

**UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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APPLE INC.,  
Petitioner

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IPR2025-01256  
U.S. Patent No. 8,738,040

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**DECLARATION OF R. MICHAEL BUEHRER, PH.D.,  
UNDER 37 C.F.R. § 1.68 IN SUPPORT OF PETITION  
FOR *INTER PARTES* REVIEW**

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I, R. Michael Buehrer, Ph.D., do hereby declare as follows:

**I. INTRODUCTION**

1. I am making this declaration at the request of Apple Inc. in the matter of the *Inter Partes* Review of U.S. Patent No. 8,738,040 (“the ’040 patent”) to Pérez LaFuente.

2. I am being compensated for my work in this matter at my standard hourly rate. I am also being reimbursed for reasonable and customary expenses associated with my work and testimony in this proceeding. My compensation is not contingent on the outcome of this matter or the specifics of my testimony.

3. I have been asked to provide my opinions regarding whether the subject matter of claims 1-14 (“the Challenged Claims”) of the ’040 patent would have been obvious to a person having ordinary skill in the art (“POSITA”) at the time of the alleged invention, in light of the prior art. It is my opinion that the Challenged Claims would have been obvious to a POSITA.

4. In the preparation of this declaration, I have studied:

- the ’040 patent, Ex.1001;
- the prosecution history of the ’040 patent (“’040 File History”), Ex.1002;
- U.S. Patent Publication No. 2006/0135174 to Kraufvelin, et al. (“Kraufvelin”), Ex.1006;

- U.S. Patent No. 6,230,017 to Andersson, et al. (“Andersson”), Ex.1007;
- U.S. Patent Publication No. 2005/0070283 to Hashimoto, et al. (“Hashimoto”), Ex.1008;
- U.S. Patent Publication No. 2001/0037211 to McNutt, et al. (“McNutt”), Ex.1014;
- U.S. Patent Publication No. 2003/0134636 to Sundar, et al. (“Sundar”), Ex.1017;

5. In forming the opinions expressed below, I have considered: the documents listed above; the relevant legal standards, including the standard for obviousness; and my own knowledge and experience based upon my work in the field as described below, as well as portions of the following additional materials:

- U.S. Patent No. 8,615,256 to Putkiranta (“Putkiranta”), Ex.1005;
- 3GPP Specification TS 23.171, version 1.10.0 (Jun. 2003) (“TS23.171 standard v.3.10.0”), Ex.1018;
- 3GPP Specification TS 23.171, version 1.0.0 (Oct. 1999) (“TS23.171 standard v.1.0.0”), Ex.1019;
- 3GPP Specification TS 23.032, version 3.0.0 (May 1999) (“TS23.032 standard v.3.0.0”), Ex.1021;

- 3GPP Specification TS 23.271, version 6.4.0 (Jun. 2003) (“TS23.271 standard v. 6.4.0”), Ex.1022;
- U.S. Patent Publication No. 2007/0167159 to Ramesh, et al. (“Ramesh”), Ex.1025;
- U.S. Patent Publication No. 2004/0203839 to Ostberg, et al. (“Ostberg”), Ex.1026;
- U.S. Patent Publication No. 2004/0235471 to Madsen (“Madsen”), Ex.1027;
- U.S. Patent Publication No. 2005/0285787 to Delaveau, et al. (“Delaveau”), Ex.1028;
- U.S. Patent Publication No. 2006/0019669 to Moon, et al. (“Moon”), Ex.1035;
- U.S. Patent No. 6,694,134 to Lu, et al. (“Lu”), Ex.1036;
- U.S. Patent No. 6,978,143 to Vialen (“Vialen”), Ex.1069; and
- U.S. Patent Publication No. 2005/0255850 to Auterinen (“Auterinen”), Ex.1070.

6. Unless otherwise noted, all **emphasis** in any quoted material has been added. Claim terms are *italicized*.

## II. QUALIFICATIONS AND PROFESSIONAL EXPERIENCE

7. My complete qualifications and professional experience are described in my *Curriculum Vitae*, a copy of which can be found in Exhibit 1004. The following is a brief summary of my relevant qualifications and professional experience.

8. I am currently a Professor of Electrical and Computer Engineering at Virginia Tech and the former (2014-2022) Director of *Wireless @ Virginia Tech*.

9. My academic and professional background is in Electrical and Computer Engineering, and I have been working in those fields since the completion of my Ph.D. over 25 years ago. Below, I provide a short summary of my education and experience that I believe to be most pertinent to the opinions I have formed in this case.

10. I received a B.S. in Electrical Engineering from The University of Toledo in 1991, an M.S. in Electrical Engineering from The University of Toledo in 1993, and a Ph.D. in Electrical Engineering from Virginia Polytechnic Institute and State University in 1996. The focus of my graduate work was wireless communication systems. My Ph.D. thesis involved the application of multiuser detection (an advanced signal processing approach to interference mitigation) to CDMA-based cellular systems.

**11.** After completion of my Ph.D. in 1996, I joined Bell Laboratories, the research division of Lucent Technologies, where I worked for five years as a Member of Technical Staff and later as a Distinguished Member of Technical Staff. My work there focused on developing advanced technologies for cellular telecommunications, including for 3G cellular standards. For example, while at Bell Labs, I developed and implemented algorithms for intelligent antenna systems that increased the voice capacity (i.e., number of simultaneous phone calls) and data capacity of cellular systems. These algorithms were included in Lucent Technologies' 3G CDMA cellular base station. I also developed techniques known as transmit diversity techniques that increased reliability (i.e., reduced the probability of a dropped call) of cellular systems. These transmit diversity techniques were standardized in the 3GPP2 cellular standard known as cdma2000. During that time, I supported the standardization of my ideas by writing contributions to the working groups developing the standards and attending standards meetings. In particular, I participated in the 3GPP2 standardization process. During that time, I worked with colleagues to include my ideas on the use of transmit diversity in CDMA systems in the 3GPP2 standard.

**12.** I am currently a Professor in the Bradley Department of Electrical and Computer Engineering at Virginia Polytechnic Institute and State University (Virginia Tech), where I have taught and conducted research in the area of wireless

communications, geolocation and radar for over 20 years. Specifically, I have taught courses that cover wireless communications and signal processing (including the underlying concepts) at the undergraduate and graduate levels. For example, I teach a sophomore-level course which introduces the concepts of signals and systems, a junior-level course which introduces the basic concepts of communication systems, senior-level and graduate-level courses that cover advanced digital communication topics, and also graduate-level courses that teach the advanced technologies underlying the latest wireless systems, such as Fourth and Fifth Generation (4G/5G) cellular communication standards (e.g., LTE, LTE-Advanced, New Radio) and Wi-Fi. I also teach graduate courses on advanced topics such as Information Theory, Machine Learning Applied to Communication Systems, Spread Spectrum Communications and CDMA. Furthermore, I have taught short courses covering topics such as position location and position location using ultra-wideband signals.

**13.** Additionally, I have conducted research into Ultra-Wideband (UWB) signal propagation, UWB receiver design, and UWB signal processing across a number of funded research projects. I also developed a UWB-based ranging system as part of an automated cargo container transfer system for the United States Navy. Further, I have developed geolocation systems in a number of research projects including designing a prototype system for localizing first responders, developing localization techniques for 5G and 6G cellular networks, localization sub-systems

for in-home smart health systems, algorithms for enhancing cellular-based localization, algorithms for localization in the presence of interference and harsh propagation, and a second UWB-based positioning system.

**14.** From 2014 until 2022, I also served as the director of *Wireless @ Virginia Tech*, a comprehensive research group focusing on wireless communications, which consists of 14 faculty members and approximately 85 graduate students. My specific research focuses on advanced wireless communications and geolocation techniques. This research has examined both advanced theoretical concepts as well as the application of these concepts to the latest wireless standards. As an example of the latter, I (along with my students) have conducted research applying multiuser/multi-antenna signal processing to LTE. I have also applied advanced geolocation techniques to LTE systems.

**15.** My research work has been funded by national agencies including the National Science Foundation (NSF), the Defense Advanced Research Projects Agency (DARPA), the Office of Naval Research (ONR), the Army Research Lab, the Air Force Research Lab as well as many industrial sponsors.

**16.** During 2009, I was a visiting researcher at the Laboratory for Telecommunication Sciences (LTS), a Federal Research Lab that focuses on telecommunication challenges for national defense. While at LTS, my research focus

was in the area of cognitive radio with a particular emphasis on statistical learning techniques.

17. I have authored and co-authored over 350 publications in my area of expertise, which have been published in the leading journals in my field including *IEEE Transactions on Communications*, *IEEE Transactions on Wireless Communications*, *IEEE Transactions on Information Theory*, *Proceedings of the IEEE*, and *IEEE Transactions on Signal Processing*, and at all of the major conferences in my field. These publications include the areas of wireless position location (i.e., geolocation). This research has been cited over 13,000 times. A complete list of my publications over the last 30 years is included in my Curriculum Vitae. I am a Fellow of the IEEE (so named “for contributions to wideband signal processing in communications and geolocation”). Additionally, in 2023 I received the prestigious MILCOM Lifetime Award for Technical Achievement. This award recognizes individuals who have made important technical contributions to military communications over the course of their careers. I was a co-recipient of both the Vanu Bose Award for the best paper and the Fred Eilersick Award for the best paper, both at the 2023 Military Communications Conference for my work on LEO-based geolocation. I was also a co-recipient of the Vanu Bose Award for the best paper at the 2021 Military Communications Conference.

**18.** In 2010, I was awarded the Ellersick Best Paper Award in the Unclassified Technical Program, at the IEEE Military Communications Conference. I received the SDR Forum Best Paper Award in 2007 and the Outstanding Paper Award at the SDR Forum in 2008. I received the Dean's Award for Teaching Excellence in April 2014 and the Dean's Award for Outstanding New Assistant Professor, College of Engineering in 2003. While at Bell Laboratories, I was awarded the Bell Labs President's Silver Award for outstanding research contributions and the 1999 Best Paper Award in the Bell Labs Technical Journal.

**19.** I also hold 18 issued patents in the area of wireless communications, many of which relate to wirelessly locating a wireless device.

**20.** I formerly served as an area editor for *IEEE Transactions on Wireless Communications* supervising a team of 12 editors. I also recently served as a guest editor for a special issue of the *Proceedings of the IEEE* and as a guest lead editor for a special issue of the *IEEE Journal on Special Topics in Signal Processing* relating to non-cooperative position location networks. I was formerly an associate editor for *IEEE Wireless Communications Letters*, *IEEE Transactions on Vehicular Technologies*, *IEEE Transactions on Communications*, *IEEE Transactions on Signal Processing*, and *IEEE Transactions on Education*.

**21.** Additionally, I formerly served as the guest editor for the *IEEE Journal on Special Topics in Signal Processing*. I served as the Technical Program Chair for

the Signal Processing for Communications Symposium at the 2017 IEEE International Conference on Communications. Previously, I was the Organizer and Technical Co-Chair for both the 2015 and 2016 IEEE Global Communications Conference Workshop on Localization and Tracking: Indoors, Outdoors and Emerging Networks (LION). I have also served on the technical program committees of several other conferences and workshops in my field.

**22.** A complete copy of my curriculum vitae, which includes a list of my publications and contains further details on my education, experience, publications, patents, and other qualifications to render an expert opinion, is provided in Exhibit 1004.

**23.** I have reviewed the '040 patent, and relevant excerpts of the prosecution history of the '040 patent. Based on my experience and education, and the acceptance of my publications and professional recognition by societies in my field, I believe that I am qualified to offer opinions as to the knowledge and level of skill of one of ordinary skill in the art at the time of the invention of the '040 patent (which I further describe below).

### **III. LEVEL OF ORDINARY SKILL IN THE ART**

**24.** I understand there are multiple factors relevant to determining the level of ordinary skill in the pertinent art, including (1) the levels of education and experience of persons working in the field at the time of the invention; (2) the

sophistication of the technology; (3) the types of problems encountered in the field; and (4) the prior art solutions to those problems.

**25.** A POSITA in the field of the '040 patent, as of its earliest possible priority date of March 28, 2006<sup>1</sup>, would have been someone knowledgeable and familiar with using 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 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. Additional work experience can substitute for specific educational background, and vice versa.

**26.** For purposes of this Declaration, in general, and unless otherwise noted, my statements and opinions, such as those regarding my own experience and what a POSITA would have understood or known generally (and specifically related to the references I consulted herein), reflect the knowledge that existed in the relevant field as of the priority date of the '040 patent.

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<sup>1</sup> I have been asked to apply March 28, 2006 as the priority date for the purposes of my analysis.

#### **IV. RELEVANT LEGAL STANDARDS**

27. I am not an attorney. In preparing and expressing my opinions and considering the subject matter of the '040 patent, I am relying on certain basic legal principles that Apple's counsel has explained to me.

28. I understand that prior art to the '040 patent includes patents and printed publications in the relevant art that predate the priority date of the '040 patent. For purposes of this Declaration, I am applying March 28, 2006, as the priority date of the '040 patent.

29. I have been informed by Apple's counsel that a claimed invention is unpatentable under 35 U.S.C. § 103 if the differences between the claimed invention and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a POSITA. I have also been informed by Apple's counsel that the obviousness analysis considers factual inquiries, including the level of ordinary skill in the art, the scope and content of the prior art, and the differences between the prior art and the claimed subject matter.

30. I have been further informed by Apple's counsel that there are several recognized rationales for combining references or modifying a reference to show obviousness. These rationales include: (a) combining prior art elements according to known methods to yield predictable results; (b) simple substitution of one known element for another to obtain predictable results; (c) use of a known technique to

improve a similar device (method, or product) in the same way; (d) applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; (e) choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; and (f) some teaching, suggestion, or motivation in the prior art that would have led a POSITA to modify the prior art or to combine prior art teachings to arrive at the claimed invention.

