract. As demonstrated in [1.0], the marker signal including the zone identification signal is *the distinctive defining signal*. The marker transmitter’s radio frequency coverage area *defin[es] a special area by...(1) a coverage area of the distinctive defining signal*. This, alone, discloses [1.2]. Ex.1003 ¶78.

Second, Vendetti further discloses an intersecting area where the mobile unit receives two or more zone identification signals (in the marker signals) from different marker transmitters (*the distinctive defining signal at least defining a*

special area by...(2) a portion of the coverage area that intersects with another area of coverage of another radio communication defining device). Vendetti discloses an embodiment with two zones, “zone Z_1 ...defined by the boundary line 68 and zone Z_2 ...defined by boundary line 70.” Ex.1009, 5:61-65. There is also the “shaded area” where zones Z_1 and Z_2 intersect and the mobile unit “detects that it is **within both zone Z_1 and zone Z_2 .**” Ex.1009, 5:37-40, Figure 3; Ex.1003 ¶79:



Ex.1009, FIG. 3 (annotated); Ex.1003 ¶79.

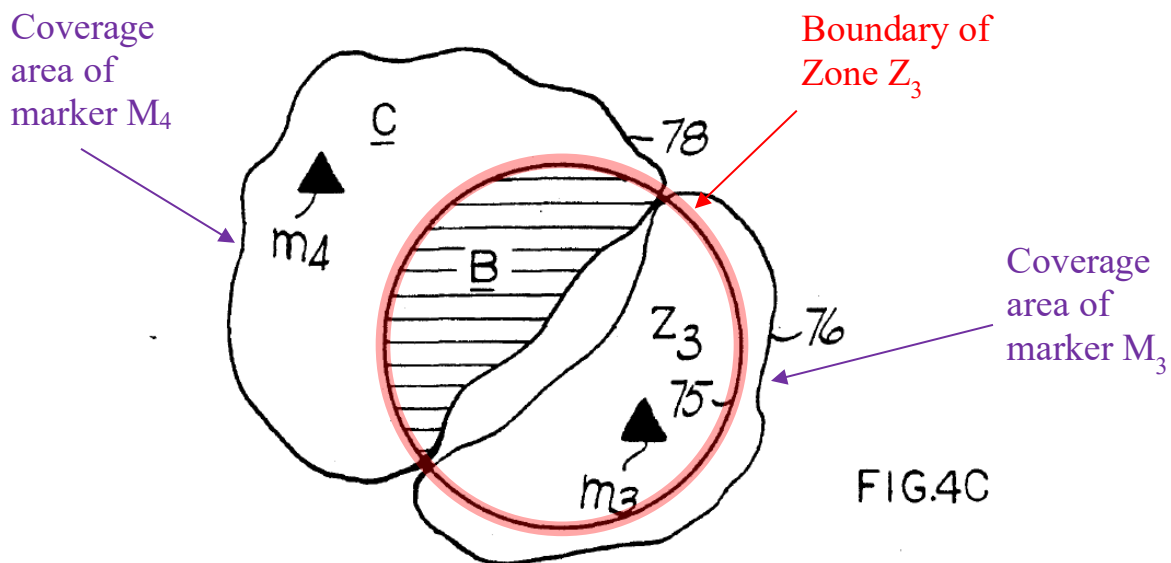
The mobile unit detects it is within both zone Z_1 and zone Z_2 because the mobile unit receives the marker signals from M_1 and M_2 . See Ex.1009, 5:14-25, 5:37-40. The mobile unit then “**decides which zone it is in according to a set of**

predetermined rules,” such as “to choose a primary zone over a secondary zone” or some other “priority conditions.” Ex.1009, 5:37-45; Ex.1003 ¶80.

This disclosure in Vendetti is consistent with how the '720 patent describes an intersection of a special area, where the special area is defined by the mobile station simultaneously receiving two or more defining signals: “[i]n the case where the special area is defined by two or more defining signals, **this special area may be the intersection of all or part of them** or the global coverage of the defining signals.” Ex.1001, 3:6-9. The “mobile station knows” it is in an “intersection of the coverage of several distinctive defining signals **when it is observing and recognizing at one time all these distinctive defining signals.**” Ex.1001, 16:4-8. Vendetti, similarly, discloses an area defined by the intersection of zones Z_1 and Z_2 and the mobile device recognizing it is in the shaded area when it observes and recognizes the marker signals from zones Z_1 and Z_2 . Ex.1003 ¶81.

Third, Vendetti discloses using the combination of two marker transmitters with radio frequency coverage areas corresponding to a larger zone, so that when a mobile unit receives either marker signal, it determines it is in that zone (*the distinctive defining signal at least defining a special area by... (3) a sum of the area of coverage and the another area of coverage*). For example, Vendetti discloses a “zone Z_3 ,” shown as “boundary line 75,” that is designated by “a radio frequency coverage area defined by boundary line 76” and “a radio frequency coverage area

defined by boundary line 78.” Ex.1009, 6:41-57, Fig. 4C; Ex.1003 ¶82:



Ex.1009, FIG. 4C (annotated); Ex.1003 ¶82.

Vendetti explains that “a marker transmitter M₃ located in the zone has a radio frequency coverage area defined by boundary line 76” (an *area of coverage*). Ex.1009, 6:42-44. Vendetti ensures coverage to shaded region “B” as part of zone Z₃ with “another marker transmitter M₄ [that] transmits the marker signal for zone Z₃ during the same time slot when marker transmitter M₃ is transmitting the marker signal that marks zone Z₃,” while also minimizing coverage to region C using jamming techniques. Ex.1009, 6:38-64. The coverage area of marker transmitter M₄ (boundary line 78) is *another area of coverage*. Vendetti “us[es] two or more marker transmitters to mark a zone” to fill “any holes within a zone.” Ex.1009, 6:57-60. Thus, Vendetti discloses defining

a special area using a sum of the area of coverage (marker transmitter M_3 's coverage area) and the another area of coverage (marker transmitter M_4 's coverage area) for zone Z_3 . Ex.1003 ¶83.

Vendetti further demonstrates the *sum of the area of coverage* in Figure 11, where “marker transmitters M_{26} and M_{27} ” are “dynamically reconfigured” so users in zone Z_{25} may still detect the zone even if marker M_{25} fails. Ex.1009, 13:5-18. Marker transmitters M_{26} and M_{27} are configured to “**simultaneously transmit the zone identification signal for zone Z_{25} ,**” thereby ensuring service does not degrade. Ex.1009, 13:18-24, 13:31-35, Figure 11; Ex.1003 ¶84:

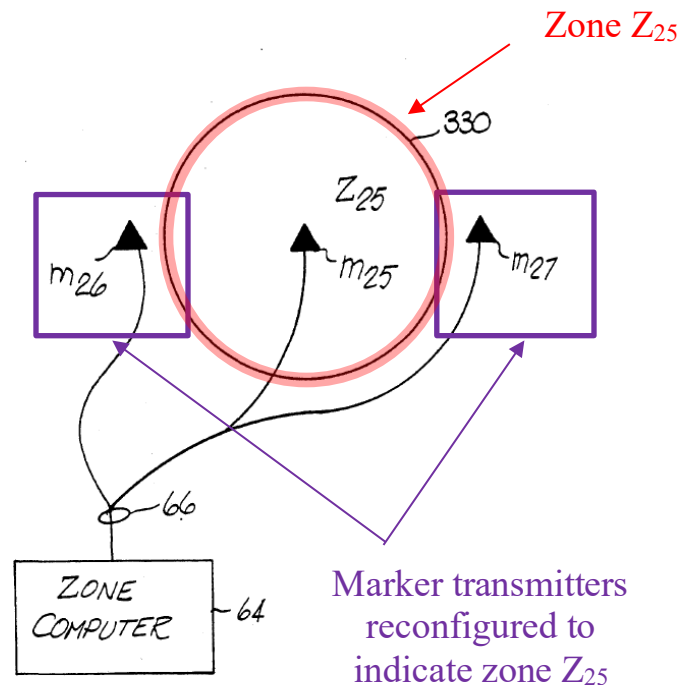


FIG. 11

Ex.1009, FIG. 11 (annotated); Ex.1003 ¶84.

Thus, the *special area* is defined by *a sum of the area of coverage* (marker transmitter M₂₆'s coverage area) *and the another area of coverage* (marker transmitter M₂₇'s coverage area) to correspond to zone Z₂₅. Indeed, Vendetti repeatedly discloses using multiple markers to collectively identify a particular zone. *See also* Ex.1009, 2:61-65, 6:65-7:3, 7:43-50, 8:46-53; Ex.1003 ¶¶85-86.

Vendetti's multiple disclosures of detecting one of multiple marker transmitter signals to indicate the entire boundary of a zone are consistent with how the '720 patent discusses the sum of coverage areas: "[i]f the special area is defined by the sum of the coverage of several distinctive defining signals, **the mobile station has to recognize at least one of the three distinctive defining signals at one time.**" Ex.1001, 15:66-16:3. Thus, Vendetti discloses *the distinctive defining signal at least defining a special area by... (3) a sum of the area of coverage and the another area of coverage.* Ex.1003 ¶87.

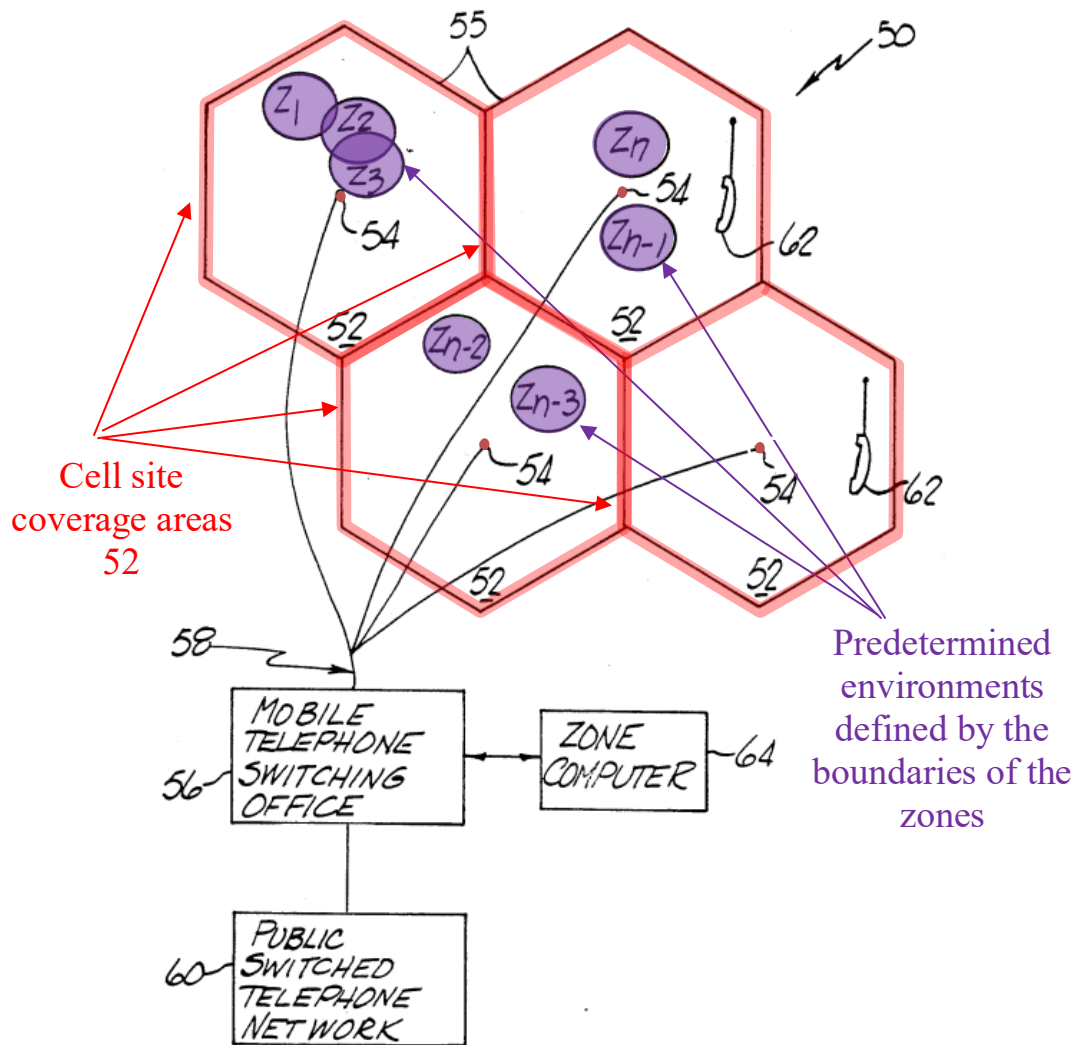
Accordingly, Vendetti, in the combination, renders obvious [1.2] regardless of whether this limitation is interpreted as being disjunctive (i.e., one of the three options are sufficient) or conjunctive (i.e., all three options are required). Ex.1003 ¶¶77-88.