## **V. BACKGROUND**

**31.** 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. For example, each base station generally broadcasts a signal used by mobile devices to detect nearby base stations. Kraufvelin (Ex.1006), [0079]-[0080]; Putkiranta (Ex.1005), 5:65-6:3. The signal includes a unique identifier, such as a cell ID, for the particular base station to allow mobile devices to identify that base station. Kraufvelin, [0009], [0056], [0060]; Hashimoto, [0135]; Putkiranta, 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. Kraufvelin, [0056], [0060]; Putkiranta, 4:60-5:8. The mobile device may be configured to notify particular computing devices or servers of the cellular network when the set of base stations changes—such as when the mobile

station begins receiving a broadcast signal with a new unique identifier (*e.g.*, when it enters a particular area), or stops receiving one it was previously receiving (*e.g.*, when it leaves a particular area). Kraufvelin, [0060]; Putkiranta, 8:60-65. Cellular network operators collect and store this location information and make it available to authorized external entities to enable location-dependent applications, such as specific call pricing, targeted advertisements associated with the location, and the like. Kraufvelin, [0012]; Putkiranta, 6:13-52.

**32.** 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* TS23.171 standard v.1.0.0 (Ex.1019) (3GPP specification for “location services in UMTS,” dated October 1999); TS23.032 standard v.3.0.0 (Ex.1021) (3GPP specification for a system for “coding of locations,” dated May 1999). As described herein, the ’040 patent simply rehashes “location services” techniques that were well known—and some that were even standardized—well before its earliest alleged priority date (March 28, 2006).

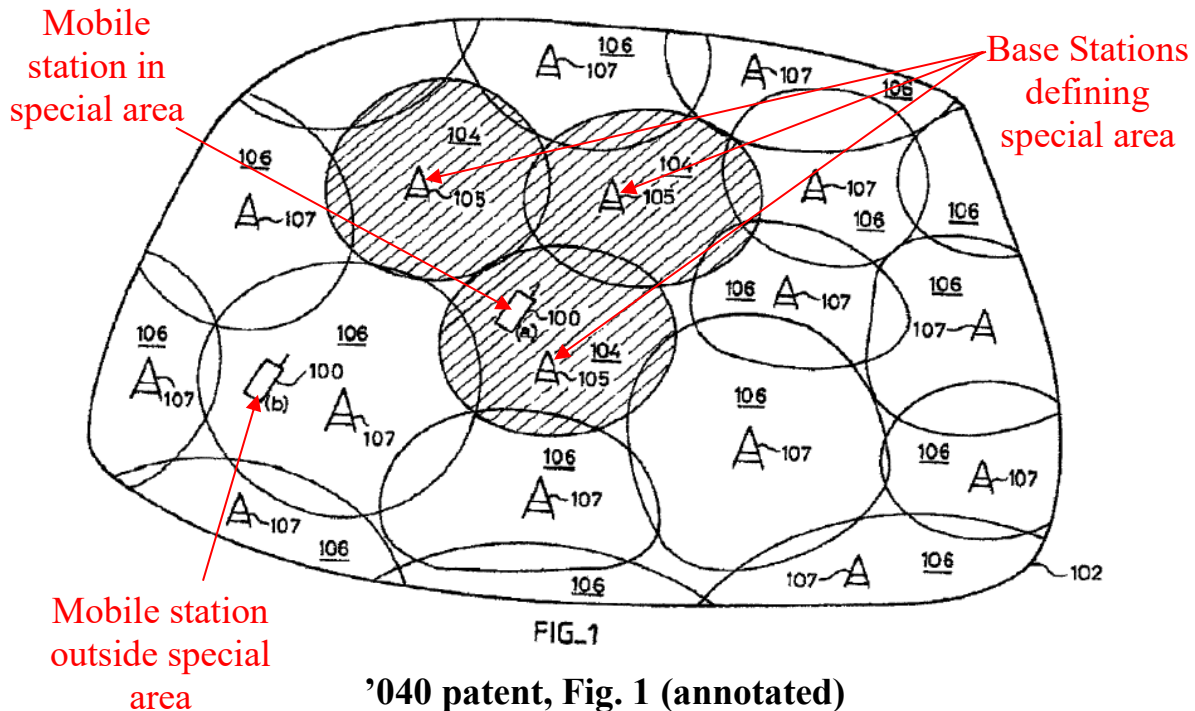
## **VI. THE ’040 PATENT**

**33.** The ’040 patent “relates to a method for monitoring a mobile station presence in a special area” so that services or tariffs can be enabled or disabled on

the mobile station in the special area. Ex.1001 ('040 patent), 1:15-16; 4:18-22 (“In a particular embodiment, the operating parameter is a tariff or a service flag that enables or disables a special tariff or a service for the mobile station. Advantageously, the operator’s services offer can therefore being dependent on the location of the mobile station.”). In particular, the '040 patent aims to “provid[e] the flexibility to the mobile telephone network of associating new special areas for this mobile station in a secure way without modifying any radio transmitting device.” Ex.1001, 2:7-12; 2:44-55 (“Advantageously from the operator's point of view, the invention brings the flexibility needed to activate a special way of operating a mobile station in a special area by transmitting a checking data that will be stored in a mobile station database without having to modify... at least one radio communication defining device.... Therefore, a radio communication defining device is not required to store all the mobile stations identity codes using the special area defined by at least the coverage of its defining signal(s).”). The '040 patent accomplishes this by using a well known technique in which checking data used to determine whether the mobile station is in a special area is stored in the mobile station rather than in a radio communication defining device. Ex.1001, 2:44-55 (describing storing checking data on the mobile station rather than a radio communication defining device); Section V *supra* (explaining how this technology was well known).

34. Specifically, the '040 patent discloses a mobile telephone network that includes various base stations (where “any base station 107 or 105 of a mobile telephone network of an operator is a radio communication defining device”) that “transmit[] a radio defining signal in a channel used by the mobile telephone network.” Ex.1001, 6:6-9. A subset of the base stations transmit a “distinctive radio defining signal” that “compris[es] a special mobile telephone network identification code” such that “[t]he sum of the coverage of these selected base stations 105 defines a special area.” Ex.1001, 6:1-15. The “special mobile telephone network identification code” associated with the base stations defining the special area is stored as “checking data” in the mobile station. Ex.1001, 6:16-17; 6:43-46 (“The checking data (i.e. IC2) is stored into an internal mobile station database included in mobile station 100 storing means, this mobile station 100 being associated to this special area.”). If the mobile station is in the special area, an operator can offer, for example, a lower billing rate to the user of the mobile station. Ex.1001, 7:19-26 (“For example, a mobile telephone network operator can use this embodiment of the invention to offer one set of normal billing rates in an urban environment of a country, and another set of special billing rates for a rural environment.”); *see also* 11:46-51 (“An operator of a mobile telephone network (i.e. the company that operates this mobile telephone network) wishes to propose special billing rates and/or special services to users of its mobile telephone network, each user carrying

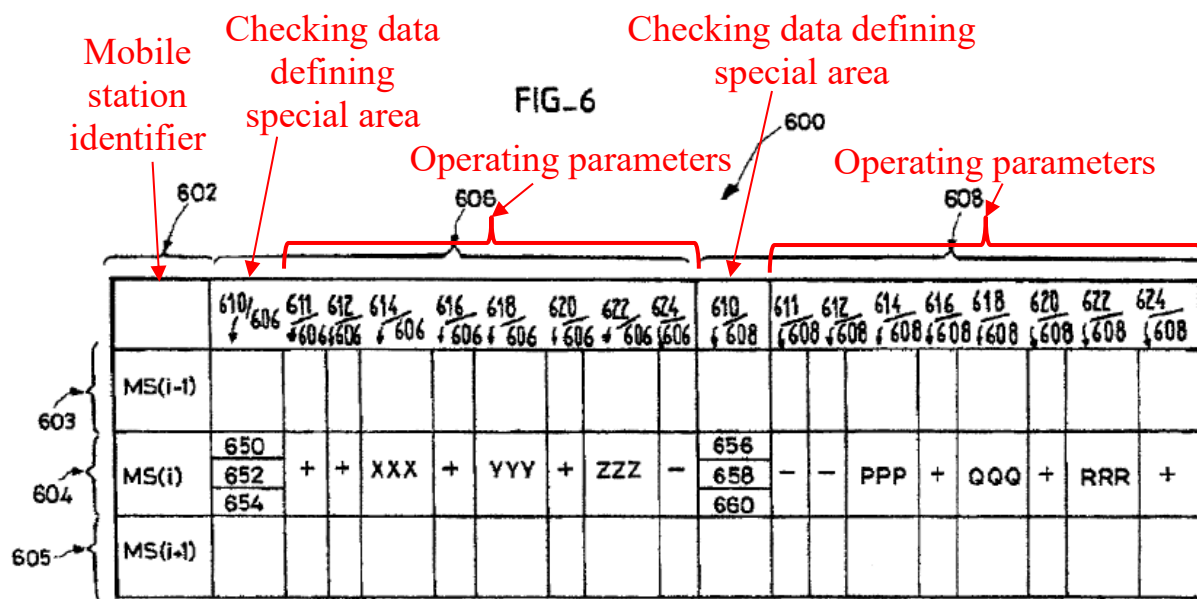
a mobile station, when said users are within special areas of the invention.”). An exemplary mobile telephone network is shown below in Fig. 1 below:



35. The mobile telephone network includes “special operating means...[that] are included in a server and therefore are advantageously centralized and not distributed between each base station of the mobile telephone network.” Ex.1001, 11:41-45. The special operating means includes a “parameters database [that] associate[s] each special area defined with the mobile stations whose presence in such special area is monitored.” Ex.1001, 11:62-65. In particular, “each mobile station identifier is associated with special tariffs and/or services which may be or not available for the mobile station depending on the presence of such mobile station into a given special area.” Ex.1001, 11:65-12:7. The parameters database includes

“operating parameter(s) that may be adapted depending on the presence of the mobile station in one or more special areas at the same time may be notably related to activation or deactivation flags of tariffs and/or services provided to the mobile station by the mobile telephone network.” Ex.1001, 12:8-18.

36. For example, the '040 patent describes an exemplary parameters database 600 shown in Fig. 6 (Ex.1001, 17:54-57):



'040 patent, Fig. 6 (annotated)

37. In particular, the part of the parameters database shown in Fig. 6 includes a column 602 that “comprises the mobile stations identification codes,” which “refers to a code that is associated with the subscription of the mobile station user into the mobile telephone network” such as the “MSISDN.” Ex.1001, 17:62-67. The parameters database also includes “the set of checking data of mobile

“station [*sic*] MS(i) for the special area SA1 606, defined in the column 610/606 of the entry 604,” specifically “the distinctive defining signal of a first base station BS1” and “a checking data 652 comprised into the distinctive defining signal of a second base station BS2.” Ex.1001, 18:1-15. When “the mobile telephone network receives a confirmation of new checking data...from this mobile station confirming that all the checking data corresponding to the special area has been stored,” “the value of column 611/606 for the mobile station MS(i) and for the special area 606 is enabled (‘+’) or disabled (‘-’).” Ex.1001, 18:28-40.

**38.** Thus, “[t]he column 612/606 corresponding to the operating parameter ‘Mobile Station Control Flag’ is enabled (+) or disabled (-) at a given time for the mobile station MS(i) and for the special area SA1 606 depending on the information comprised into the updating signals received about the presence of the mobile station into the special area 606.” Ex.1001, 18:46-54, 18:16-27 (“The mobile station determines that it is located into the special area SA1 606, when it receives at least one of the three identifiers 650, 652, 654 comprised in the distinctive defining signals coming from BS1, BS2 and WD1.”). “When the ‘Mobile Station Control Flag’ is enabled (+) at a given time for the mobile station MS(i) and for the special area 606, certain tariffs or services related to such special area may be available for the user of the mobile station depending on the value (+) or (-) of the corresponding tariff or service flags for Such mobile station and special area into the operating

parameters database.” Ex.1001, 18:55-61. For example, in the part of the parameters database shown in Fig. 6, “at a given time, in the column Tariff identifier 614/606, the parameter is then set at XXX and in the column 616/606, the Tariff Flag is enabled (+). In the column 618/606, the service identifier parameter is then set at YYY and in the column 620/606, the Service Flag of said service YYY is enabled (+). In the column 622/606, the Service identifier parameter is set at ZZZ and in the column 624/606, the Service Flag of said service ZZZ is disabled (-) because service ZZZ is disabled at that time for the mobile station MS(i) and the special area SA1 606.” Ex.1001, 18:61-19:4; *see also* 19:5-19 (“The set of columns 610/608 to 624/608 provides the same kind of information for the special area SA2 608.”).

**39.** The '040 patent indicates that “a part of the special operating means that allow or forbid the provision of [a] service or multimedia content depending on whether or not the mobile station is into the special area...may be operated by the mobile telephone network operator or by a different provider.” Ex.1001, 4:23-30; 19:20-24 (“In another embodiment of the invention, the special operating means are distributed into different servers of the mobile telephone network or of service providers associated with the mobile telephone network and an updating signal may be sent to any of those servers.”).

**40.** Therefore, the mobile station monitors the defining signals from the base stations as it moves through the network and compares the identification code

received from the base station to the stored checking data. Ex.1001, 15:16-27 (“In step 512, the mobile station decide if it receives a defining signal (possibility 516) or not (possibility 514) after observing and processing any signal received.”). “If the mobile station is...inside the special area, the mobile telephone network identification code received is equal to [the stored checking data] and therefore the mobile station 100 determines that it is into the special area.” Ex.1001, 6:48-60; *see also* 15:27-35 (“Then, in step 520...the mobile station decides whether (possibility 524) or not (possibility 522) the defining signal received is a distinctive defining signal that defines a special area for this mobile station, therefore validating or not the defining signal received as a distinctive defining signal.”).

**41.** When the mobile station determines that it is in the special area, it “sends and [*sic*] updating signal to the mobile telephone network about its presence in the special area.” Ex.1001, 16:14-16. This updating signal may be sent to the special operating means of the server via various channels in the mobile telephone network. Ex.1001, 15:54-56 (“The updating signal may be sent through a diversity of channels provided by the mobile telephone network.”). The special operating means then “adapt the operation parameters of the special areas database” based on the updating signal and “send an acknowledgement” to the mobile station. Ex.1001, 16:52-64 (“When the acknowledgment is received (possibility 531) into the mobile station, the mobile station knows in step 534 that the special operating means will

make the appropriate adaptations in the operating parameters of the special areas database.”); 17:4-14 (similar). Then, “the mobile telephone network may enable or disable to the mobile station to use predetermined services depending on the presence of the mobile station into a special area.” Ex.1001, 17:15-18.