[1.3] *the distinctive defining signal including information indicating whether or not the radio communication defining device is in a predetermined environment; and*

As discussed in [1.0]-[1.1], in the combination, Vendetti's marker

transmitter (*radio communication defining device*) transmits a marker signal (*distinctive defining signal*) to the mobile unit. The marker signal includes a zone identification signal and a “password 86.” Ex.1009, 7:14-37. The password 86 is “**a variable password that is unique to the particular zone**” (*information indicating whether or not the radio communication defining device is in a predetermined environment*). Ex.1009, 7:51-53, 3:27-29; Ex.1003 ¶90.

The particular zone itself—as defined by the “**boundary line**”—is a *predetermined environment*. Ex.1009, 6:13-17. The zones each demonstrate a *predetermined environment* because the zones are predefined in the cellular network: “[t]he **boundaries of the zones...are drawn on a map of the cellular service area according to the marketing needs of the cellular service provider.**” Ex.1009, 5:61-65. “[T]he cellular service area 55 [is divided] into a number of zones $Z_1, Z_2, Z_3, \dots Z_n$ ” that “may be larger or smaller than a cell site coverage area 52.” Ex.1009, 4:30-38, Figure 2; Ex.1003 ¶91:



Ex.1009, FIG. 2 (annotated); Ex.1003 ¶91.

In Vendetti's system, the marker transmitter (*radio communication defining device*) "transmit[s] the zone identification signal and the password for the zone." Ex.1009, 7:43-50. When a mobile unit is in a zone, it "stores the received password," and subsequently "transmits the password" to "a billing computer interfaced to the MTSO." Ex.1009, 7:63-8:1. At the MTSO, "[t]he password transmitted by the marker transmitter is compared to the password received from

the mobile unit,” and “[i]f the passwords are not the same, then the cellular service provider knows that the mobile unit cannot really be in the zone and therefore should not be given the ‘in-zone’ rate.” Ex.1009, 8:1-7; *see also* 3:27-37. The variable password “help[s] prevent fraud on the cellular service provider” by preventing an “unscrupulous user” from signaling to the MTSO that the mobile unit is “in its primary zone” and “given an ‘in zone’ rate on every call made or received regardless of the mobile unit’s location.” Ex.1009, 7:51-58; Ex.1003 ¶92.

Because Vendetti’s password from the marker transmitter is unique to each zone (“drawn on a map” beforehand), including zones associated with the mobile unit’s primary zone, and is used by the MTSO to determine if a mobile unit is within a primary zone, the password is *information indicating whether or not the radio communication defining device (the marker transmitter) is in a predetermined environment* (a particular zone previously drawn on a map). Ex.1003 ¶¶89-94.

[1.4] sending from the mobile station via a mobile telephone network the updating signal¹ to one or more servers of a provider of presence related services about the mobile station's presence in the special area,

In the combination, Vendetti's mobile unit transmits signals to the MTSO "under the current **cellular communications protocol**" (*sending from the mobile station via a mobile telephone network*). Ex.1009, 5:52-54. Such signals include the "zone identification signal," "password for the particular zone," and optionally a "zone type code" that "indicates to the MTSO whether the unit is in its primary, secondary or a public zone" (collectively, the *updating signal...about the mobile station's presence in the special area*). Ex.1009, 5:46-51; *see also* 11:66-12:5, 12:19-23; Ex.1003 ¶96.

This signal from the mobile unit is "transmitted **to the MTSO**," which includes "**a billing computer** interfaced to the MTSO" (*one or more servers of a provider of presence related services*). Ex.1009, 5:46-54, 7:60-8:1. A billing computer is a "*server*" and, therefore, teaches this limitation. The server term was commonly known in the art to encompass entities like billing computers. Ex.1003 ¶97. For example, "server" has been defined as:

¹ The term "the updating signal" appears to lack antecedent basis. For the purposes of this proceeding only, the art is applied to "**an** updating signal." Petitioner reserves the right to argue this term lacks antecedent basis in other proceedings.

- “[a] type of computer providing specific types of services to ‘client’ computers or terminals connected to a network.” Ex.1052 (Tech Terms: What Every Telecommunications and Digital Media Professional Should Know), 3;
- “a computer and/or program which responds to requests made by clients.” Ex.1053 (Wiley Electrical and Electronics Engineering Dictionary), 4;
- “a computer running administrative software” that “provides resources to computers functioning as workstations on the network” or “a computer or program that responds to commands from a client.” Ex.1054 (Microsoft Computer Dictionary Fifth Edition), 3;
- “A program that provides services to other programs, called *clients*. Usually a server and its clients run on different computers attached to a network.” Ex.1055 (The Facts On File Dictionary of Computer Science), 3-4;
- “A system on a network that provides a service to other systems connected to the network.” Ex.1056 (A Dictionary of Computing), 3;
- “a computer that provides services to another computer (called the *client*).” Ex.1057 (Dictionary of Computer and Internet Terms), 3;
- “a program which provides some service to other (client) programs.” Ex.1058 (Newton’s Telecom Dictionary), 4.

In Vendetti, the billing computer interfaced to the MTSO is *one or more servers of a provider of presence related services* because it is a computer on a

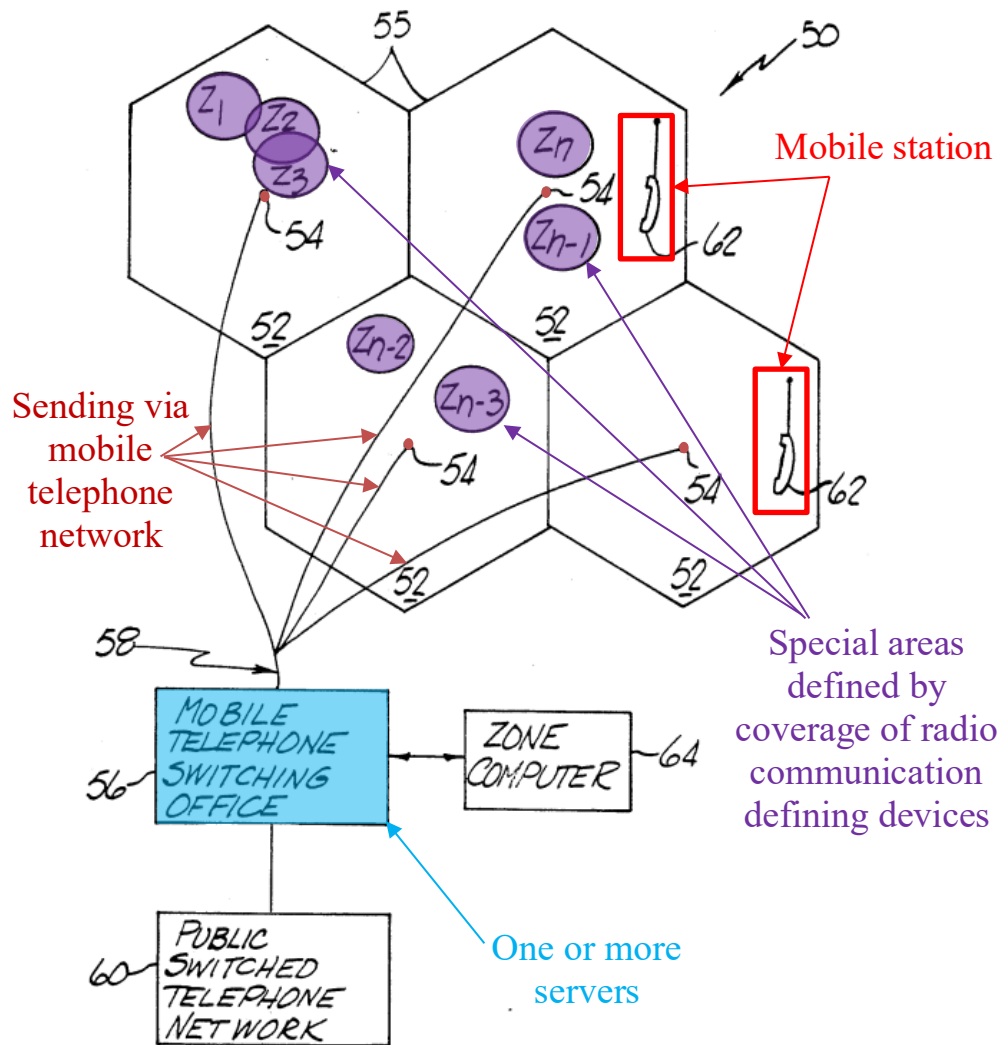
shared network of the MTSO that provides billing-related services to the MTSO, consistent with this understanding. Ex.1003 ¶98.

Additionally, in view of the above-demonstrated understanding of “server,” the MTSO, with or without the billing computer, would also be *one or more servers of a provider of presence related services*. Ex.1003 ¶99. Vendetti teaches that the MTSO determines “which zone the mobile unit is in and what password the mobile unit has received from the zone” so that “the **rate charged to the user can be varied based on the mobile unit[']s location** within the zone.” Ex.1009, 5:55-60. Vendetti’s MTSO thus performs *presence related services*. Ex.1003 ¶99.

Further, it was well known that MTSOs provided billing services, including Vendetti’s presence-related billing services. Ex.1003 ¶100; Ex.1058, 3 (“The MTSO...is a sophisticated computer” that “keeps track of billing information”); Ex.1053, 3 (MTSO “houses the computers that monitor and control a mobile cellular communications system,” performing functions such as “gathering billing information”); Ex.1059 (McGraw-Hill Illustrated Telecom Dictionary), 3 (MTSO “is where the billing...happens). It was also well known that MTSOs contained a computer or processors (*a server*) to perform these presence-related billing services. Ex.1003 ¶101; Ex.1045, 2:30-35 (MTSO contains “peripheral processors [and] adjunct processors”); *see also* Ex.1058, 3; Ex.1053, 3; Ex.1060, 3 (MTSOs including a computer). Because Vendetti’s MTSO charges users different rates

based on the mobile unit's location in a zone (Ex.1009, 5:55-60), it is also *one or more servers of a provider of presence related services*. Ex.1003 ¶¶100-101.

Vendetti illustrates a mobile unit transmitting signals via a mobile telephone network to the MTSO (and, therewith, the billing computer):



Ex.1009, FIG. 2 (annotated); Ex.1003 ¶102.

Thus, Vendetti's mobile unit sending a signal including the zone identification signal, password, and zone type code to the billing computer or the

MTSO using cellular communications renders obvious [1.4]. Ex.1003 ¶¶95-103.

[1.5] *the updating signal being useable by the one or more servers of the provider of presence related services to adjust an operating parameter, which comprises one or more of a tariff and a service flag, to adjust, activate, or deactivate the presence related services provided to the mobile station, and*

The Vendetti-Granberg combination renders obvious [1.5]. Ex.1003 ¶¶104-110. Vendetti teaches that, after the mobile unit sends the updating signal to the MTSO, the MTSO “is able to **determine which mobile unit is sending the signal, which zone the mobile unit is in and what password the mobile unit has received for the zone**” (*the updating signal being useable by the one or more servers of the provider of presence related services*). Ex.1009, 5:46-58. This includes the billing computer, as further demonstrated in [1.4]. *See, e.g.*, Ex.1009, 5:46-54, 7:63-8:1; Ex.1003 ¶105.

Vendetti further explains that “[w]ith this data, **the rate charged to the user can be varied based on the mobile unit[']s location** within the zone”; the rate charged is *a tariff*. Ex.1009, 5:46-60. In Vendetti, “the user is billed according to a rate schedule set for” a particular zone. Ex.1009, 4:43-46. For example, “[i]f, while in the **primary zone**, the user initiates or receives a telephone call, a signal is transmitted to the MTSO 56 and **the user is billed for the call at a rate set for that particular zone.**” Ex.1009, 4:53-56. “If the unit is within a **secondary zone** at the time of call initiation, a signal is transmitted to the MTSO and **the user is billed at a ‘secondary zone’ rate**”; if the mobile unit is in a “**public zone**,” it is

“billed for calls...at a ‘public zone’ rate.” Ex.1009, 4:67-5:7. Vendetti’s

updating signal is “forwarded to the [MTSO] **where the rate charged to the user for the call is adjusted based on his location** within the cellular service area.”

Ex.1009, 12:39-43. Thus, Vendetti’s MTSO with a billing computer (*one or more servers of the provider of presence related services*) is responsible for billing.

Ex.1003 ¶106; Ex.1058, 3; Ex.1053, 3; Ex.1059, 3; (all defining MTSO to include providing billing services). Vendetti thus renders obvious that the one or more servers update the rate charged (*one or more servers of the provider of presence related services to adjust an operating parameter, which comprises one or more of a tariff*). Ex.1003 ¶106.

Vendetti leaves up to a POSITA details on how to implement the rate changes based on the user’s location in a particular zone. A POSITA would have thus been motivated to turn to Granberg’s well-known flag-setting techniques to implement Vendetti’s rate-change teachings. Ex.1003 ¶107. Granberg confirms it was well known for a server, like Vendetti’s MTSO and billing computer, to use a database to maintain profiles for users’ rates for different areas—“a database that stores and manages subscriptions.” Ex.1037, 6:3-4. 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. “[E]ach 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, 7:44-48.

“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, “**the flag is reset or otherwise deactivated**.” Ex.1037, 7:53-54. Granberg’s network-specific indicator including one or more flags that can be set/activated or reset/deactivated teaches *adjust[ing] an operating parameter, which comprises one or more of...a...flag, to adjust, activate, or deactivate the presence related services provided to the mobile station.* Ex.1003 ¶107.

In the combination, Vendetti’s MTSO and billing computer would maintain service profiles that each include adjustable flags for the rates charged based on the location of a mobile station, as modified by Granberg’s teachings. The Vendetti-Granberg combination thus renders obvious *one or more servers of the provider of presence related services to adjust an operating parameter, which comprises one or more of a tariff...flag to adjust, activate, or deactivate the presence related services provided to the mobile station.* Ex.1003 ¶108.

The Vendetti-Granberg combination charging location-based rates via tariff flags, alone, thus renders obvious [1.5] under a disjunctive view of *one or more of*

a tariff and a service flag. Patent Owner has understood the limitation disjunctively in its preliminary infringement contentions, alleging this limitation is met by adjusting “at least one operating parameter” that is “location data.” Ex.1051, 33. Because the combination renders obvious a “*tariff flag*,” the Vendetti-Granberg combination renders obvious [1.5] in its entirety. Ex.1003 ¶¶105-108.

Even if it is argued that the claim is conjunctive, the Vendetti-Granberg combination further renders obvious “*a service flag*.” In Granberg, “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**” (*a service flag*). Ex.1037, 7:44-48. It would have been obvious to combine Granberg’s teachings of service flags with Vendetti’s cellular system teachings. This would be a simple application of a known technique to improve Vendetti’s similar system in the same way. *KSR*, 550 U.S. at 417; Ex.1037, 2:4-11, 7:42-54; Ex.1003 ¶109.

Indeed, it was well known and desirable to provide systems supporting both location-based rates and location-based services. Ex.1003 ¶109; Ex.1010, 1:4-19; Ex.1005, 6:42-56. Thus, it would have been obvious to modify Vendetti’s system teachings to include location-based network services and maintenance thereof by adjusting a service flag, as Granberg teaches. Ex.1003 ¶109.

Thus, the Vendetti-Granberg combination providing an MTSO and billing

computer that adjusts a tariff flag, alone or in addition to a service flag, to provide location-based tariffs or services renders obvious [1.5]. Ex.1003 ¶¶104-110.

[1.6] *the updating signal comprising the information indicative of whether or not the radio communication defining device is located in the predetermined environment.*

As explained in [1.4], Vendetti discloses that the signal sent from the mobile unit to the MTSO includes the “zone identification,” “**password for the particular zone,**” and optionally a “zone type code” (an *updating signal*). The signal “indicates to the MTSO whether the unit is in its primary, secondary or a public zone.” Ex.1009, 5:46-51; *see also* 11:66-12:5, 12:19-23. As explained in [1.3], the password for the particular zone (with zone boundaries defined beforehand by the cellular network) is *information indicative of whether or not the radio communication defining device is located in the predetermined environment* because it is unique to each zone and is used to determine if a mobile unit is within a particular zone, including a primary zone. Ex.1003 ¶¶111-113.

5. Claim 2

The method according to claim 1, wherein the sending of the updating signal is uncorrelated to any mobile station phone call establishment, the updating signal being sent at least one of (i) periodically, (ii) at times recent to when the mobile station enters into or exists² from the special area, and (iii) when the mobile station remains in the special area.

If this limitation is interpreted to be disjunctive, then in the combination Vendetti renders it obvious.

As discussed in [1.4], Vendetti discloses the mobile unit transmitting a signal including the “zone identification,” “password for the particular zone,” and optionally a “zone type code” (*sending an updating signal*). Ex.1009, 5:46-51; *see also* 11:66-12:5, 12:19-23. The mobile unit will “attempt to determine if it is in one of [the primary or secondary zones] by **periodically monitoring the marker signals transmitted on the marker channel.**” Ex.1009, 5:26-32. “If the mobile unit detects” that it is in a particular zone, “the user will be billed” at the corresponding zone rate. Ex.1009, 5:32-37. This occurs because “[t]he **signal transmitted by the mobile unit** that indicates the mobile unit is within a zone **comprises the zone identification signal and a password for the particular zone,**” including “a ‘**zone type code**’” “that indicates to the MTSO whether the unit is in its primary, secondary or a public zone” (*updating signal*). Ex.1009, 5:46-

² In this proceeding, Petitioner understands the term “*exists*” to mean “*exits*.”

51. This signal is “transmitted to the MTSO.” Ex.1009, 5:52-54; Ex.1003 ¶115.

Because the signal transmitted to the MTSO is in response to periodically monitoring the marker signals, the signal transmission also occurs periodically (*sending of the updating signal is uncorrelated to any mobile station phone call establishment, the updating signal being sent at least one of (i) periodically*).

Ex.1003 ¶¶114-116.

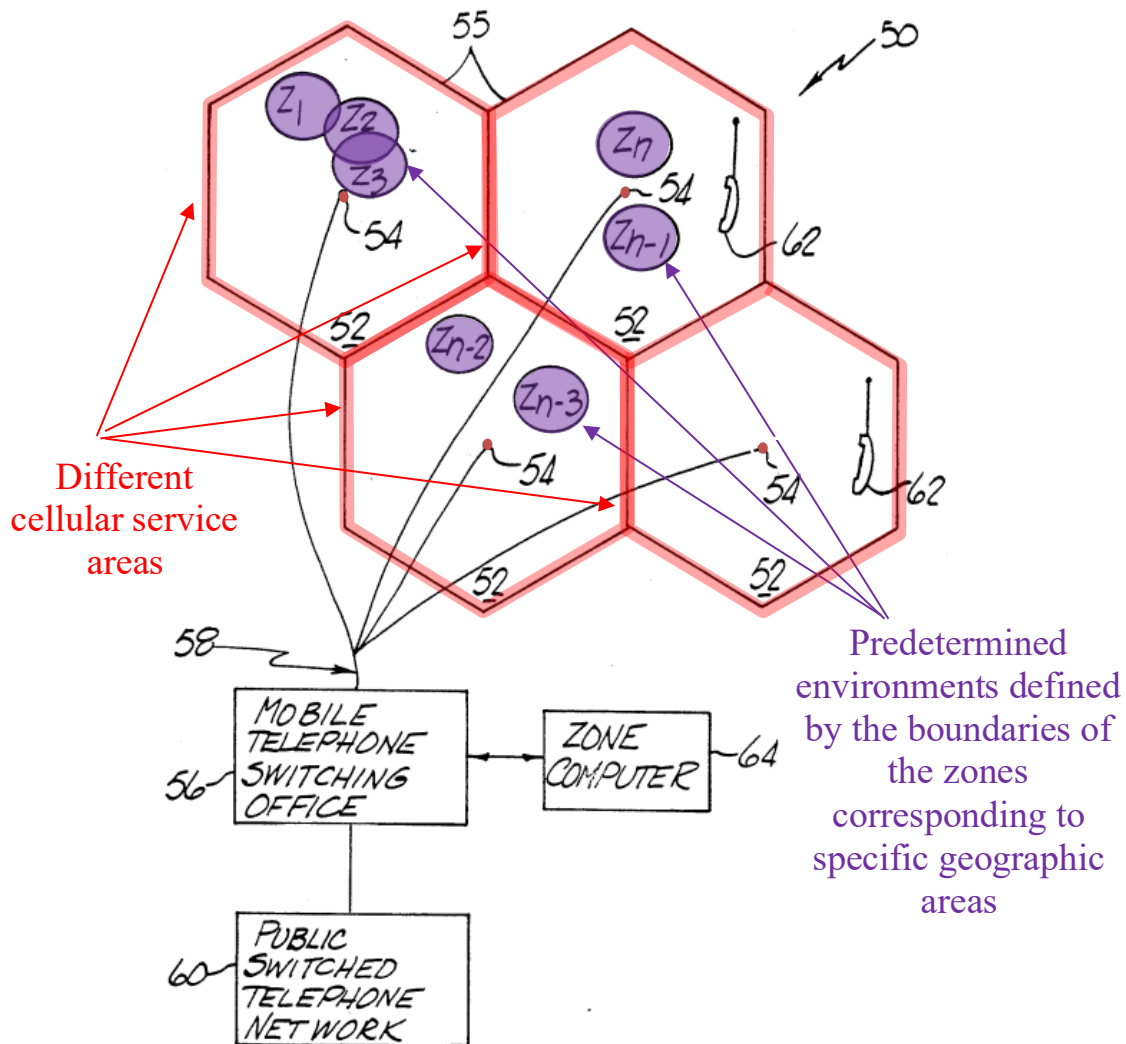
6. Claim 5

The method according to claim 1, wherein the predetermined environment comprises one or more of: (1) one or more specific geographic locations; (2) a physical environment; (3) an environment defined by an operator of the mobile telephone network; and (4) an area defined by a fixed network.