**42.** However, “[i]f the acknowledgement is not received in the mobile station (possibility 532) because the updating signal does not reach the special operating means or the mobile station detects a failure in the transmission of the updating signal or there is a failure in the transmission of the acknowledgment, then the mobile station may send the updating signal again.” Ex.1001, 16:44-51.

**43.** Additionally, “the mobile telephone network sets the values of the operating parameters managed in the parameters database to a set of initial values when the mobile station is switched off (as at that time it is not present in any special area) in order to start operating the mobile station when it is just switched on.” Ex.1001, 14:66-15:4.

**44.** Moreover, the ’040 patent explains that “the operator can modify a special area” stored in the mobile station. Ex.1001, 14:5-8. First, the operator “defines such modified special area,” by, for example, adding checking data to the previous checking data or by erasing the previous checking data and adding new checking data. Ex.1001, 14:8-22. Then, “the operator updates the parameters database in order to include, if known, the new checking data associated to the

mobile station and the modified special area.” Ex.1001, 14:23-27. Next, the special operating means then “send...the new checking data to the mobile station using the mobile telephone network” so that it can be stored in the memory of the mobile station. Ex.1001, 14:32-36. Finally, the mobile station stores the new checking data, thereby modifying the special area in the storage of the mobile station.” Ex.1001, 14: 32-36 (“Once the new checking data has been successfully stored into the part of the internal mobile station database that contains the checking data linked to the special area that has to be modified, a confirmation of modification of checking data is sent to the parameters database.”).

## **VII. CLAIM CONSTRUCTION**

**45.** It is my understanding that in order to properly evaluate the ’040 patent, the terms of the claims must first be interpreted. It is my understanding that for the purposes of this *inter partes* review, the claims are to be construed under the so-called *Phillips* standard, under which claim terms are given their ordinary and customary meaning as would have been understood by a POSITA in light of the specification and prosecution history, unless the inventor has set forth a special meaning for a term. I have also been informed that claim terms only need to be construed to the extent necessary to resolve the obviousness inquiry. I have reviewed the entirety of the ’040 patent, as well as its prosecution history. It is my opinion

that, at this stage, no claim term requires express construction other than the “means” terms identified below.

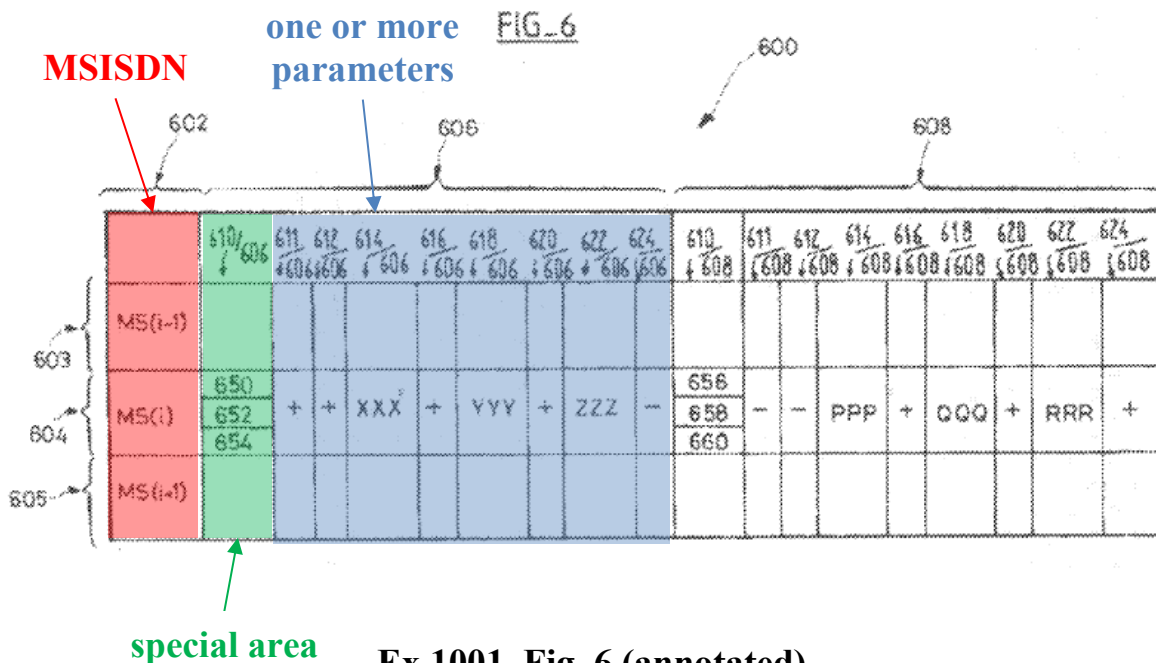
46. I understand that some claim terms may be construed as “means-plus-function” terms under 35 U.S.C. § 112 ¶ 6, meaning that the subject matter of the term is defined by function rather than structure. The following terms recite the term “means.” I understand that the use of the term “means” is presumed to invoke a means-plus-function construction.

**A. “*special operating means*” ([1.7], [11.2])**

47. The function of *special operating means* recited at limitations [1.7] and [11.2] includes adapting the value of at least one operating parameter taking into account the presence of the mobile station in each of the special areas.

48. The structure disclosed by the '040 patent specification that performs the function of limitations [1.7] and [11.2] includes at least one server storing a database linking a special area, a mobile station, and one or more parameters. Ex.1001, 5:8-15, Fig. 6. The specification describes that the above-described function of the special operating means is performed by a server storing the above-described database and adapting at least one parameter. Ex.1001, 5:8-15. The at least one parameter is adapted depending on information received from the mobile station. Ex.1001, 17:54-19:19.

49. Figure 6 illustrates the database stored on the at least one server. An annotated version of Figure 6 is shown below.



50. The database shown above in Figure 6 links the mobile station (MSISDN number, Ex.1001, 17:62-63) to the special areas (base station or wireless device ID codes, Ex.1001, 18:1-15) and one or more parameters, Ex.1001, 18:28-19:4). The '040 patent explains that any of the one or more parameters, identified above, may be adapted, i.e., “enabled (+) or disabled (–)...depending on” information received from the mobile station. Ex.1001, 18:16-19:19.

51. I understand that the corresponding structure also includes equivalents of the disclosed structure.

**B. “*observing means*” ([11.5], [13.1])**

**52.** The function recited at limitation [11.5] includes observing at least one channel.

**53.** The structure disclosed by the '040 patent specification that performs the function of limitation [11.5] includes a processor that executes software for observing at least one channel.

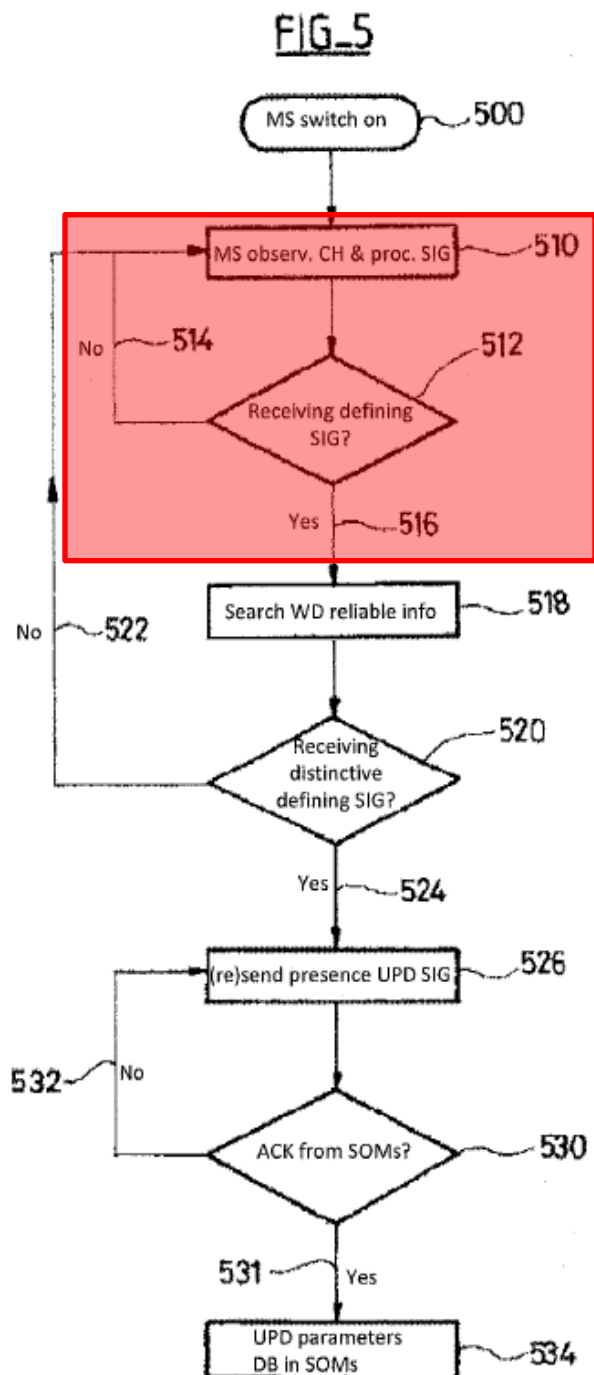
**54.** The function recited at limitation [13.1] includes observing a channel and processing any received signal to determine whether or not a defining signal is received.

**55.** The structure disclosed by the '040 patent specification that performs the function of limitation [13.1] includes a processor that executes software for observing a channel and processing any received signal to determine whether or not a defining signal is received.

**56.** Consistent with conventional mobile stations at the time, the '040 patent explains that a mobile station has “a processor” that executes “special software” and “applications.” Ex.1001, 19:38-53, 12:31-40. These applications may be “available to the mobile station MS(i) when it is into the special area.” Ex.1001, 19:38-53, 22:41-45, 12:31-40, 12:48-52, 12:59-60.

**57.** For example, the mobile station's processor may execute an algorithm for performing the function of observing a channel and processing any received

signal, as illustrated in steps 510, 512, 514, and 516 of Figure 5 below. Ex.1001, 15:5-10, 15:20-22, 12:31-40, 12:48-52, 12:55-60, 19:38-53, 22:41-45.



**Ex.1001, Fig. 5 (annotated)**

**C. “*processing means*” ([11.6])**

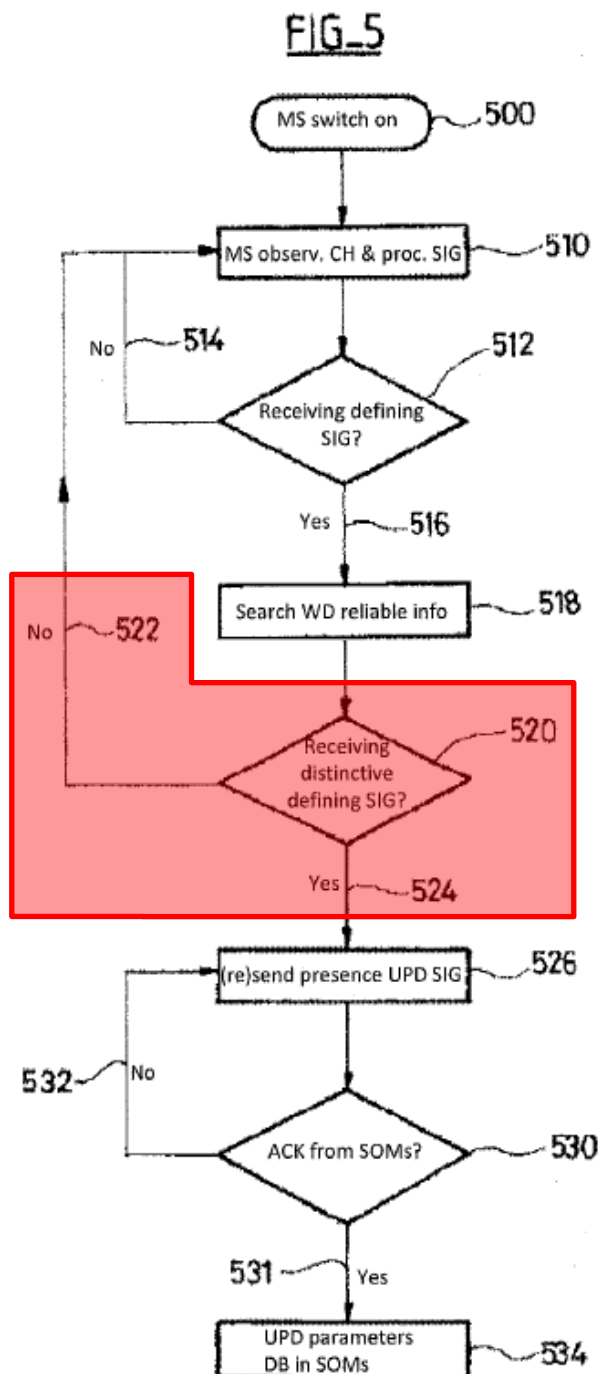
**58.** The function recited at limitation [11.6] includes processing any received signal in order to determine whether or not a signal received is a defining signal and determining based on checking data whether or not the signal received is a distinctive defining signal and whether or not the mobile station is present in a special area.

**59.** The structure disclosed by the '040 patent specification that performs the function of limitation [11.6] includes a processor that executes software for performing the above-described function.

**60.** As explained above, the mobile station of the '040 patent includes “a processor” that executes “special software” and “applications.” Ex.1001, 22:41-45, 12:31-40, 12:48-52, 12:59-60, 19:38-45, 19:50-53.