Patent Owner has interpreted this limitation as being disjunctive. Patent Owner’s preliminary infringement contentions allege that this limitation is met by a “radio communication defining device” that “is in a physical environment that can be mobile/moving.” Ex.1051, 80. Because Vendetti discloses all options as demonstrated below, Vendetti renders obvious claim 5 regardless of whether it is interpreted as being disjunctive or conjunctive. Ex.1003 ¶¶117-124.

First, in the combination, Vendetti discloses different zones with boundaries previously defined by the cellular network (*predetermined environment*) corresponding to geographic areas (*comprises... (1) one or more specific geographic locations*). Ex.1003 ¶118. Vendetti teaches that its inventive cellular telephone system 50 has a “**division of the cellular service area 55 into a**

number of zones $Z_1, Z_2, Z_3, \dots, Z_n$. These zones may be located in separate geographic areas or may overlap partially or completely. The zone may be larger or smaller than a cell site coverage area 52. However, each zone typically has a diameter of approximately five miles.” Ex.1009, 4:30-38. Figure 2 shows the zones corresponding to different geographic areas:

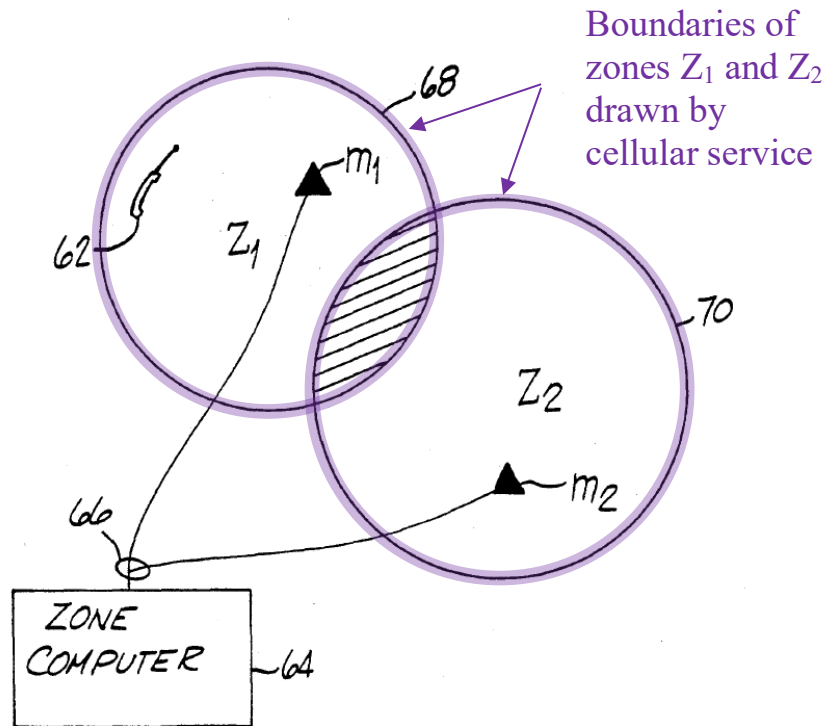


Ex.1009, FIG. 2 (annotated); Ex.1003 ¶118.

Second, Vendetti discloses zones with boundaries defined previously by the

cellular network (*the predetermined environment*) corresponding to specific physical environments, “such as airport or shopping malls” (*comprises... (2) a physical environment*), resulting in determining the mobile unit is in a public zone and billed accordingly. Ex.1009, 5:2-7; Ex.1003 ¶119.

Third, Vendetti discloses *wherein the predetermined environment comprises... (3) an environment defined by an operator of the mobile telephone network*. Ex.1003 ¶120. Vendetti explains that the “cellular service provider” is the one that draws “[t]he **boundaries of the zones Z₁ and Z₂**” (*the predetermined environment and an environment*) “**on a map of the cellular service area** according to the marketing needs of the cellular service provider. For example, zone Z₁ is defined by the boundary line 68 and zone Z₂ is defined by boundary line 70” (*defined by an operator of the mobile telephone network*). Ex.1009, 5:61-65; *see also* Figure 3:



Ex.1009, FIG. 3 (annotated); Ex.1003 ¶120.

Fourth, Vendetti discloses *wherein the predetermined environment comprises... (4) an area defined by a fixed network*. Vendetti discloses that “[e]ach zone within the cellular service area is marked by the marker signal transmitted by each of the marker transmitters.” Ex.1009, 5:65-67. The marker transmitters, in combination with jamming techniques, “mark a zone to shape to radio frequency coverage areas of the marker transmitters so they coincide with the boundary of a zone as determined by the cellular service provider” (*the predetermined environment comprises... (4) an area defined by a... network*). Ex.1003 ¶121.

In Vendetti, a “[z]one computer 64 is responsible for coordinating the power levels transmitted by the marker transmitters.” Ex.1009, 9:35-37. The power level

of marker transmitters and jamming signals are “transmitted at a variety of power levels in order to shape the size of zone.” Ex.1009, 9:25-35. The zone computer communicates to the marker transmitters via a “communications link 58” that is “**a telephone line, fiber optic cable** or microwave link that directly connects the zone computer with the marker transmitter.” Ex.1009, 8:68-9:4. When the marker transmitters are connected to the zone computer through such physical communications links, the connections, zone computer, and marker transmitters together constitute *a fixed network*. Vendetti’s marker transmitter marking the zones based on the control of the zone computer (when connected to the marker transmitter through a physical communications link) thus renders obvious *the predetermined environment comprises... (4) an area defined by a fixed network*. Ex.1003 ¶122.

Vendetti’s configuration is consistent with how the ’720 patent uses a fixed network with respect to predetermined environments. *See, e.g.*, Ex.1001, 8:32-41 (the “wireless device” (i.e., *radio communication defining device*) defines a zone when it is “physically connected to any fixed network connection points”); Ex.1003 ¶123. Vendetti likewise discloses the marker transmitter defining a zone when it is physically connected to the zone computer via a physical network connection, which is a fixed network connection point. Ex.1003 ¶123.

7. Claim 7

[7.0] *A method comprising:*

See [1.0]. §XI.C.4; Ex.1003 ¶125.

[7.1] *wirelessly receiving, in a radio communication defining device, first information from a radio transmitting device:*

Vendetti discloses a “zone computer” (*radio transmitting device*) that communicates with the marker transmitter (*radio communication defining device*) via “a communications link 58” that is “a telephone line, fiber optic cable or **microwave link** that directly connects the zone computer with the marker transmitter” (*wirelessly receiving*). Ex.1009, 8:68-9:4, Figure 6; Ex.1003 ¶127:

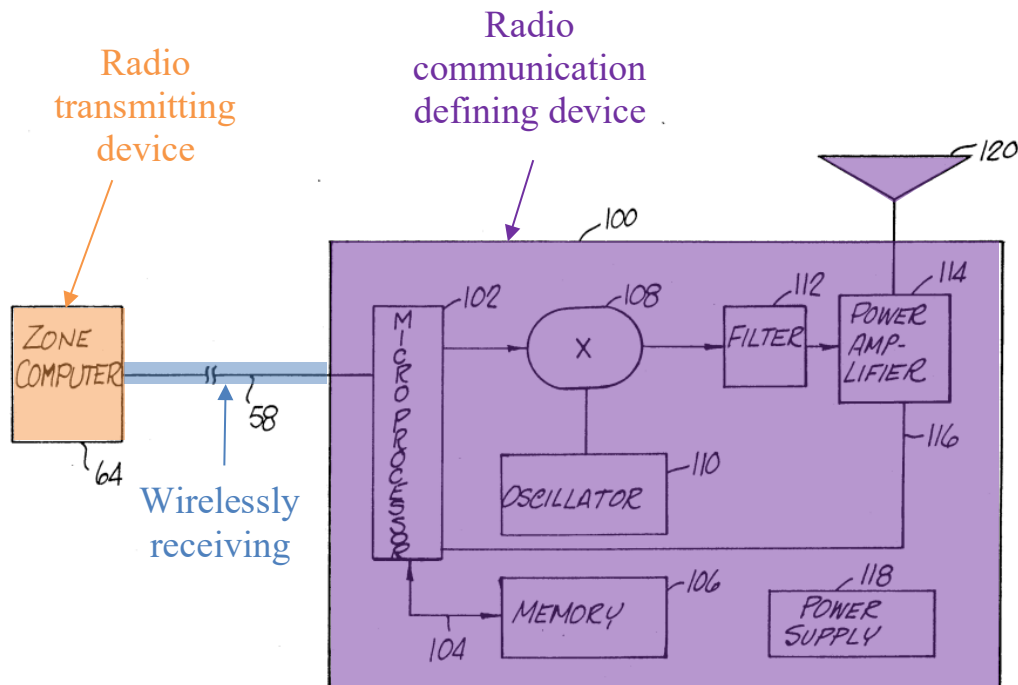


FIG. 6

Ex.1009, FIG. 6 (annotated); Ex.1003 ¶127.

Vendetti further teaches the zone computer (*radio transmitting device*) generating a “randomly selected **password for each zone** in the cellular area,” where the marker transmitter (*radio communication defining device*) receives “**zone identification signals**” and “**passwords**” (collectively, *first information*) “from the zone computer.” Ex.1009, 7:58-63, 9:50-54. The zone identification signals and passwords constitute *first information*, and therefore Vendetti discloses *receiving, in a radio communication defining device* (the marker transmitter), *first information from a radio transmitting device* (the zone computer). Ex.1003 ¶¶126-129.

[7.2] *the radio communication defining device using the first information to determine whether or not the radio communication defining device is in a predetermined environment:*

Vendetti provides “a flow chart of a computer program for operating each marker transmitter to mark one or more zones.” Ex.1009, 9:48-50. At block 154 below (shown in blue), the marker transmitters “obtain[] from the zone computer” “zone identification signals” and “passwords” (*first information*). Ex.1009, 9:50-54; Ex.1003 ¶131:

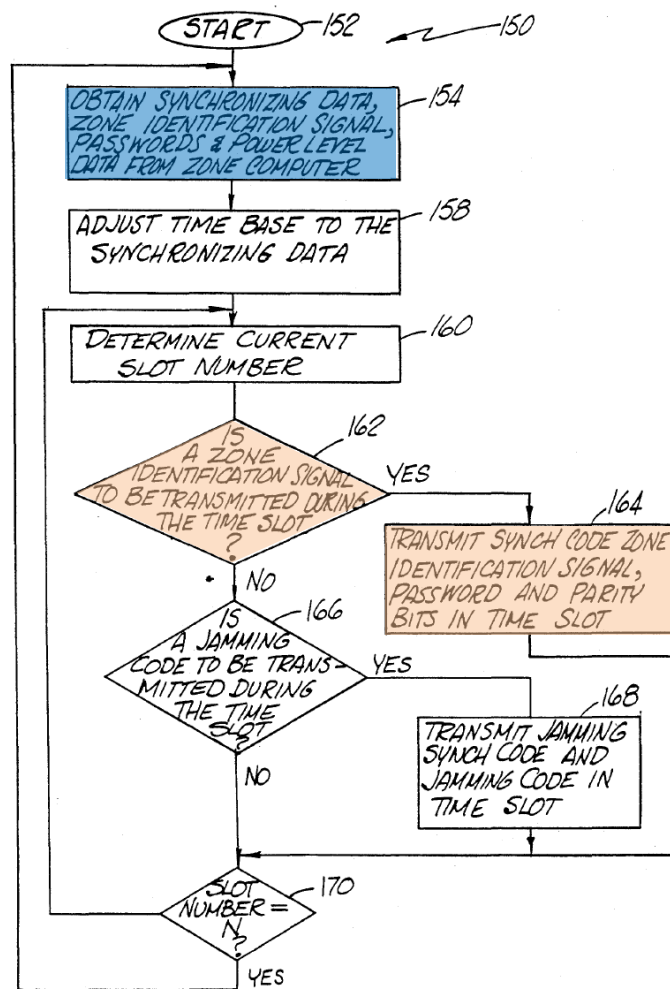


FIG. 7

Ex.1009, FIG. 7 (annotated); Ex.1003 ¶131.

This information “tells the marker transmitter what zone identification signals are to be transmitted in what time slot as well as what the current password is for each zone that the marker transmitter marks.” Ex.1009, 9:54-58. A POSITA would have understood that Vendetti’s disclosure of the marker transmitter “obtaining” this information from zone computer encompasses the marker transmitter processing and extracting the data informing the marker transmitter

what zones (with zone boundaries previously defined by the cellular network) it is to transmit for (the *predetermined environment*). Ex.1003 ¶132. Thus, Vendetti's obtaining of data associated with the marker transmitter receiving the zone identification signal and current password for the zone discloses *the radio communication defining device using the first information to determine whether or not the radio communication defining device is in a predetermined environment*. Ex.1003 ¶132.

Vendetti provides additional teachings that further render this limitation obvious at blocks 162 and 164 of Figure 7 above (shown in orange). At block 162, the marker transmitter “determines if it needs to transmit a zone identification signal during the current time slot.” Ex.1009, 10:17-21. If yes, then at block 164, the “zone identification signal” and “password” “are transmitted during the time slot.” Ex.1009, 10:17-24. Vendetti's disclosure of the marker transmitter determining it needs to transmit during a certain time slot, which Vendetti discloses as being associated with a particular zone (7:43-50), as well as associating the password with the particular zone, discloses *determin[ing] whether or not the radio communication defining device is in a predetermined environment*. Ex.1003 ¶¶130-134.

[7.3] *transmitting from the radio communication defining device to a mobile station a distinctive defining signal that at least defines a special area by one or more of: (1) a coverage area of the distinctive defining signal; (2) a portion of the coverage area that intersects with another coverage area of another radio communication defining device; and (3) a sum of the area of coverage and the another area of coverage; and*

See [1.0]-[1.2]. §XI.C.4; Ex.1003 ¶135.

[7.4] *wherein the distinctive defining signal includes second information indicating whether or not the radio communication defining device is located in a predetermined environment and*

As discussed in [1.0] and [1.3] above, in the combination, Vendetti teaches a marker transmitter (*radio communication defining device*) sending a marker signal with a zone identification signal and password for the zone (*distinctive defining signal including second information*) to the mobile unit. As discussed in [1.3] and [7.2] above, the zone identification signal and password indicate *whether or not the radio communication defining device* (the marker transmitter) *is located in a predetermined environment* (a particular zone with boundaries previously defined by the cellular network). Ex.1003 ¶136.

This *second information* in the marker signal (*distinctive defining signal*) is distinct from the *first information* because the *first information* is transmitted from the zone computer (*radio transmitting device*) to the marker transmitter (*radio communication defining device*) (see limitation [7.1]), while the *second information* is transmitted from the marker transmitter (*radio communication defining device*) to the mobile unit (*mobile station*) (see limitation [7.3]), as shown

in Figure 3. See §V; Ex.1003 ¶137; Ex.1009, Figure 3:

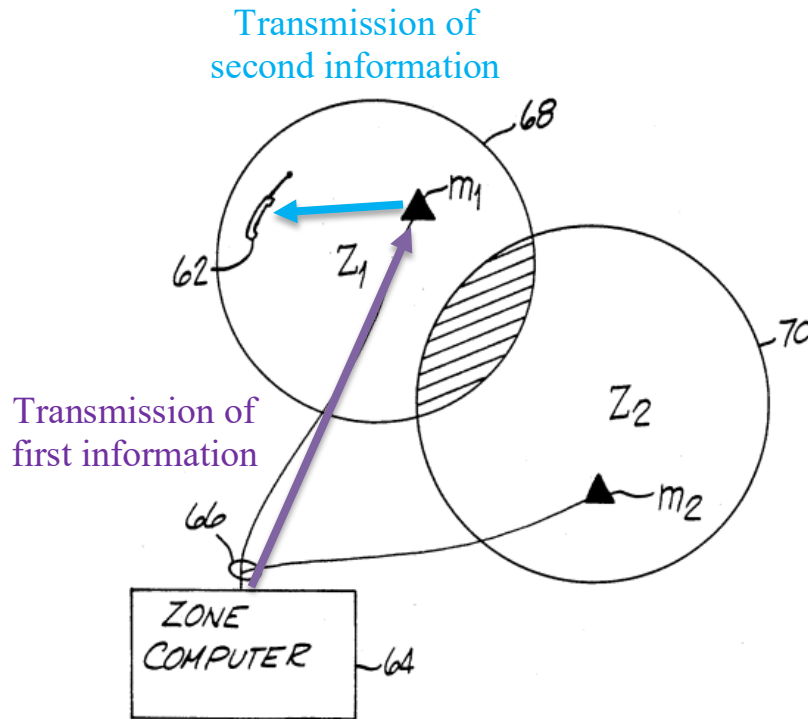


FIG. 3

Ex.1009, FIG. 3 (annotated); Ex.1003 ¶137.

Both the *first information* and *second information*, via the zone identification signal and password, indicate *whether or not the radio communication defining device* (the marker transmitter) *is in a predetermined environment* (a particular zone) as discussed in [1.3] and [7.2]. Ex.1003 ¶138.

This understanding of *first information* and *second information* is consistent with the '720 patent. The '720 patent describes the radio communication defining device having a “means for **obtaining reliable information indicating whether**

or not the said wireless device is located into a predetermined environment.”

Ex.1001, 5:34-40. This corresponds to *first information*. The ’720 patent also describes the radio communication defining device transmitting a “distinctive wireless signal” that contains “**reliable information confirming that the wireless device is effectively located into a predetermined environment.**” Ex.1001, 3:48-57; *see also* 7:56-61, 8:9-14. This corresponds to *second information*. Thus, in the ’720 patent, the *first information* and *second information* refer to the same information—“reliable information” indicating the radio communication defining device is in a predetermined environment—with the *first information* received by the radio communication defining device and the *second information* transmitted by the radio communication defining device. Ex.1003 ¶¶136-139.

[7.5] *the second information allowing the mobile station to generate an updating signal that enables presence related services for the mobile station to be adjusted based on one or more of tariffs and service flags generated based on the updating signal.*

See [1.4]-[1.5]. §XI.C.4; Ex.1003 ¶140.

8. Claim 9

The method according to claim 7, wherein the distinctive defining signal is coded.

In the combination, Vendetti discloses that “the marker signal is **Manchester encoded and frequency shift key (FSK) modulated** to aid the mobile units in synchronizing themselves to the marker signal. The details of

Manchester encoding and frequency shift key modulation are well known in the art and therefore are not discussed here.” Ex.1009, 9:13-19. Vendetti’s marker signal being Manchester encoded and FSK modulated thus discloses that *the distinctive defining signal is coded*. Ex.1003 ¶¶141-142.

9. Claim 10

The method according to claim 7, wherein the predetermined environment comprises one or more of: (1) one or more specific geographic locations; (2) a physical environment; (3) an environment defined by an operator of a mobile telephone network associated with the mobile station; and (4) an area defined by a fixed network.

See claim 5 above. §XI.C.6; Ex.1003 ¶143.

10. Claim 12

Claim 12 is identical to claim 7, except for how the *first information* is received. [7.1] requires *wirelessly receiving...first information*, whereas [12.1] requires receipt *via communication with a fixed network to which the radio communication defining device is physically connected*. Ex.1003 ¶144.

In the combination, Vendetti teaches the receiving *via communication with a fixed network to which the radio communication defining device is physically connected*. As discussed in [7.1], the marker transmitter (*radio communication defining device*) receives “**zone identification signals**” and “**passwords**” (collectively, *first information*) “from the zone computer.” Ex.1009, 9:50-54; *see also* 7:58-63. The zone computer communicates with the marker transmitter via “a

communications link 58” that is “**a telephone line, fiber optic cable** or microwave link that directly connects the zone computer with the marker transmitter”
(receiving...via communication with a fixed network to which the radio communication defining device is physically connected). Ex.1009, 8:68-9:4.
Ex.1003 ¶145.

Vendetti discloses the remaining limitations of claim 12 for the same reasons discussed in [7.0] and [7.2]-[7.5] above. §XI.C.7; Ex.1003 ¶146.

11. Claim 15

The method according to claim 12, wherein the predetermined environment comprises one or more of: (1) one or more specific geographic locations; (2) a physical environment; (3) an environment defined by an operator of a mobile telephone network associated with the mobile station; and (4) an area defined by the fixed network.

Claim 15 is identical to claim 5, except option 3 of claim 15 additionally discloses the bolded language: *an environment defined by an operator of a mobile telephone network **associated with the mobile station***. Vendetti discloses claim 15 for the same reasons discussed in claim 5 above. Ex.1003 ¶147. Additionally, Vendetti discloses that “[t]he boundaries of the zones Z_1 and Z_2 are drawn on a map of the cellular service area **according to the marketing needs of the cellular service provider**.” Ex.1009, 5:61-63. Vendetti’s cellular service provider “contract[s]” with the “user of a mobile unit” for different rates for different zones. Ex.1009, 4:39-46. The cellular service provider is therefore *an operator of a*

mobile telephone network associated with the mobile station. Ex.1003 ¶147.