**61.** The '040 patent also explains that its mobile station executes an algorithm including those recited by steps 520, 522, and 524 of Figure 5 below. The algorithm for performing the method below, including steps 520, 522, and 524, is one of the special software and applications recited by the '040 patent. For example, at steps 522 and 524, “the mobile station decides whether (possibility 524) or not (possibility 522) the defining signal received is a distinctive defining signal that defines a special area for this mobile station, therefore validating or not the defining signal received as a distinctive defining signal.” Ex.1001, 15:37-41. These steps of

the algorithm are shown below in Figure 5 and are executed by the processor of the mobile station in the '040 patent. Ex.1001, 15:37-41; *see also* Ex.1001, Fig. 5, 12:31-40, 12:48-52, 12:55-59, 15:37-41, 19:38-45, 19:50-53, 22:41-45.



**Ex.1001, Fig. 5 (annotated)**

**D. “*transmission means*” ([11.7])**

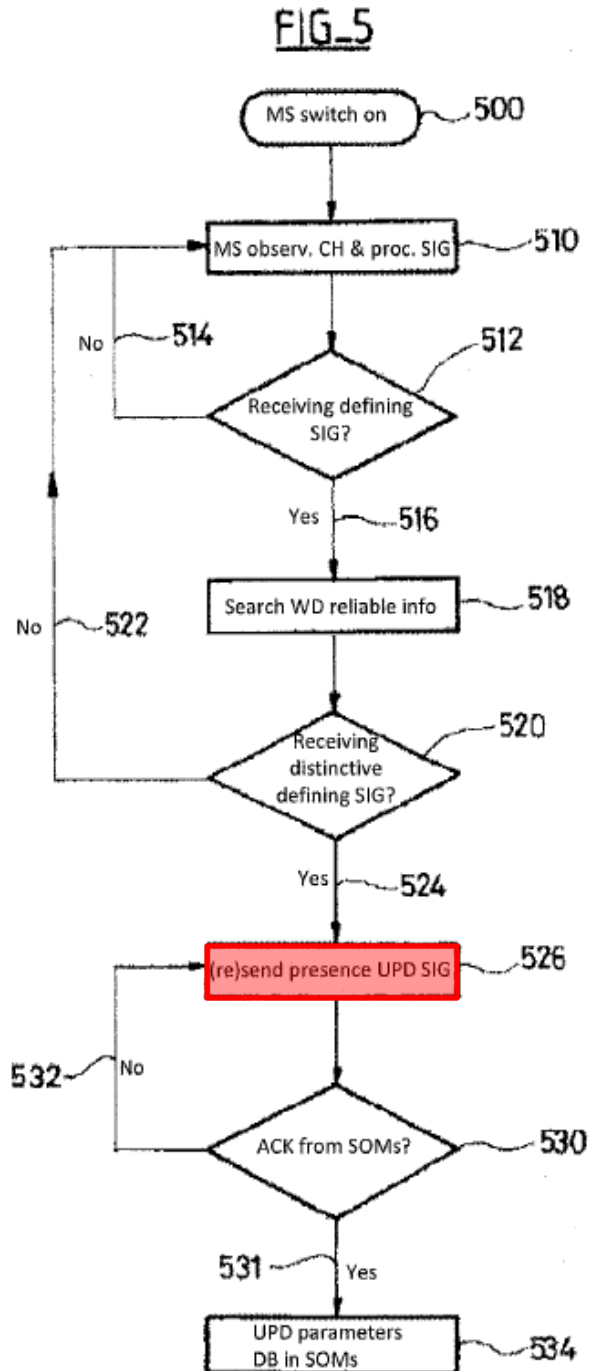
**62.** The function recited at limitation [11.7] includes sending, at least one of (i) periodically, (ii) when the mobile station enters into or exits from a special area, and (iii) when the mobile station remains into a special area, an updating signal.

**63.** The structure disclosed by the '040 patent specification that performs the function of limitation [11.7] includes a transmitter and a processor that executes software for performing the above-described function.

**64.** The '040 patent describes a transmitter. *See* Ex.1001, Figs. 1-3 (illustrating mobile stations including antennas).

**65.** As explained above, the mobile station includes “a processor” that executes software. Ex.1001, 22:41-45, 12:31-40, 12:48-52, 12:59-60, 19:38-45, 19:50-53.

**66.** The processor executes an algorithm for sending an updating signal, as illustrated by step 526 of Figure 5 below: “the mobile station sends an[] updating signal to the mobile telephone network about its presence in the special area.” Ex.1001, 15:54-56.



**Ex.1001, Fig. 5 (annotated)**

67. In addition, the algorithm executed by the processor may configure the mobile station to transmit the updating station when “the mobile station has recently

entered or remains locating into the special area,” “periodically.” Ex.1001, 17:44-49, 15:57-61.

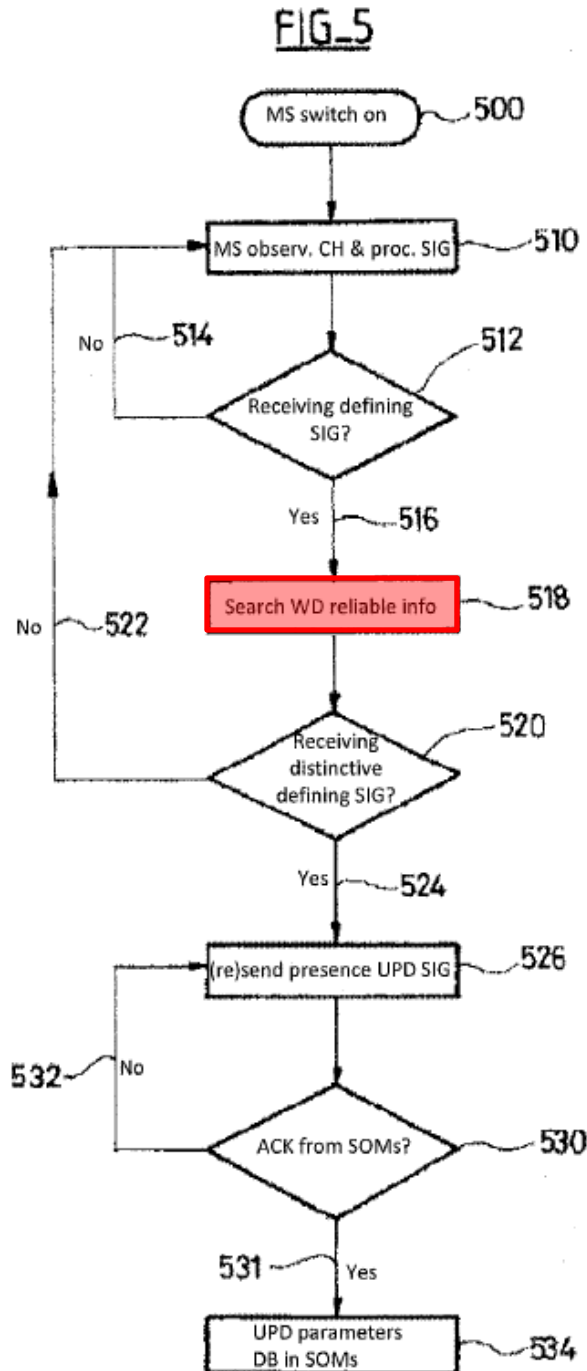
**E. “*special area location monitoring means*” (claim 12)**

**68.** The function recited at claim 12 includes monitoring the correct location of at least a part of one or more special areas.

**69.** The structure disclosed by the '040 patent specification that performs the function of claim 12 includes a processor that executes software for performing the above-described function.

**70.** As explained, the mobile station includes “a processor” that executes software. Ex.1001, 22:41-45, 12:31-40, 12:48-52, 12:59-60, 19:38-45, 19:50-53.

**71.** The mobile station’s processor executes an algorithm for performing the function of monitoring the correct location of a special area by searching “reliable information” which confirms whether “the wireless device is effectively located into a predetermined environment.” Ex.1001, 15:28-35, 5:19-24, 5:28-35. This function is illustrated at step 518 of the method in Figure 5, shown below. This function of step 518 is executed by the processor executing an algorithm corresponding to the function.



Ex.1001, Fig. 5 (annotated)

## VIII. THE CHALLENGED CLAIMS ARE UNPATENTABLE

72. The discussion in this Declaration provides a detailed analysis of how the asserted prior art references teach each limitation of the Challenged Claims.

73. As part of my analysis, I have considered, and discuss in detail, the scope and content of the prior art and any differences between the alleged invention and the prior art.

74. It is my opinion that the alleged invention recited in the Challenged Claims would have been obvious in view of the teachings of the asserted prior art and the knowledge of a POSITA before the time of the alleged invention of the '040 patent.

**IX. GROUND 1: CLAIMS 1-2, 5-8, 10-14 ARE UNPATENTABLE AS OBVIOUS OVER THE COMBINATION OF KRAUFVELIN, HASHIMOTO, AND ANDERSSON**

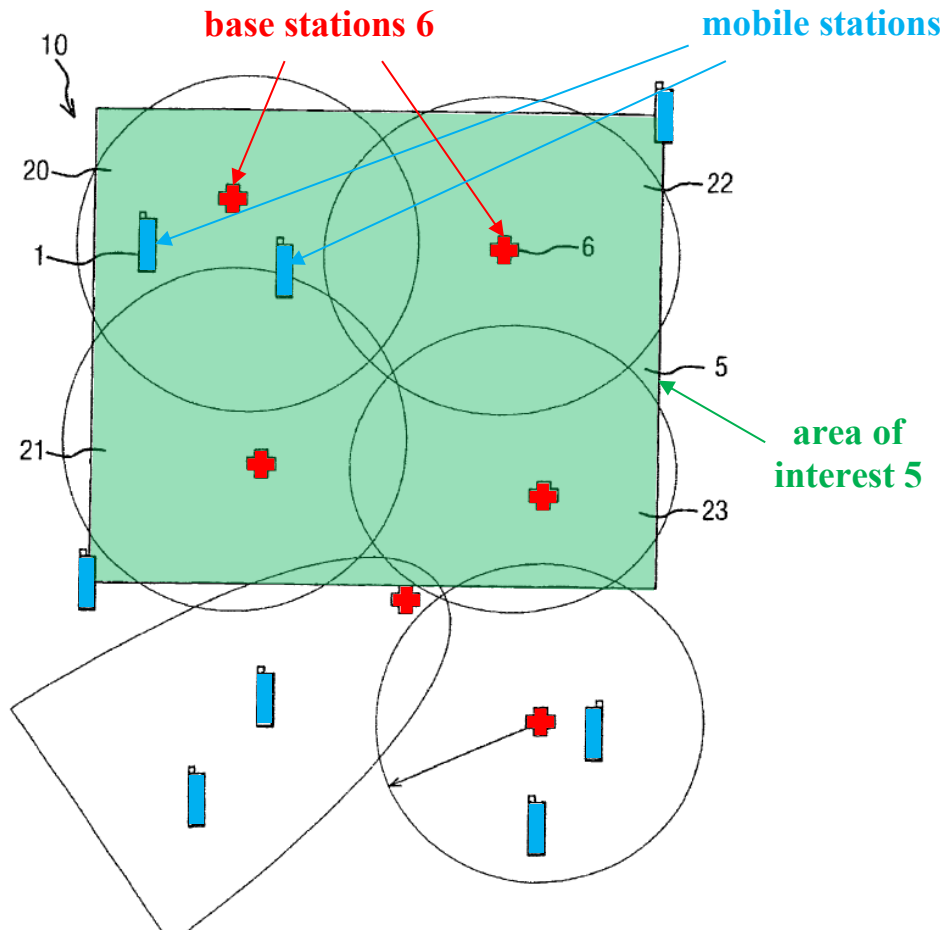
**A. Summary of Kraufvelin**

75. Kraufvelin is a patent publication that describes systems and methods for providing information regarding the location of a mobile phone, referred to as a mobile station, to a client. Specifically, Kraufvelin describes “monitoring...a change in the presence status of a target mobile station relative to an area of interest.” Kraufvelin, [0023].

76. In Kraufvelin, a client, referred to as the “LCS Client 8,” sends a request to the system to begin monitoring the presence of a particular mobile station in relation to an area of interest. *See* Kraufvelin, [0063]. Kraufvelin describes this monitoring process with Figure 2 below. Mobile stations (highlighted in blue) move through coverage areas (circles) of base stations 6 or cells (highlighted in red). The

base stations of cells 20-23 form an area of interest 5 (highlighted in green).

Kraufvelin, [0040]-[0041], [0053].



### Kraufvelin, Detail of Fig. 2 (annotated)

77. As mentioned above, the area of interest 5 is chosen by the client 8, which “makes a request...for information that concerns one or more of the mobile stations.” Kraufvelin, [0048]. In the example of Figure 2, above, the rectangular shape of the area of interest 5 is an area chosen by the client, and the client wishes to be informed when a particular mobile station enters, exits, or is otherwise present

in the area of interest. *See* Kraufvelin, [0063]. To do so, “[t]he request indicates a geographical area of interest and the target subscriber.” Kraufvelin, [0055].

**78.** The system receives the shape from the client and converts it into a list of cell IDs corresponding to the cells within the area of interest 5. “The geographical area” is “translated into a list of Cell Ids.” Kraufvelin, [0056]. “In FIG. 2 the area 5 is shown to be covered by the cells 20 to 23. The IDs of these cells would thus be included in the list.” Kraufvelin, [0056].

**79.** The mobile station that is to be monitored is provisioned with the list of cell IDs. “The list of cells may then be sent to the mobile station 1.” Kraufvelin, [0060]. When the mobile station moves into a new cell, it receives the cell ID of the new cell and “check[s] the new Cell ID against the list.” Kraufvelin, [0060]. “If there is [a] match, the mobile station 1 sends a report back to the network.” Kraufvelin, [0060]; *see also* [0079]-[0080], [0046] (sending “[a]n area event [location services] LCS report indicating” the mobile station’s location). Kraufvelin’s method of providing the list of cell IDs to the mobile station for storage by the mobile station advantageously allows the system to define areas of interest specific to that mobile station and not applicable to other mobile stations within the network. For example, the mobile station that is to be monitored by the system contains the list of cell IDs and, thus, recognizes entrance into cell 20, for example, as entering the area of interest 5. Other mobile stations, however, that are not provisioned with the same

list of cell IDs may enter the cell 20 and not recognize the cell as belonging to an area of interest. Thus, multiple different areas of interest may be provisioned and associated with multiple different mobile stations. This method thus allows for monitoring the location of mobile stations “without causing excessive load into the resources of the communication network.” Kraufvelin, [0012].