D. Ground 2: Claim 2 is obvious over Vendetti, Granberg, and Kraufvelin.

1. Kraufvelin

Kraufvelin describes a system for “signalling...information that is generated based on the geographical location of the mobile station in response to a predetermined event such as entering or leaving a geographical area.” Ex.1006 ¶1. Kraufvelin’s system does so to “send information and/or offer services to a mobile station only in a particular defined geographic area.” Ex.1006 ¶12.

A mobile station “monitor[s] for an event indicative of a change in the presence status of the mobile station relative to said area of interest” and “signal[s] a notification in response to detection of such event.” Ex.1006 ¶¶15-18. The event includes “ENTERing the area” or “LEAVEing the area.” Ex.1006 ¶80. The system further includes “permanent area event reporting” where “the mobile does not send a repeated area arrival report or leaving area report for a cell belonging to the same service area more than once in a predetermined time interval” or an “area arrival report (AAR)” where “[t]he mobile only sends an area arrival report (AAR) after it has been camping on, or using, the relevant cell for a predetermined time period.” Ex.1006 ¶101; Ex.1003 ¶¶148-149.

2. Reasons to combine Kraufvelin with Vendetti and Granberg

A POSITA would have been motivated to combine the teachings of Kraufvelin with the Vendetti-Granberg combination for several reasons. Combining Kraufvelin's different timing for location updates with the Vendetti-Granberg combination's teachings related to sending an updating signal to a network node based on a mobile station's location would have been obvious, beneficial, and predictable. Vendetti describes sending an updating signal periodically. *See* §XI.C.5 above (claim 2). Kraufvelin also teaches sending an updating signal periodically, in addition to sending an updating signal upon entry or exit of a special area and when the mobile station remains in a special area, motivating a POSITA to utilize all three for more accurate location detection. Ex.1003 ¶150.

Kraufvelin is analogous art to the '720 patent. The '720 patent provides location-based services by "monitoring the presence of a mobile station in at least one special area." Ex.1001, Abstract. Kraufvelin is within the same field of endeavor, relating to "send[ng] information and/or offer[ing] services to a mobile station only in a particular defined geographic area" based on "monitoring...a change in the presence status of a target mobile station relative to an area of interest." Ex.1006 ¶¶12, 23. Further, Kraufvelin is reasonably pertinent to a particular problem with which the inventor of the '720 patent was involved (i.e.,

monitoring the location of a mobile station within a geographical area and providing location-based services) because it offers solutions for monitoring mobile devices within special areas. Ex.1006 ¶¶1, 12; Ex.1003 ¶¶151-153.

A POSITA would have been motivated to modify the Vendetti-Granberg teachings to also include sending location updates upon entry or exit of a special area and when the mobile station remains in a special area, as further taught by Kraufvelin. First, Kraufvelin teaches a system that includes sending updating signals periodically, when the mobile station enters or exits from the special area, and when the mobile station remains in the special area. Ex.1006 ¶¶80, 101. Thus, Kraufvelin teaches that multiple options are desirable. Second, modifying the mobile station to additionally send an updating signal regarding its location upon entry or exit of a special area and when it remains in a special area ensures accurate location of the mobile station for providing location-based tariffs and services. This is particularly useful since mobile stations are, by their very nature, mobile. By enabling the system to track the mobile station at all times (as would occur in the combined teachings), the system can provide the most accurate tariffs and services based on location. Ex.1003 ¶¶154-156.

A POSITA would have had a reasonable expectation of success in modifying the Vendetti-Granberg teachings to further provide an updating signal upon entry or exit of a special area and when the mobile station remains in a

special area. Kraufvelin expressly teaches that it was known in the art to provide a system where a mobile station can provide location updates periodically, when the mobile station enters into or exits from the special area, and when the mobile station remains in the special area. Ex.1006 ¶¶80, 101. Moreover, Vendetti already teaches transmitting an updating signal from the mobile station to the mobile service provider. Kraufvelin merely adds additional events for when the updating signal is sent. This modification is well within the knowledge and skill of a POSITA at the time of invention, as Kraufvelin demonstrates. Ex.1003 ¶157.

3. Claim 2

To the extent claim 2 may be interpreted to be conjunctive, the Vendetti-Granberg-Kraufvelin combination renders it obvious.

As discussed in claim 2 in §XI.C.5 above, the Vendetti-Granberg combination renders obvious *wherein the sending of the updating signal is uncorrelated to any mobile station phone call establishment, the updating signal being sent...(i) periodically*. And as discussed in [1.2], Vendetti teaches *a special area*. §XI.C.4; Ex.1003 ¶159.

In the present combination, Kraufvelin additionally renders obvious *wherein the sending of the updating signal is uncorrelated to any mobile station phone call establishment, the updating signal being sent at least one of (i) periodically, (ii) at times recent to when the mobile station enters into or exists from the special area,*

and (iii) when the mobile station remains in the special area.

First, Kraufvelin teaches that a mobile station may determine it has entered a cell of the area of interest 5 and then send “**a DTAP LCS-AreaEventReport...to the MSC/SGSN**” (*the updating signal*). Ex.1006 ¶82. If the mobile station is stationary for an extended period of time, “[i]n case of permanent area event reporting,” the mobile station will send the LCS-AreaEventReport at “**a predetermined time interval, e.g. every 10-15 minutes, 24 hours**” (*the updating signal being sent... (i) periodically*). Ex.1006 ¶101; Ex.1003 ¶161.

Second, Kraufvelin also teaches the mobile station sending the report when it enters or exits the area of interest 5 (*a special area*), including “[a]n area event LCS report indicating a positive match...i.e. the subscriber is **ENTERing the area**” or “indicating a negative match...i.e. the subscriber is **LEAVEing the area**” (*the updating signal being sent... (ii) at times recent to when the mobile station enters into or exists from the special area*). Ex.1006 ¶80; Ex.1003 ¶162.

Third, Kraufvelin also teaches that “[t]he mobile only sends an area arrival report (AAR) **after it has been camping on, or using, the relevant cell for a predetermined time period, e.g. 2 minutes**” (*the updating signal being sent... (iii) when the mobile station remains in the special area*). Ex.1006 ¶101; Ex.1003 ¶163.

Fourth, in each of the examples discussed above, the report that is transmitted is either triggered by time (*(i) periodically*) or location (*(ii) when the*

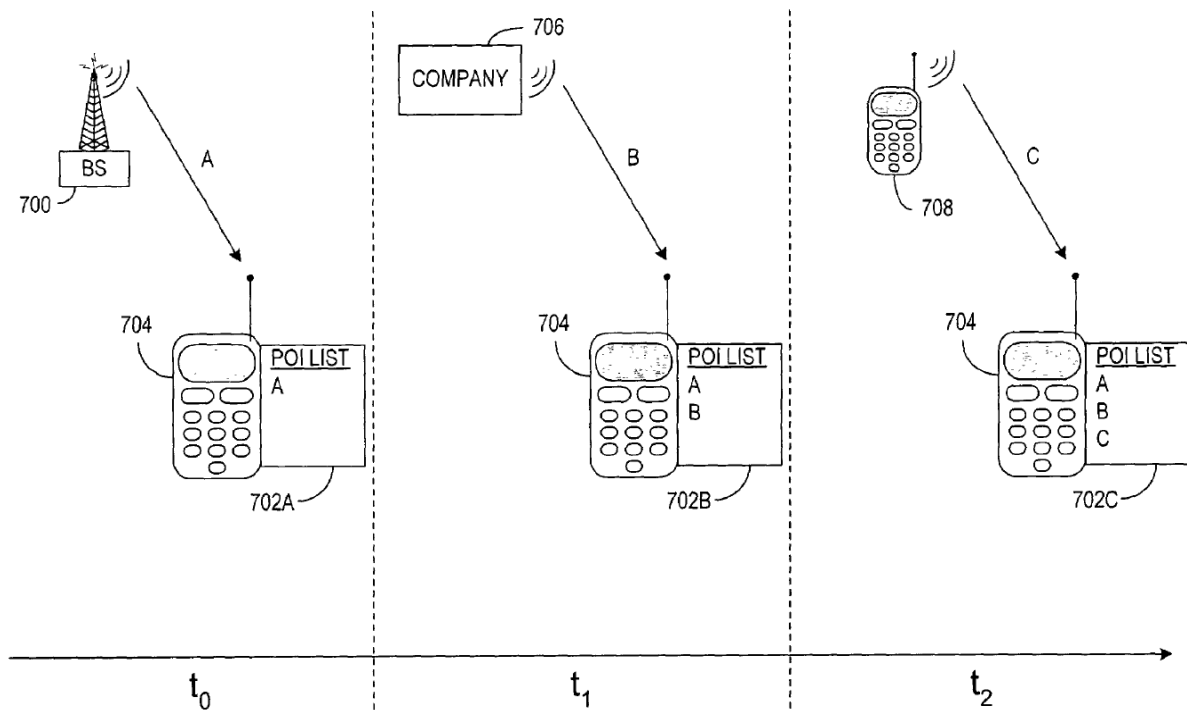
mobile station enters into or exists from the special area and (iii) when the mobile station remains in the special area). Because Kraufvelin’s report is transmitted by time or location, Kraufvelin teaches *the sending of the updating signal is uncorrelated to any mobile station phone call establishment.* Ex.1003 ¶¶164.

Thus, the Vendetti-Granberg-Kraufvelin combination renders obvious claim 2 even if it is interpreted to be conjunctive. Ex.1003 ¶¶158-165.

E. Ground 3: Claims 4, 6, 11, and 16 are obvious over Vendetti, Granberg, and Huomo.

1. Huomo

Huomo describes a system and method “for facilitating location-based triggering of actions, applications, services, and the like on wireless devices.” Ex.1016, Abstract. Locations are defined using “base station identifiers in a cellular network” or “identifier[s]” “provided by an access point” using a “short-range wireless service, such as Bluetooth, Wireless Local Area Network (WLAN), etc.” Ex.1016 ¶10. As shown in Figure 7’s system example, “[a]t a first time,” “the mobile terminal user is within a cellular network cell, and receives an identifier ‘A’ from a base station 700.” Ex.1016 ¶53. When the user later travels to a new location, “a company 706, such as a retail store, provides a radio frequency identifier ‘B’ to the mobile terminal 704.” Ex.1016 ¶53.



Ex.1016, FIG. 7.

A mobile terminal receives the identifiers associated with “Points of Interest (POI),” with various “actions, applications, services, etc.” linked to each POI.

Ex.1016 ¶36. For example, “a user’s re-entry into an area/cell 110, 112, 114 where a POI has been stored can automatically invoke an application(s) or other action(s) in accordance with the invention.” Ex.1016 ¶36; Ex.1003 ¶¶166-167.

2. Reasons to combine *Huomo* with *Vendetti* and *Granberg*

A POSITA would have been motivated to combine the teachings of *Huomo* with the *Vendetti-Granberg* combination to more granularly define locations for providing specific tariffs and services. Ex.1003 ¶¶168-173.

Huomo is analogous art to the ’720 patent. Like the ’720 patent, *Huomo* is in

the same field of endeavor because it relates to systems and methods for monitoring the location of a wireless device for providing location-based services. Ex.1016, Abstract. Additionally, Huomo is reasonably pertinent to a particular problem with which the inventor of the '720 patent was involved (i.e., monitoring the location of a wireless device and providing location-based services) because it offers solutions for “provid[ing] location-based service and application triggering for users” “without imposing heavy burdens on the network infrastructure.”

Ex.1016, Abstract, ¶5. Accordingly, Huomo is analogous art. Ex.1003 ¶¶169-170.

A POSITA would have been motivated to modify the Vendetti-Granberg combination teachings to include zone identification using both cellular network and short-range wireless technologies, similar to the system taught by Huomo. Huomo teaches “[i]n the cellular network context, the accuracy of the identified location substantially corresponds to the size of the cell,” and it is thus “desirable to further regulate which actions will be automatically invoked while in a particular cell, by further distinguishing subsections of a cell using a smaller scale wireless service such as Bluetooth, a WLAN, etc.” Ex.1016 ¶41. Huomo teaches it being desirable specifically to trigger services based on “a retail store” in a mall or “obtain information specific to” “a particular airline.” Ex.1016 ¶¶57-58. Thus, a POSITA would have been motivated to apply Huomo’s teachings for the desirable benefit of using short-range wireless technologies to mark smaller and more

precise zones, for example, within a mall or airport. Ex.1003 ¶171.

A POSITA would have had a reasonable expectation of success in modifying the Vendetti-Granberg combination teachings to use both cellular network and short-range wireless technologies. Huomo expressly teaches that, at the time of invention, it was known to define geographical locations for location-based services using both a cellular network and short-range wireless technologies. Ex.1016 ¶¶10, 41. Moreover, both systems describe use in similar, and thus compatible, settings. Vendetti’s system may indicate “public zones” such as “airports or shopping malls.” Ex.1009, 5:2-4. Huomo also teaches that points of interest may include “a retail store or mall” or “transportation services” such as “airports.” Ex.1016 ¶¶57-58; Ex.1003 ¶172.

Accordingly, a POSITA would have found it obvious to modify the Vendetti-Granberg system to use both cellular network and short-range wireless technologies, like the system taught by Huomo. Ex.1003 ¶¶168-173.

3. Claim 4

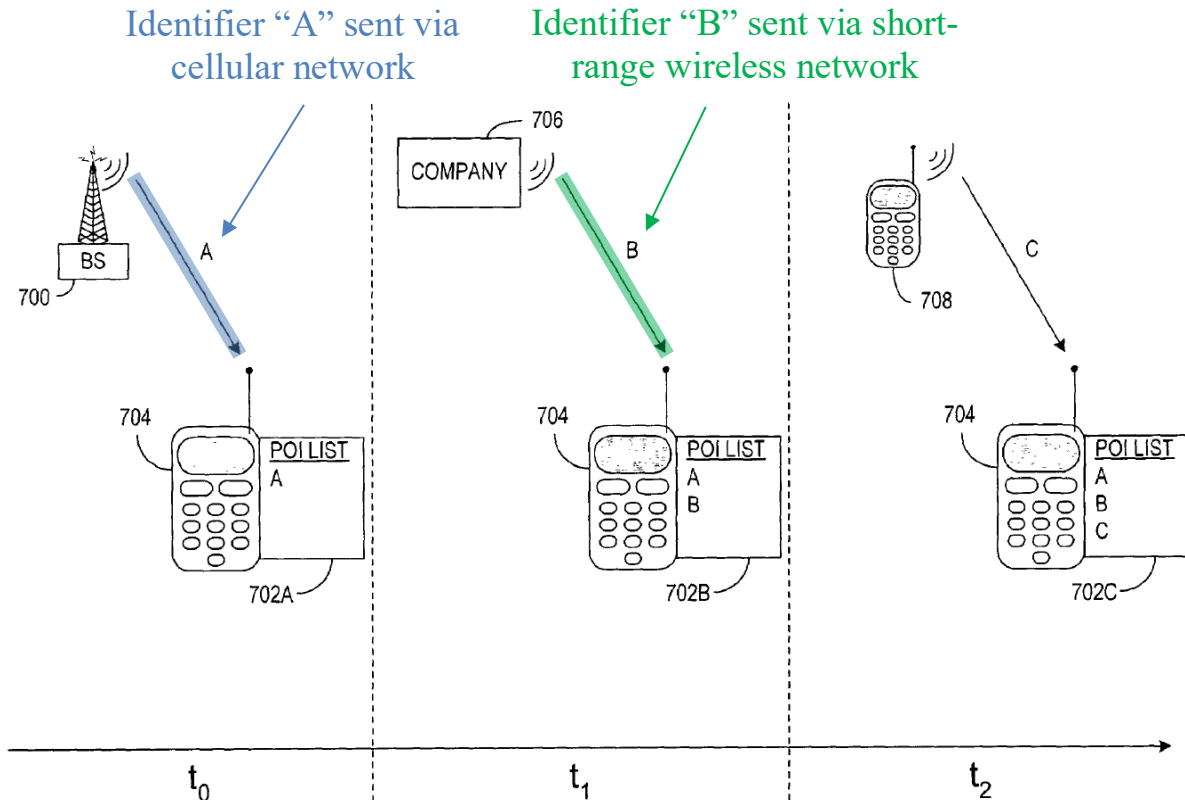
The method according to claim 1, wherein the frequency of the updating signal is different from the frequency of the distinctive defining signal.

As discussed in [1.0] and [1.4], Vendetti discloses a *distinctive defining signal* through its marker signal transmitted from the marker transmitter to the mobile unit, and an *updating signal* through its signal sent from the mobile unit to the MTSO. As also discussed in [1.4], Vendetti’s *updating signal* is sent through

cellular communications. Vendetti leaves frequency implementation details up to the POSITA, of which Huomo provides a well-known example. Ex.1003 ¶175.

Huomo discloses a system that provides location-based services using “cellular network” communications and “smaller-scale wireless services” including “short-range wireless services, such as Wireless Local Area Networks (WLAN), Bluetooth, or other radio technologies.” Ex.1016 ¶28, 40. “At a first time,” “the mobile terminal user is within a cellular network cell, and receives **an identifier ‘A’ from a base station 700**” (*distinctive defining signal*). Ex.1016 ¶53. Later, after the mobile terminal travels “to a new location,” “a company 706, such as a retail store, **provides a radio frequency identifier ‘B’ to the mobile terminal**” (*distinctive defining signal*). Ex.1016 ¶¶53, 41; Ex.1003 ¶176.

Huomo teaches that a wireless device (*mobile station*) may receive “base station identifiers in a cellular network” and an identifier “provided by an access point serving” a “short-range wireless service” area. Ex.1016 ¶10; Ex.1003 ¶177. Moreover, it was well known that cellular communications and short-range wireless communications operated at different frequencies. Ex.1003 ¶178; Ex.1046 ¶7. Figure 7 shows the different signals Huomo’s mobile terminal receives:



Ex.1016, FIG. 7 (annotated); Ex.1003 ¶177.

In combination, Vendetti-Huomo teaches a system of location-based services where a mobile station receives a “radio frequency identifier” (*distinctive defining signal*) using “short-range wireless services” like WLAN, Bluetooth, or other radio technologies, per Huomo, then sends an *updating signal* using cellular, per Vendetti. Ex.1003 ¶178.

Accordingly, Vendetti’s teachings of a cellular signal transmitted from the mobile unit to the MTSO combined with Huomo’s teachings of a short-range wireless signal transmitted from the access point to the mobile station renders

obvious claim 4. Ex.1003 ¶¶174-179.

4. Claim 6

The method according to claim 1, wherein the distinctive defining signal comprises a signal with a frequency that is outside a frequency range allocated for the mobile telephone network.

As discussed in claim 4, the Vendetti-Granberg-Huomo combination renders obvious a system of location-based services where a mobile station receives a “radio frequency identifier” (*distinctive defining signal*) using “short-range wireless services” like WLAN, Bluetooth, or other radio technologies, per Huomo, then sends an *updating signal* using cellular communications, per Vendetti. Ex.1003 ¶180.

Thus, the Vendetti-Granberg-Huomo combination renders obvious *wherein the distinctive defining signal comprises a signal with a frequency that is outside a frequency range allocated for the mobile telephone network* because the *distinctive defining signal* is transmitted using short-range wireless communications, which has a *frequency that is outside a frequency range allocated for the mobile telephone network* (the cellular communications). Ex.1003 ¶181. This is because it was well known that short-range wireless communications, like Bluetooth and WLAN, operated at a frequency outside the frequency range allocated for cellular networks. Ex.1003 ¶181; Ex.1046 ¶7.

5. Claim 11

The method according to claim 7, wherein the distinctive defining signal comprises a signal with a frequency that is outside a frequency range allocated for a mobile telephone network associated with the mobile station.

See claims 6 and 7. §§XI.C.7, XI.E.4; Ex.1003 ¶182.

6. Claim 16

The method according to claim 12, wherein the distinctive defining signal comprises a signal with a frequency that is outside a frequency range allocated for a mobile telephone network associated with the mobile station.

See claims 6, 12. §§XI.C.10, XI.E.4; Ex.1003 ¶183.

F. Ground 4: Claims 5, 10, 14, and 15 are obvious over Vendetti, Granberg, and Vimpari.

1. Vimpari

Vimpari discloses a system and method for “locating a mobile station” “in a predetermined area.” Ex.1010, 1:4-6. Vimpari describes “defining call tariffs” or “defining available services on the basis of the location of the mobile station.” Ex.1010, 1:6-8. Vimpari discloses a “guide unit 101” including “a radio transmitter” that emits a signal detectable at “premises 100 and to the immediate vicinity thereof.” Ex.1010, 4:23-29, Figure 1:

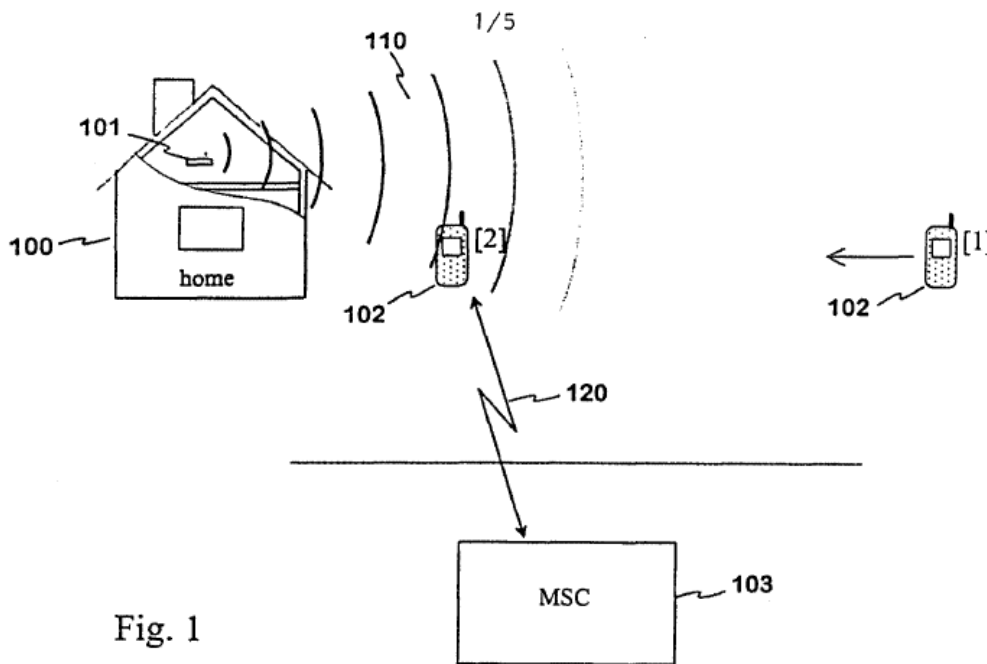


Fig. 1

Ex.1010, FIG. 1.