80. Kraufvelin also explains that the purpose of implementing such a method may be to provide particular services to mobile stations within the area of interest. For example, Kraufvelin explains that its methods of monitoring the location of a mobile station may be used to provide “**[d]ifferent kinds of services**” such as “various commercial and non-commercial services and similar applications” including “send[ing] information and/or offer[ing] services to a mobile station only in a particular defined geographic area.” Kraufvelin, [0012]. These services may include “push services like advertisements and parents monitoring the whereabouts of their children.” Kraufvelin, [0012]. Because Kraufvelin describes some examples of services that could be provided, a POSITA would have recognized that any type of service may be provided to a mobile station based on its location within the area of interest 5, based on the teachings of Kraufvelin, and would have been very familiar with the types of services that could be provided (e.g., different tariffs, access to an application, service or function, etc.). *See* Kraufvelin, [0012].

**B. Summary of Hashimoto**

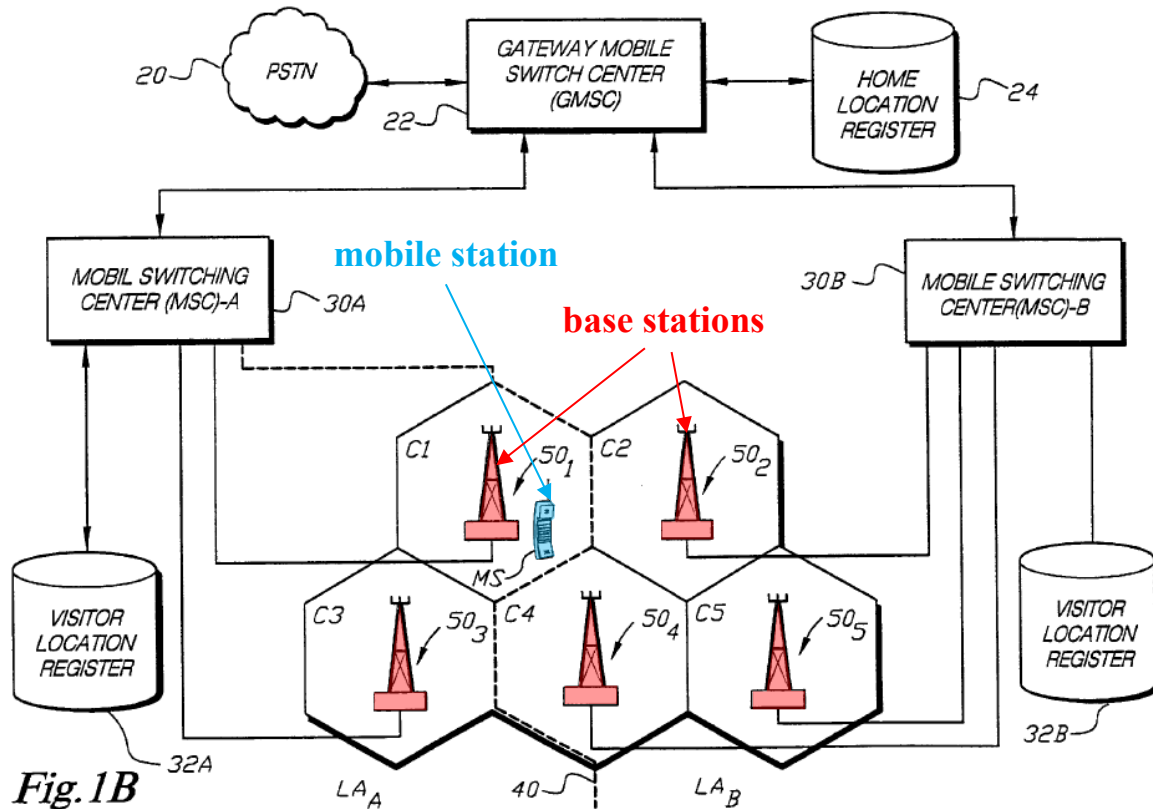
**81.** Hashimoto is a patent publication describing various aspects of handover procedures in a conventional cellular telecommunications system, concepts with which a POSITA would have been familiar. Hashimoto describes a mobile station that, when entering a new cell, receives the new cell ID of the cell and “transmits a location updating request” to the network. Hashimoto, Abstract. Hashimoto also describes various methods by which a mobile station may be registered to a particular base station or may determine to communicate with one particular base station over another. *See* Hashimoto, [0014]-[0017].

**82.** Hashimoto explains that to facilitate a handover of the mobile station from one base station to another, cellular base stations “periodically transmit[] system information called ‘broadcast information’ over a channel called ‘BCCH’.” Hashimoto, [0135]. The broadcast information includes “the identification information (ID) of a cell called ‘Cell-ID.’” Hashimoto, [0135]. Hashimoto contemplates that this cell ID may also be any other identification code, value, or parameters, such as any other location area identifier. Hashimoto, Abstract.

**C. Summary of Andersson**

**83.** Like Kraufvelin, Andersson describes monitoring the location of a mobile station (highlighted in blue in the figure below) as it moves between the

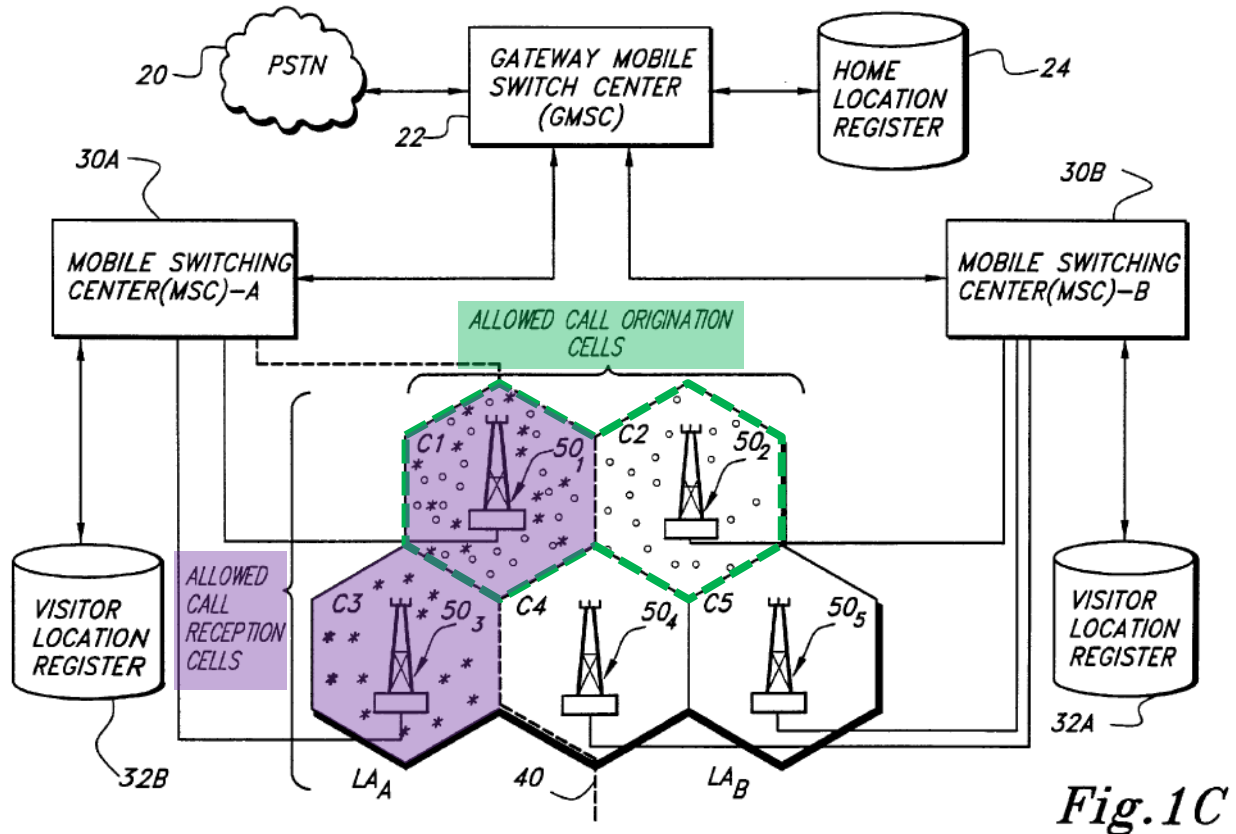
coverage areas of different base stations, or cells (highlighted in red in the figure below) relative an area of interest. Andersson, Figs. 1A-1C, 2:52-57, 6:67-7:2.



Andersson, Fig. 1B (annotated)

84. Andersson also provides an example in which multiple areas of interest may be defined for a particular mobile station. For example, as shown in Figure 1C below, Andersson explains that the mobile station may only place calls in cells C1 and C2 (highlighted in green) and may only receive calls in cells C1 and C3 (highlighted in purple). Andersson, 7:63-8:1. Andersson refers to this restriction as a “hard restriction.” Andersson, 6:63-7:7. Andersson also describes a “soft

restriction” in which different tariffs rates are applied to the mobile station in preconfigured areas. Andersson, 8:52-67.



Andersson, Fig. 1C (annotated)

85. Andersson explains that databases are maintained by the network for monitoring the mobile station’s location, as well as the services or tariffs applied to the mobile station based on its location. For example, in Figure 2A, Andersson describes a “record 100A” indicating:

- the mobile station identity (MSISDN 102/IMSI 104),
- the mobile station location (current VLR address 106),

- the area of interest (allowed cells list 112), and
- the services authorized and/or tariffs applied to the mobile station in the area (restriction control 110). Andersson, 5:16-24, 5:45-57.

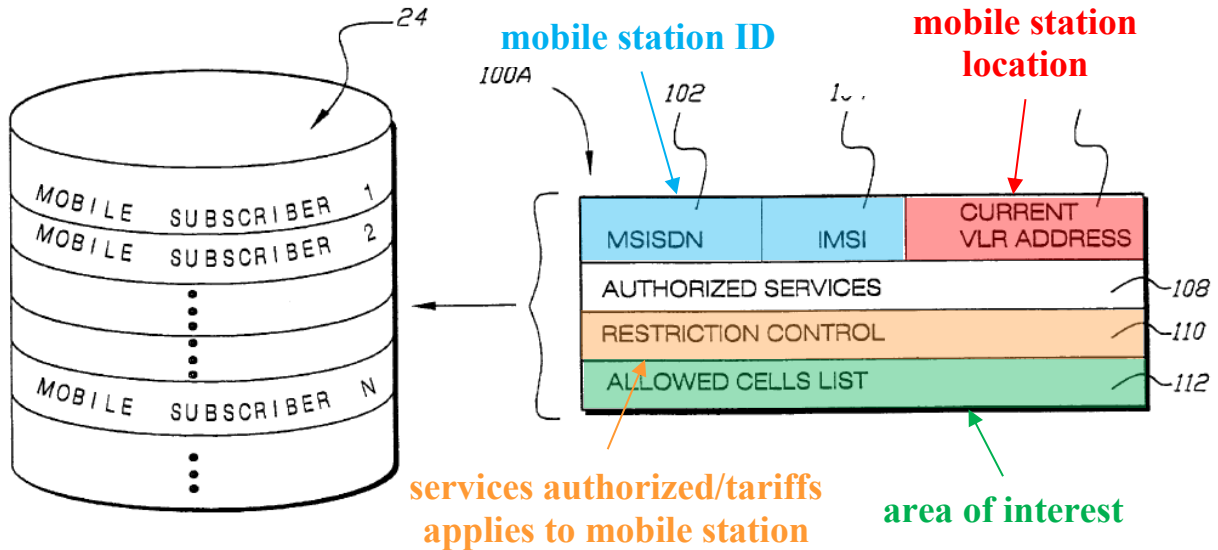


*Fig.2A*

Andersson, Fig. 2A (annotated)

86. In Figures 2A-2D, Andersson adds that the restriction control 100 includes a “flag” that “indicates that mobile subscriber N is to be accorded a low tariff” when in the special areas listed in allowed cells list field 112. Andersson, 5:49-60, 8:52-67, Fig. 2A, 2D.

**D. The Combination of Kraufvelin, Hashimoto, and Andersson**

**87.** A POSITA would have recognized that the teachings of Kraufvelin, Hashimoto, and Andersson could be easily combinable and would have been motivated to combine them, as explained in more detail below.

**1. Implementing transmission of cell IDs by base stations in Kraufvelin's system based on Hashimoto.**

**88.** As explained above, in Kraufvelin, when a mobile station enters the coverage area of a new cell, it checks whether the cell ID of that new cell is included within the prestored list to determine if the mobile station has entered the area of interest 5. *See* Kraufvelin, [0056]-[0060], [0079]-[0080]. Hashimoto provides additional details regarding how the cell ID of the new cell is provided to the mobile station. A POSITA would have recognized these details as conventional steps routinely applied in the implementation of the techniques described by Kraufvelin. In particular, Hashimoto explains that each base station “periodically transmits” its cell ID in the “BCCH” channel of a cellular network. Hashimoto, [0135]. Therefore, in the combination, Kraufvelin's system implements the conventional technique of base stations periodically transmitting their cell IDs based on Hashimoto's teachings.

**2. Storing mobile station presence information in the Kraufvelin-Hashimoto system based on Andersson.**

**89.** The Kraufvelin-Hashimoto combination describes obtaining information regarding a mobile station's presence by transmitting cell IDs to mobile

stations, providing this information to a client, and providing services to the mobile station based on the location. Kraufvelin, [0012], [0079]-[0080]; Hashimoto, [0135]. Andersson describes how the location information is stored, describing databases storing parameters linking a mobile station to a special area and adapting the parameters based on the mobile station location. Andersson, Figs. 2A-2D, 5:20-45. In the combination, the Kraufvelin-Hashimoto system implements the conventional technique of storing parameters linking a mobile station to a special area and adapting the parameters, based on the teachings of Andersson. Andersson, Figs. 2A-2D, 5:20-45. A POSITA would have recognized Andersson's disclosure of databases storing parameters and adapting parameters based on the mobile station's location as conventional methods of implementing a cellular telecommunications system.