The guide unit is “provided with its own SIM module, which contains a secret identity number for verifying the validity of the unit.” Ex.1010, 7:24-25. The mobile station is in its “home area” when “the field 110 of the guide unit is observed.” Ex.1010, 4:27-5:2, 5:5-9. The mobile station then transmits “a message that it is located in the home area” to “mobile switching centre 103” so that “calls originated from the mobile station 102 are billed according to a tariff that is lower than before the mobile station entered the home.” Ex.1010, 5:9-13. When the mobile station is no longer in its home area, it sends a message to the mobile switching centre that “returns to normal rates for said mobile station.” Ex.1010, 6:21-29; Ex.1003 ¶¶184-185.

2. Reasons to combine Vimpari with Vendetti and Granberg

Vendetti is analogous art to the '720 patent. Vimpari is within the same field of endeavor because, like the '720 patent, Vimpari describes a system and method for monitoring the location of a mobile device and providing location-based tariffs and services. Ex.1010, 1:4-19, 10:9-14. Additionally, Vimpari is reasonably pertinent to a particular problem of the '720 patent (e.g., defining specific areas and providing location-based services) because it offers solutions for accurately detecting the location of a mobile station in a particular area using simpler and more economical devices. Ex.1010, 1:4-19, 2:13-32, 10:9-14. Accordingly, Vimpari is analogous art. Ex.1003 ¶¶187-188.

A POSITA would have been motivated to add information for verifying the validity of the marker transmitter, like the information taught in Vimpari, with the Vendetti-Granberg combination's marker transmitter teachings. Ex.1003 ¶189. Vendetti recognizes a need to "prevent fraud on the cellular service provider" and ensure that a mobile unit accurately indicates it is "in its primary zone" to be given the "'in zone' rate." Ex.1009, 7:51-58. Vimpari also acknowledges that a "necessary requirement" for providing location-based tariffs and services to a mobile subscriber is that the "location of a mobile phone at home or in some other predetermined place can be accurately detected." Ex.1010, 1:16-19. In addition to Vendetti's teachings of verifying the mobile unit, Ex.1009, 7:51-8:7, Vimpari

teaches the desirability of verifying the guide unit/marker transmitter when providing location-based tariffs and services, Ex.1010, 7:15-32. Thus, applying Vimpari's technique of providing information at the guide unit to verify the validity of the guide unit would be a simple application of Vimpari's known technique to improve Vendetti's similar system in the same way. *KSR*, 550 U.S. at 417; Ex.1003 ¶189.

A POSITA would have had a reasonable expectation of success in applying Vimpari's teaching of storing of information to verify the validity of the guide unit with the Vendetti-Granberg combination's marker transmitter teachings. Ex.1003 ¶190. Vendetti's marker transmitter includes a memory, which would provide suitable hardware structure for storing the information taught in Vimpari. Ex.1009, 9:6-9, Figure 6; Ex.1003 ¶190. Additionally, both Vendetti and Vimpari teach similar systems for providing located-based services, including a marker transmitter/guide unit to indicate the location of a particular area for location-based services, a mobile unit/mobile station that receives location-based services, and a MTSO/mobile switching centre for providing location-based services. Ex.1009, Abstract, 4:30-5:60; Ex.1010, 1:4-19, 4:23-5:2, 6:13-29. Given that Vendetti's marker transmitter has the appropriate structure and operates in a similar system as Vimpari's, a POSITA would have had a reasonable expectation of success in applying Vimpari's storing of information to verify the validity of the guide unit

with Vendetti's marker transmitter teachings. Ex.1003 ¶190.

Moreover, a POSITA would have been further motivated to apply Vimpari's teaching of charging a different tariff rate for calls placed while the mobile phone is physically connected to a telephone stand in the home to Vendetti's various ways of defining special rate zones. Ex.1003 ¶191; *see, e.g.*, Ex.1010, 2:7-12; Ex.1009, 4:67-5:7 (primary, secondary, and public zone rates). Both Vimpari and Vendetti are focused on ways to enable differentiated services including variable billing rates or other special features. Ex.1009, 2:42-46; Ex.1010, 1:15-19. Adding Vimpari's example of using a fixed location to determine to apply a particular rate would have provided additional robustness to Vendetti's system with a well-known implementation that assists with determining that the mobile device truly is at "home." Ex.1010, 1:9-25. This would have been nothing more than the combination of known elements (Vendetti's zone-based system teachings, Vimpari's fixed telephone stand), according to known methods (determining to apply a special tariff based on determined location), to yield predictable results (a special tariff rate applied when at home, as determined from connecting to the telephone stand). *KSR*, 550 U.S. at 417; Ex.1003 ¶191.

3. Claim 5

In addition to claim 5 of Ground 1 (§XI.C.6), the Vendetti-Granberg-Vimpari combination further renders claim 5 obvious under another example of a

fixed network (option (4)).

First, Vendetti discloses options (1)-(4) as demonstrated in Ground 1. *See* §XI.C.6; Ex.1003 ¶193.

Second, the Vendetti-Granberg-Vimpari combination further renders obvious option (4), because Vimpari further teaches defining a predetermined environment based on a fixed location of a telephone stand (*an area defined by a fixed network*). When a user brings a mobile phone to their home, “the mobile phone is set in a telephone stand provided with an individual SIM...containing subscriber data.” Ex.1010, 2:7-9. With the mobile phone plugged into the stand when making a call, “the mobile network knows that the mobile phone is at home and applies a lower call tariff.” Ex.1010, 2:9-12. Thus, Vimpari teaches *a predetermined environment* (the home) including a *fixed network* (home telephone network with a telephone stand as connection point). Ex.1003 ¶194.

In combination, it would have been obvious to implement Vimpari’s fixed telephone stand teachings with Vendetti’s zone teachings to achieve an additional type of zone in which to apply different tariff rates. Ex.1003 ¶195.

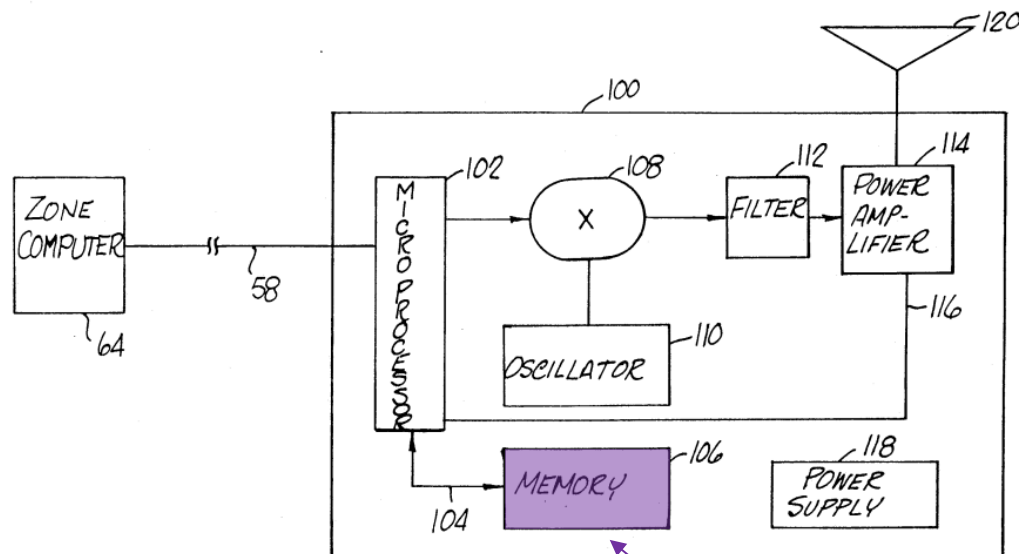
4. Claim 10

See claims 5 and 7 above. §§XI.C.6-7, XI.F.3; Ex.1003 ¶196.

5. Claim 14

The method according to claim 12, further comprising storing in a memory of the radio communication defining device one or more parameters useable to authenticate the radio communication defining device in the fixed network.

Vendetti-Vimpari renders claim 14 obvious. Ex.1003 ¶¶197-199. Vendetti's marker transmitter (*radio communication defining device*) has “**memory 106**” “**used to store temporary variables**” (*storing in a memory...one or more parameters*). Ex.1009, 9:6-9, Fig. 6:



Radio
communication
defining device
memory

Ex.1009, FIG. 6 (annotated); Ex.1003 ¶197.

As explained in claim 12, Vendetti's marker transmitter is physically connected to a fixed network. See §XI.C.10; Ex.1003 ¶197.

Vimpari additionally discloses a “guide unit” (*radio communication defining*

device) “installed permanently in the premises.” Ex.1010, 4:23-25. The guide unit transmits a signal detectable at “the premises” and “the immediate vicinity thereof” indicating a mobile station’s “home area.” Ex.1010, 4:25-5:2. The guide unit has “its own SIM module” (*memory*) containing “**a secret identity number for verifying the validity of the unit**” (*storing...one or more parameters useable to authenticate the radio communication defining device*). Ex.1010, 7:24-25. The secret identity number is used to calculate “a response number.” Ex.1010, 7:25-30. The response number is ultimately sent to the mobile switching centre, which authenticates the guide unit by “compar[ing] the received response number with the one that was earlier calculated in the centre” (*authenticate the radio communication defining device*). Ex.1010, 7:25-30. Ex.1003 ¶198.

In combination, Vendetti’s zone computer of the network—which is physically connected to the marker transmitter—would authenticate the marker transmitter because the marker transmitter interfaces with the network through the zone computer. Ex.1009, 3:23-26, 5:23-25, 8:63-9:47, 13:18-35; Ex.1003 ¶198.

Thus, the Vendetti-Granberg combination’s marker transmitter with a memory that is connected to a fixed network that would authenticate the marker transmitter and Vimpari’s guide unit that stores information for verifying the validity of the guide unit (e.g., authenticates) renders obvious claim 14. Ex.1003 ¶¶197-199.

6. Claim 15

See claims 5, 12. §§XI.C.6, XI.C.10, XI.F.3; Ex.1003 ¶200.

XII. CONCLUSION

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

Respectfully submitted,

Dated: September 11, 2025
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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 '720 patent is or was involved in the following cases:

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

C. Lead and back-up counsel and service information

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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 13,938. 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
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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. 10,009,720;
Petitioner's Power of Attorney;
Petitioner's Exhibit List;
Exhibits 1001-1006, 1009-1010, 1016, 1018-1019, 1021, 1037, 1045-1046, and 1051-1060.

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