**E. Reasons to Combine Kraufvelin, Hashimoto, and Andersson**

**90.** It would have been obvious to a POSITA to combine the teachings of Kraufvelin, Hashimoto, and Andersson.

**1. Kraufvelin, Hashimoto, and Andersson are analogous art.**

**91.** Kraufvelin, Hashimoto, and Andersson are analogous to the '040 patent and in the same field of endeavor of monitoring the location of a mobile station relative to a geographical area. The '040 patent describes "monitoring the presence of a mobile station...in at least one special area" and providing services to the mobile station based on its location within or outside that special area. Ex.1001, Abstract.

Like the '040 patent, Kraufvelin describes “monitoring...a change in the presence status of a target mobile station relative to an area of interest.” Kraufvelin, [0023]. Kraufvelin also explains that services are provided to the mobile station based on the mobile station’s location, provides several examples of services that may be provided, but leaves the specific services open. *See* Kraufvelin, [0012]. Like the '040 patent, Hashimoto monitors the location of a mobile station based on transmitted cell IDs. Hashimoto, Abstract (describing “location updating request”). Like the '040 patent, Andersson describes monitoring a mobile station’s location and providing services and/or reduced tariffs to the mobile station based on its location, explaining details of how various data and parameters of the mobile station are maintained by the system. Andersson, Figs. 2A-2D, 8:52-67; Ex.1001, Abstract, 6:56-65.

**92.** Kraufvelin, Hashimoto, and Andersson are reasonably pertinent to a particular problem with which the inventor was involved, including monitoring the location of a mobile station and providing services based on the determined location. Ex.1001, 1:65-2:3; Kraufvelin, [0056]-[0060], [0012]; Hashimoto, Abstract, [0135]; Andersson, Figs. 2A-2D, 8:52-67.

**2. Implementing transmission of cell IDs by base stations in Kraufvelin’s system based on Hashimoto.**

**93.** In Kraufvelin, a POSITA familiar with basic concepts of cellular networking would recognize that each base station repeatedly broadcasts its cell ID because “[w]hen the UE performs a cell handover,” it “check[s] the details of the

new serving cell, including the cell ID” and “compare[s] the current cell ID or similar against one or more, target cell IDs in the list received.” Kraufvelin, [0079]. To the extent it is argued, however, that explicit disclosure of this conventional step is required, this concept is described in multiple other references, including Hashimoto. Hashimoto, [0135]. A POSITA would have known that cellular base stations repeatedly transmit their assigned cell ID in the BCCH channel because each mobile station that enters a new cell uses the cell ID to identify the new cell. Hashimoto, [0135].

**94.** The concept of a base station repeatedly transmitting its cell ID in a BCCH channel was a conventional implementation detail of cellular networks that a POSITA would have been familiar with, as described by both Kraufvelin and Hashimoto. Both Kraufvelin and Hashimoto are compatible with implementations of the 3G cellular standard. Kraufvelin, [0043] (describing “[t]he third generation (3G) systems” including Kraufvelin’s “base station 6”), [0046], [0054]-[0055] (incorporating by reference several 3G standard documents); Hashimoto, [0013] (listing several 3G standard documents as prior art relevant to Hashimoto).

**95.** Kraufvelin and Hashimoto both explain that multiple mobile stations enter and exit different cells as they move throughout a network, performing handoff procedures as they disconnect from one base station and connect to another. Kraufvelin, Fig. 2, [0047]-[0048] (“one **or more** of the mobile stations”);

Hashimoto, Figs. 1-2 (illustrating mobile stations moving through multiple cells BTS11, BTS12, BTS21, BTS31, BTS41, and BTS42). When mobile stations enter a new cell, A conventional cellular base station repeatedly transmits its cell ID throughout the area of its coverage so that any mobile station that newly enters the cell area receives the cell ID and can recognize the cell into which it has just entered. Hashimoto, [0135]. If the cell ID were not repeatedly broadcast by base stations, mobile stations entering the cell would not be able to identify the cells into which they entered and could not send a location update. Kraufvelin, [0060], [0079]-[0080]; Hashimoto, Abstract (“location updating request”).

**96.** Thus, a POSITA would have been motivated to implement this conventional and well known functionality described by Hashimoto. Doing so would ensure that mobile stations entering a new cell would receive the cell ID of the new cell so they can determine their location and send an updating signal as Kraufvelin describes. Kraufvelin, [0056]-[0060], [0079]-[0083]. Accordingly, the Kraufvelin-Hashimoto combination would have been the combination of prior art elements, including, for example, Kraufvelin’s monitoring the location of a mobile station and Hashimoto’s base stations repeatedly transmitting a cell ID in a BCCH channel. The combination would be made according to known methods, including receiving a cell ID of an area of interest and finding a match within a prestored list of cell IDs. In addition, the combination would yield the predictable result of a mobile station

determining its location and sending a location update, according to conventional standards.

**97.** Further, a POSITA would have expected to successfully combine the conventional teachings of Hashimoto regarding repeatedly transmitting cell IDs from base stations in a cellular network with Kraufvelin's teachings. Kraufvelin explains that when a mobile station enters a new cell, it receives the cell ID from the base station of the new cell. Kraufvelin, [0079], [0056], [0060], [0039]. Hashimoto describes the same feature and simply explains that this process occurs repeatedly so that each terminal may receive "various parameters" of the new cell, such as the "Cell-ID," among others. Hashimoto, [0135]. In addition, both Kraufvelin and Hashimoto describe standardized cellular network components and signals. Kraufvelin, [0043], [0046], [0054]-[0055]; Hashimoto, [0013].

**98.** A POSITA would also have recognized that the concept of base stations repeatedly broadcasting their cell ID throughout their respective coverage areas was conventional because it was described in several 3G standard documents published long before the priority date of the '040 patent. For example, it was commonly known that a base station's cell ID was used by a mobile station to determine its location. *See* TS23.171 standard v.3.10.0, 32 (section 8.7.1.2); TS23.171 standard v.1.0.0, 9-10 (section 4.3). In addition, it was common knowledge that mobile stations use information broadcast from base stations to determine their location. For

example, “[t]he [mobile station] MS with an independent location function may also make use of information broadcast by the UTRAN that assists the function.” TS23.171 standard v.1.0.0, 20 (section 6.3.5); *see also* TS23.271 standard v. 6.4.0, 30 (section 6.3.4). An UTRAN is a base station. *See* Vialen, 1:35-38 (“[B]ase station subsystems (BSS), including radio network controllers (RNC) and base stations (BS), is called a UTRAN (UMTS Terrestrial Radio Access Network).”); Auterinen, [0020] (“UTRAN (UMTS Terrestrial Radio Access Network, ie the base stations and radio network controllers)”). Kraufvelin acknowledges and incorporates by reference these 3G specification documents, showing that these concepts were well known. *See* Kraufvelin, [0010]-[0011], [0043], [0046], [0054]-[0055], [0063]. For all these reasons, a POSITA would have been motivated to combine Hashimoto with Kraufvelin.

**3. Storing mobile station presence information in the Kraufvelin-Hashimoto system based on Andersson.**

**99.** A POSITA would also have recognized that Andersson’s teachings of storing parameters in a database and adapting these parameters based on mobile station location were conventional implementation details. In addition, a POSITA would have been motivated to combine Andersson with the Kraufvelin-Hashimoto combination for several reasons. For example, storing mobile station location-related parameters within a database, as described by Andersson, would advantageously provide centralized management of data, as well as redundancy

ensuring against loss of data due to single network node failure. Andersson, 4:48-51. In addition, storing these parameters in a database would encourage standardization of data, such that more clients would receive and use the data with minimal processing and Andersson specifically identifies ensuring compatibility “with conventional signaling standards.” Andersson, 11:64-67. Kraufvelin explicitly states that implementing a system with minimal modification to the 3G standards is a priority. *See* Kraufvelin, [0055]. The standardization of data afforded by Andersson’s disclosure of databases would, therefore, be a strong motivating factor to a POSITA to implement Andersson’s teachings within Kraufvelin’s system. Storing the data within a database as taught by Andersson would also enable access control, ensuring that only clients or entities within the location monitoring system could access the location-based data, ensuring privacy. Kraufvelin, [0084].

**100.** In addition, Kraufvelin describes providing services based on the mobile station’s location. Kraufvelin, [0012]. Kraufvelin describes the steps of provisioning the mobile device with the information to identify its location relative to the area of interest (list of cell IDs corresponding to the area of interest 5), but does not explicitly describe how the network stores information and what services are provided. A POSITA would have recognized that the details regarding how data is stored on a server were conventional implementation details, and that they are described by Andersson.

**101.** In addition to the previously described advantages of storing parameters in a database, a POSITA would have recognized that Andersson's teachings of a database were conventional for multiple reasons. As explained above, both Kraufvelin and Andersson describe monitoring the location of a mobile station, sending updating signals from the mobile station to a network, and providing services based on the location of the mobile station. Kraufvelin, [0079]-[0083], [0012]; Andersson, 5:41-48, 8:35-56. Thus, a POSITA would have been motivated to combine Andersson with Kraufvelin and Hashimoto in the manner described above. Accordingly, the combination of Kraufvelin, Hashimoto, and Andersson would have been the combination of prior art elements, specifically, Kraufvelin and Hashimoto's teachings of monitoring the location of a mobile station via repeatedly transmitted and stored cell IDs and Andersson's teachings of storing a database including parameters that are adapted based on the location of the mobile station. The combination would have been made according to known methods, including receiving a cell ID of an area of interest and finding a match within a prestored list of cell IDs to determine a mobile station location. A POSITA would also have recognized that the combination yielded predictable results, specifically providing different services or tariff rates to a mobile station based on its location in a special area. Andersson, Figs. 2C-2D, 5:49-60, 8:45-56.

**102.** Further, a POSITA would have expected success in making the combination. A POSITA would have recognized that modifying Kraufvelin to store and update parameters in a database, as taught by Andersson, was a very common aspect of implementing a system. Kraufvelin describes data related to the location of the mobile station in an area of interest 5. Kraufvelin, [0079]-[0082] (contents of updating signal). Kraufvelin also describes providing services to the mobile station based on that location-related data. Kraufvelin, [0012]. Kraufvelin simply leaves open to the reader how this data is stored and updated, e.g., in a database. Andersson describes the same procedures as Kraufvelin, including monitoring the location of a mobile station based on the cell ID of the cell in which the mobile station is positioned, Andersson, 2:46-57, but merely adds additional details regarding how data related to the location of the mobile station is stored and adapted in a database. Andersson, Figs. 2A-2D, 8:35-57. The Kraufvelin-Hashimoto system would utilize Andersson's database technique as intended and in the same context. For all these reasons, a POSITA at the time would have been motivated to combine Andersson with Kraufvelin and Hashimoto.

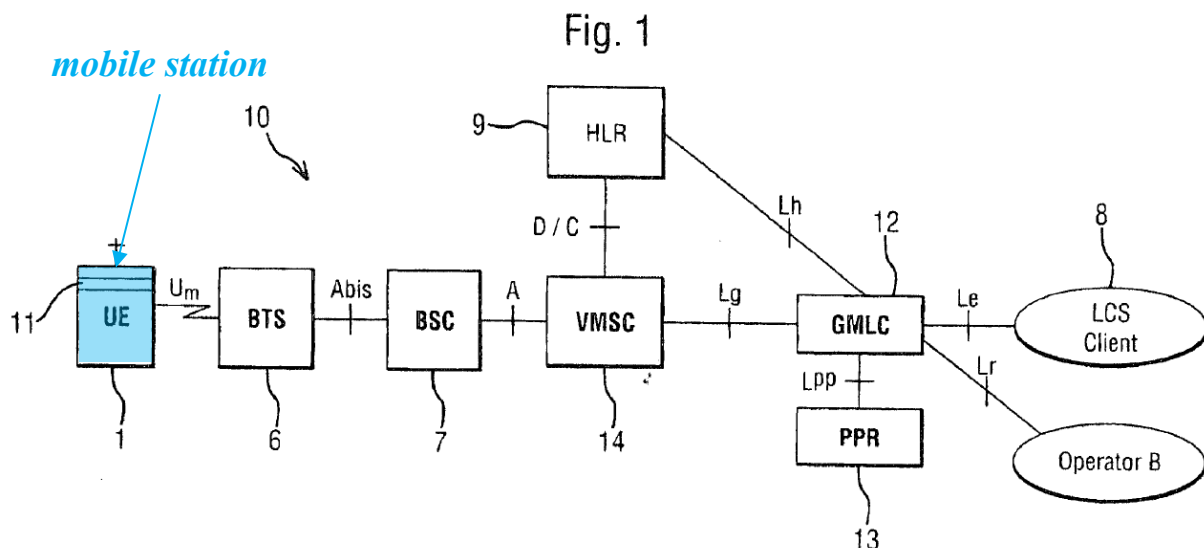
## F. Detailed Analysis of Claims

### 1. Claim 1

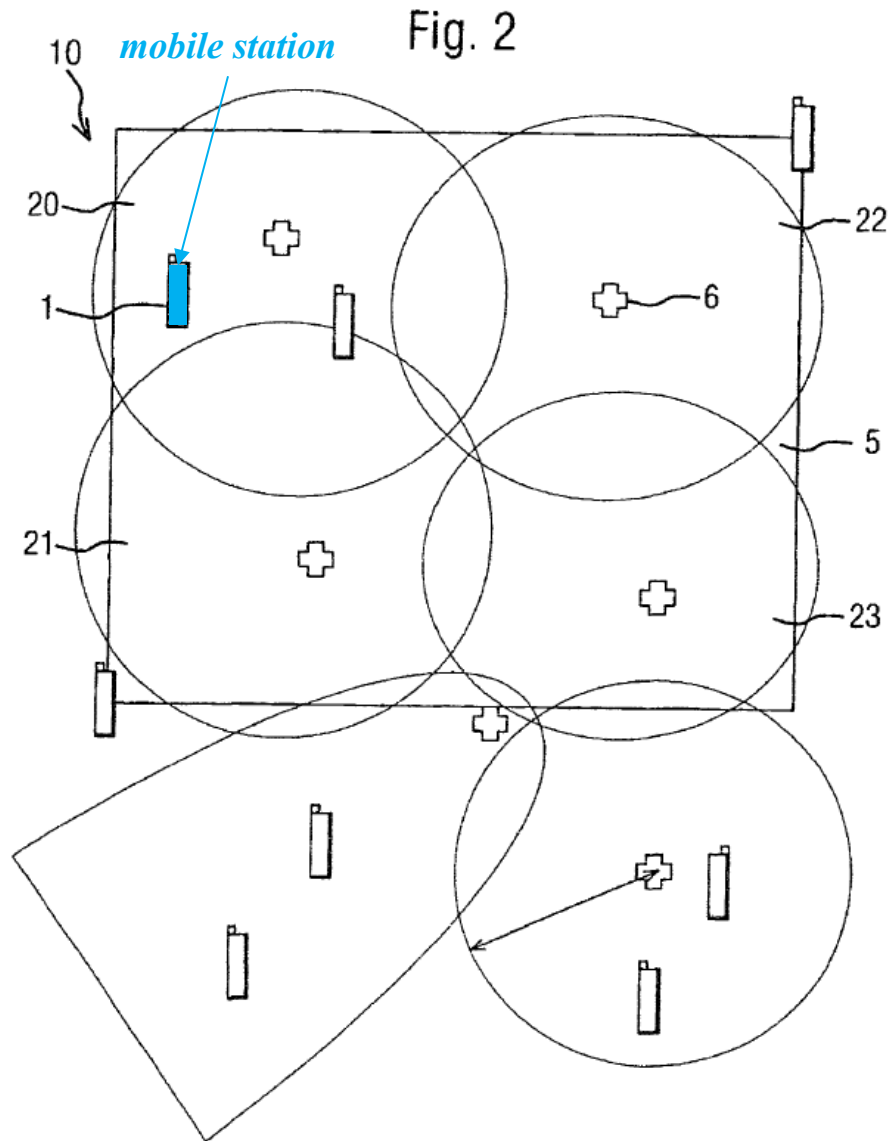
- a. [1.0] *A method for monitoring the presence of a mobile station in one or more special areas associated with the mobile station, the method comprising:*

103. Kraufvelin “provide[s] a system and method [that] provide information regarding the presence status of a mobile station relative a geographical area of interest,” which renders obvious *[a] method for monitoring the presence of a mobile station in one or more special areas associated with the mobile station*. Kraufvelin, [0029], [0053].

104. Kraufvelin’s “mobile station 1,” or “user equipment” (UE) is illustrated in Figures 1, 2, and 4. Kraufvelin, [0048], [0041].



Kraufvelin, Fig. 1 (annotated)



**Kraufvelin, Fig. 2 (annotated)**

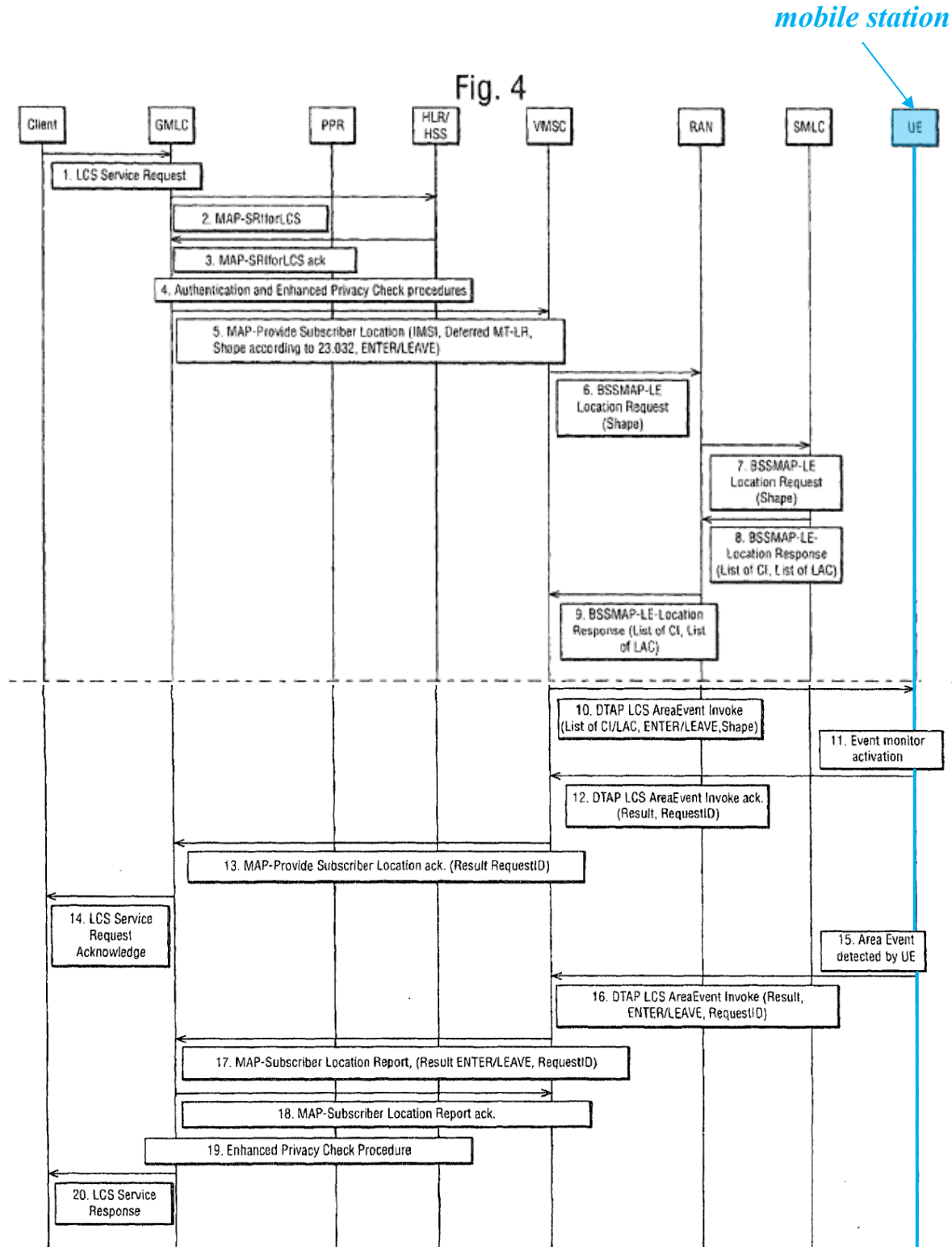
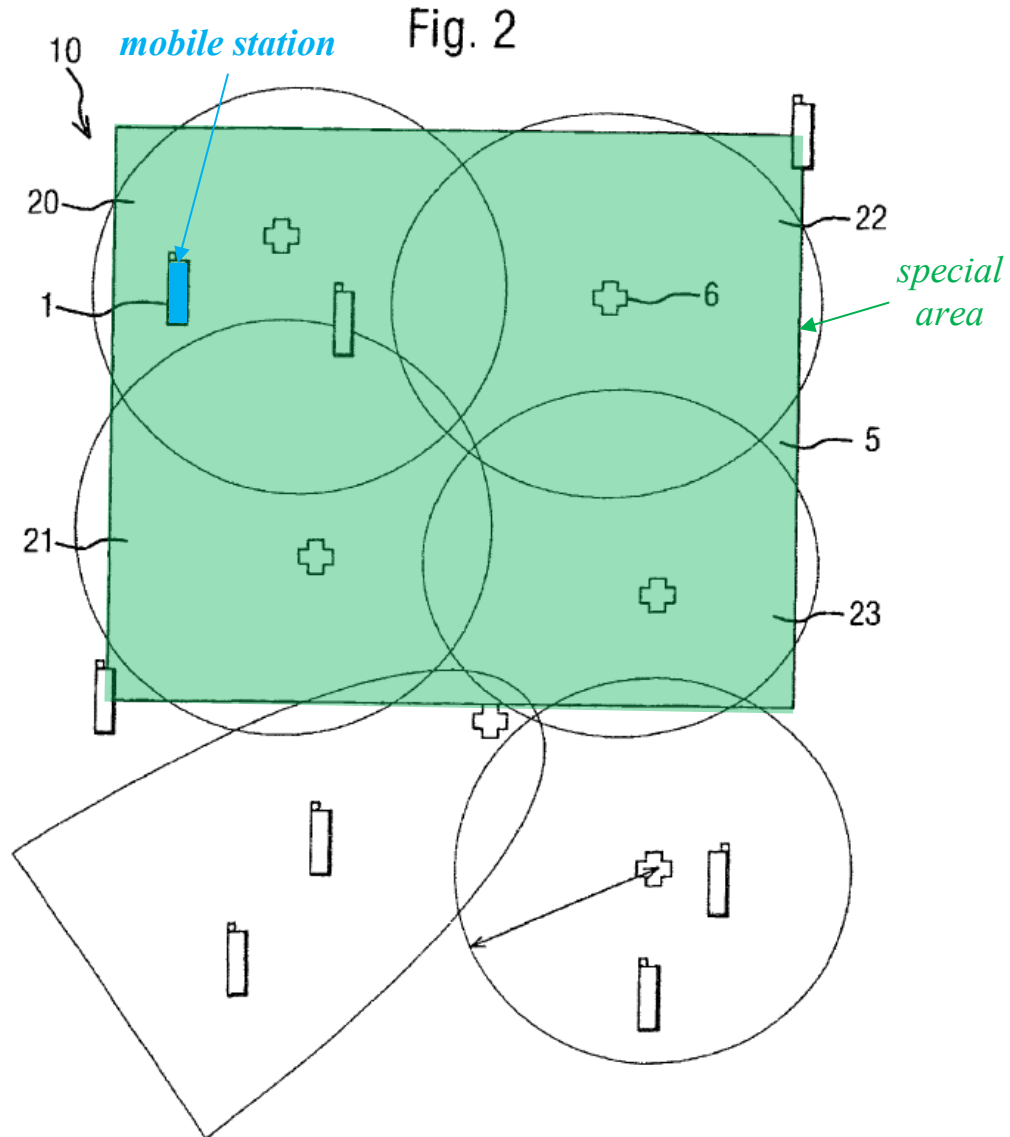


Fig. 4 (Contd.)

Kraufvelin, Fig. 4 (annotated)

**105.** The location of the mobile station 1 location is monitored in “an area of interest 5,” which renders obvious *one or more special areas*, shown below in green. Kraufvelin, [0017]. As explained above, the area of interest 5 is specified by an LCS client 8. *See* Kraufvelin, [0063].



**Kraufvelin, Fig. 2 (annotated)**

**106.** The area of interest 5 described by Kraufvelin is *associated with* the mobile station 1 because the “request” from the client 8 for location monitoring services specifies both the mobile station 1 and the area of interest 5. Kraufvelin, [0048]. In more detail, Kraufvelin’s system receives a location-monitoring request from the “LCS client 8” which may be any “logical functional entity that makes a request to the GMLC node 12 for information that concerns one or more of the mobile stations.” Kraufvelin, [0048]. The LCS Client 8 “sends a location request...indicat[ing] a geographical area of interest and the target subscriber.” Kraufvelin, [0055]; *see also* [0063] (“The location request...contains the identity of the target user equipment” and “a shape.”).

**107.** This request is illustrated at step 1 of Figure 4 of Kraufvelin, reproduced below:

LCS Client request *associating* mobile  
station 1 with area of interest 5

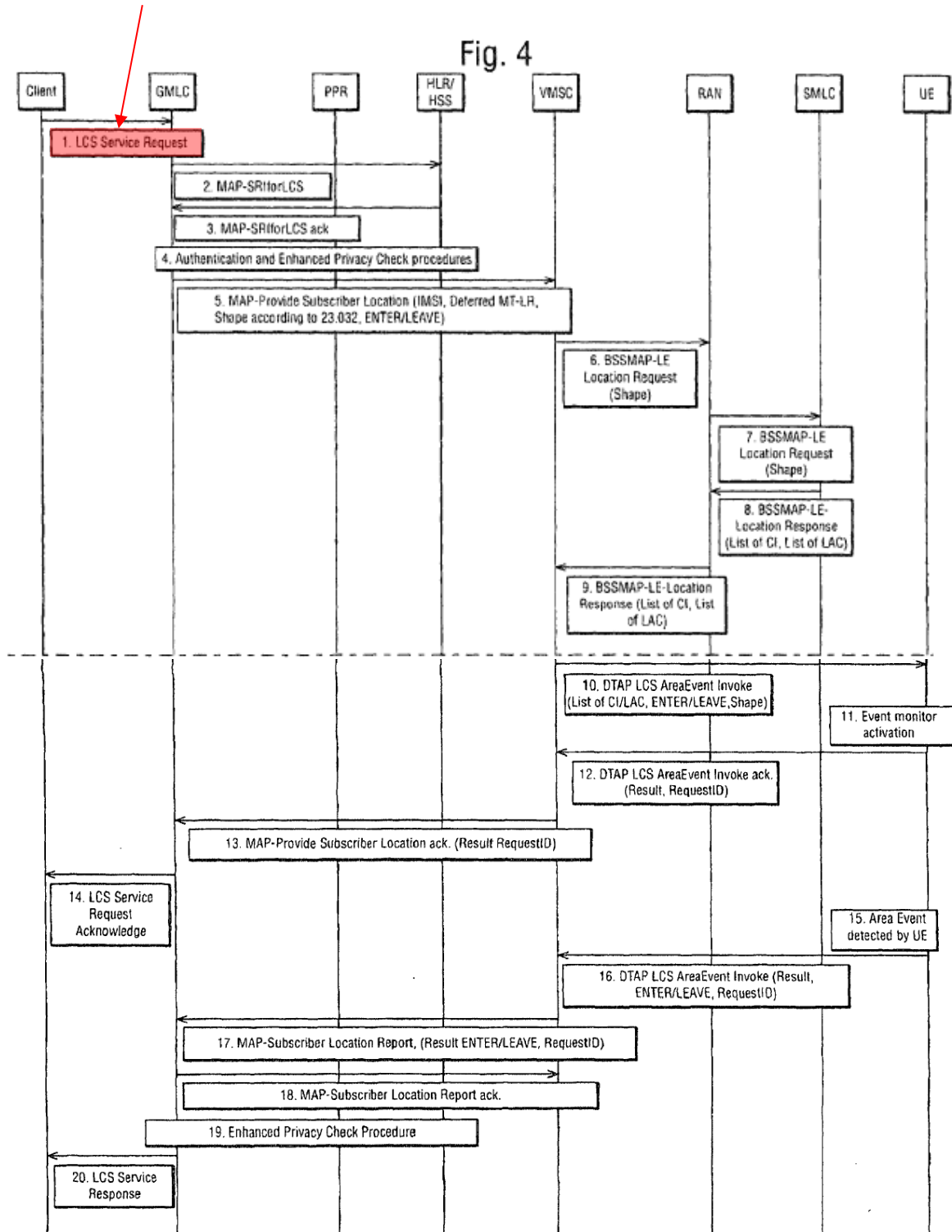


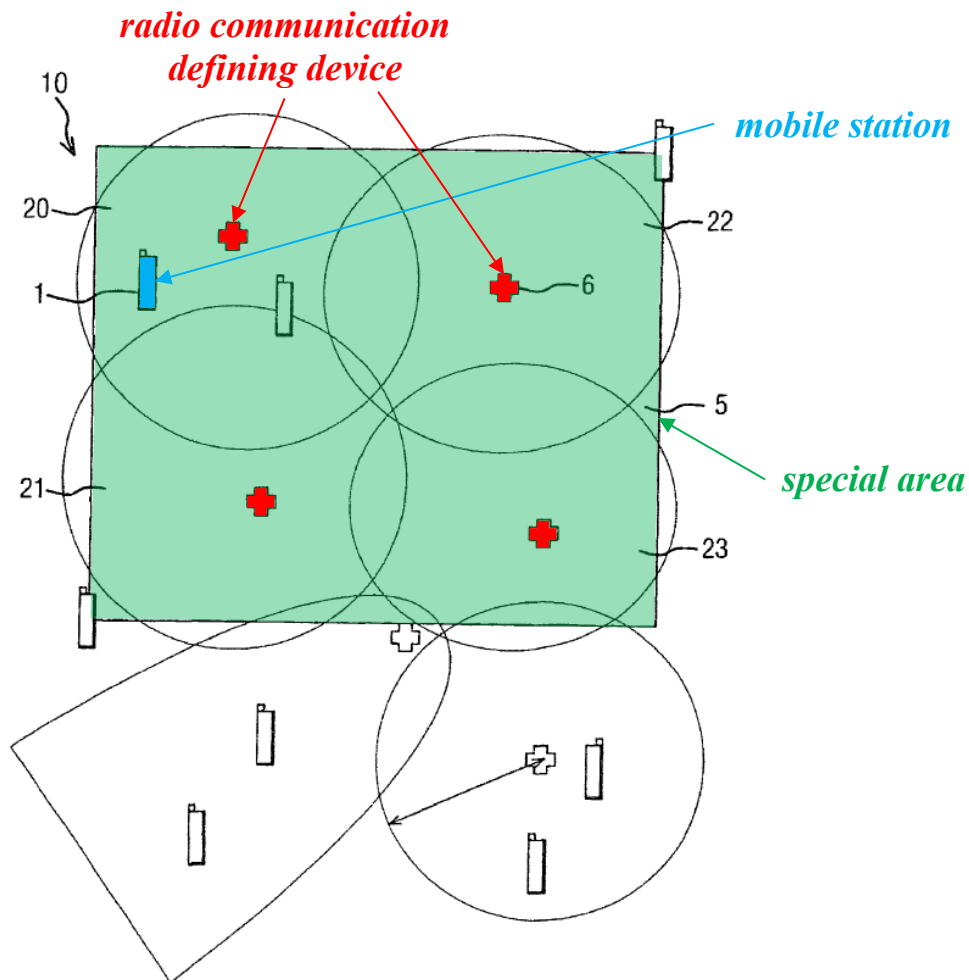
Fig. 4 (Contd.)

Kraufvelin, Fig. 4 (annotated)

**108.** Therefore, the combination renders obvious *[a] method* (Kraufvelin’s method” of providing location-based services) *for monitoring the presence of a mobile station* (“provid[ing] information regarding the presence of a mobile station”) *in one or more special areas* (“relative a geographical area of interest”) *associated with the mobile station* (“location request...indicates a geographical area of interest and the target subscriber”).

- b.** **[1.1]** *(a) repeatedly transmitting from at least one radio communication defining device a radio distinctive defining signal in at least one channel that at least partially defines one of the special areas by its coverage,*

**109.** Kraufvelin describes multiple base stations, individually referred to as “a base station 6,” or “base transceiver station (BTS)” (*radio communication defining device*). Kraufvelin, [0039], [0004]. These base stations are highlighted in red in Kraufvelin’s Figure 2, below, and they renders obvious *radio communication defining device[s]*.



**Kraufvelin, Fig. 2 (annotated)**

**110.** Consistent with conventional cellular network standards, each base station servicing a cell broadcasts a unique “cell ID.” Kraufvelin, [0009], [0056], [0060]; TS23.171 standard v.3.10.0, 32 (section 8.7.1.2); TS23.171 standard v.1.0.0, 9-10 (section 4.3), 20 (section 6.3.5); TS23.271 standard v. 6.4.0, 30 (section 6.3.4). Applicable to limitation [1.1], a broadcast cell ID is *a radio distinctive defining signal* if its respective base station is in the area of interest 5 because its cell ID is included in the list of cell IDs defining the area of interest 5. As explained by

Kraufvelin, “[t]he geographical area 5 may be translated into **a list of Cell I[D]s**. In FIG. 2 the area 5 is shown to be covered by the **cells 20 to 23**. **The IDs of these cells would thus be included in the list [of Cell IDs]**.” Kraufvelin, [0056]. This list is then “sent to the mobile station 1” so the mobile station can “check the new Cell ID against the list” to determine if it is within the area of interest 5. Kraufvelin, [0060]. Therefore, each cell ID broadcast by a base station in the list of Cell IDs is *a radio distinctive defining signal*. In the example illustrated in Figure 2, above, each cell ID of base stations within cells 20 to 23 is *a radio distinctive defining signal*, because “cells 20 to 23” define the area of interest 5.

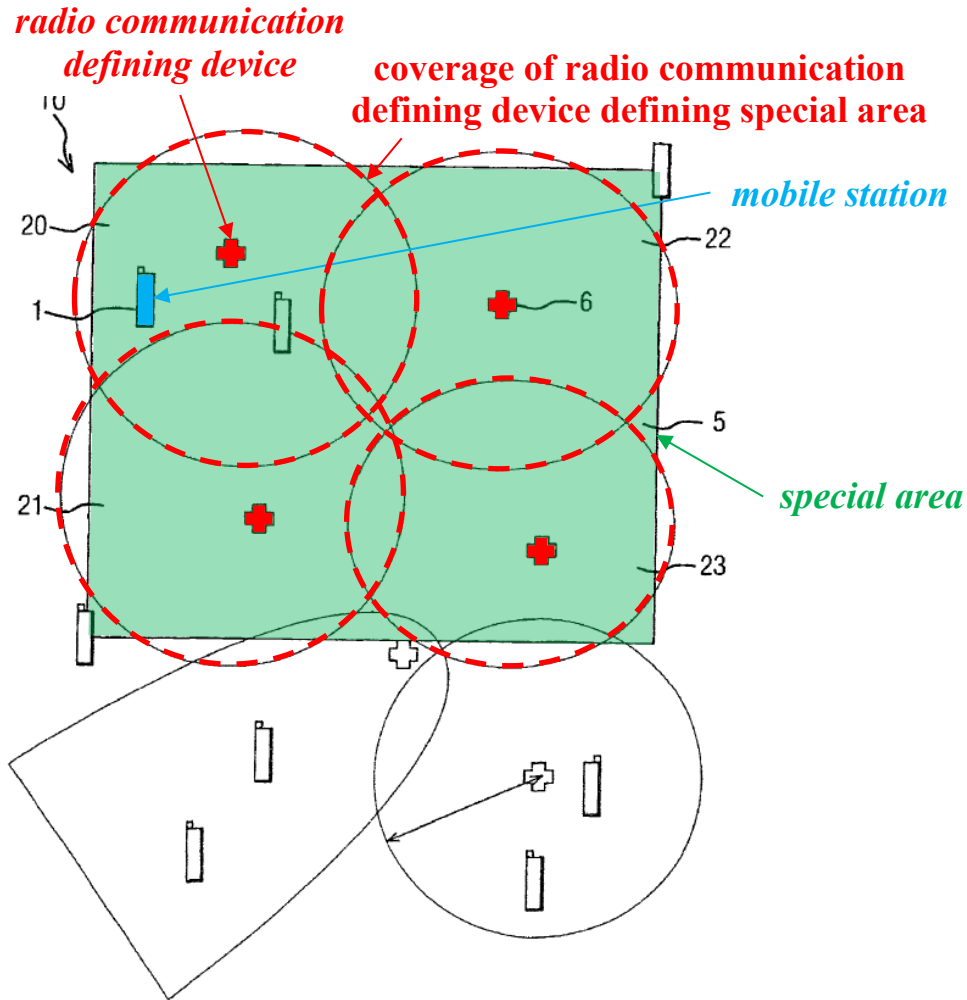
**111.** Kraufvelin also explains that “[w]hen the UE performs a cell handover,” it “check[s] the details of the new serving cell, including the cell ID.” Kraufvelin, [0079]. A POSITA would have recognized that Kraufvelin’s base stations repeatedly transmit their respective cell IDs because this was a conventional aspect of cellular networks, as evidenced by Kraufvelin. Kraufvelin explains that multiple mobile stations enter and exit the range of a base station 6, and that each receives the cell ID of the base station 6. *See* Kraufvelin, Fig. 2 (illustrating multiple mobile stations within coverage area of cells). To the extent it is argued that Kraufvelin does not explicitly teach that each base station repeatedly broadcasts its cell ID, this is also a conventional implementation detail taught by Hashimoto. Hashimoto, [0135].

**112.** Hashimoto explains what data is broadcast by cellular base stations, specifically stating that cellular base stations “inform the terminal of various parameters” including “identification information (ID) of a cell called ‘Cell-ID’” by “**periodically transmit[ting]** system information called ‘broadcast information.’” Hashimoto, [0135], Fig. 17. “[**P**]eriodically transmit[ting]” a cell ID renders obvious *repeatedly transmitting* because periodically means an action is performed multiple times, or *repeatedly*. As explained above, this repeated transmission is beneficial because multiple mobile stations enter the coverage area of the cell and the base station is not aware of when the mobile stations will enter. So the base station continuously transmits its cell ID so that new mobile stations can recognize the cell. *See* Kraufvelin, [0060]; Hashimoto, [0135]; TS23.171 standard v.1.0.0, 20 (section 6.3.5); TS23.271 standard v. 6.4.0, 30 (section 6.3.4).

**113.** Next, Hashimoto also specifically explains that a base station transmits its cell ID in the “BCCH” channel, which is *at least one channel*. Hashimoto, [0135]. This channel is used “**to inform the terminal** of various parameters (such as **the identification information (ID) of a cell** called “**Cell-ID**.” Hashimoto, [0135].

**114.** In addition, Kraufvelin’s area of interest 5, which is *a special area*, is defined by the coverage of multiple cells, as illustrated in Kraufvelin’s Figure 2. *See* Kraufvelin, Fig. 2, [0056]. The LCS Client 8 defines the area of interest 5. Kraufvelin, [0055] (“**location request...indicat[ing] a geographical area of**

**interest** and the target subscriber.”), [0063], Fig. 4 (step 1). The area of interest 5 is then mapped to a list of cell IDs. *See* Kraufvelin, [0039]-[0040], [0058]-[0059] (describing “a mapping function” that “maps the defined area to cells.”), [0056], [0070]-[0071]. The cells included within the list define the area of interest 5 by their coverage, as shown in Figure 2, below. Kraufvelin explains that “the area of interest [5] may” be “defined [by the] **radius or distance from a certain point (e.g. base station location...)**.” Kraufvelin, [0053]. Similarly, “the area may be defined by means of any appropriate scheme, such as by means of **one or more cells.**” Kraufvelin, [0062].



**Kraufvelin, Fig. 2 (annotated)**

**115.** In the example shown in FIG. 2 above, the coverage area of cells 20 to 23 define the area of interest 5. Kraufvelin, [0056]. “The IDs of these cells would thus be included in the list.” Kraufvelin, [0056].

**116.** Thus, the combination of Kraufvelin, Hashimoto, and Andersson renders obvious *repeatedly transmitting* (“periodically transmit[ing]”) *from at least one radio communication defining device* (from a “base station 6”) *a radio distinctive defining signal* (“cell-ID” of base station within area of interest 5) *in at*

*least one channel (“BCCH” channel) that at least partially defines one of the special areas by its coverage* (defining the area of interest 5 by the coverage of multiple base stations 6).

- c. [1.2] *(b) observing the channel and processing any received signal by the mobile station in order to determine whether or not it is receiving a defining signal,*

117. Kraufvelin explains that “[w]hen the UE performs a cell handover the **monitoring entity (ME) shall check the details of the new serving cell, including the cell ID**, step 15 [of Fig. 4].” Kraufvelin, [0079]. This disclosure renders obvious this limitation. In addition, the process of a UE observing the base station signal and determining the cell ID (*defining signal*) was well known. Hashimoto explains that the signal with details of the new serving cell, including Cell ID, is periodically transmitted in the BCCH channel. Hashimoto, [0135]. As explained below, this disclosure also renders obvious *observing the channel*. Kraufvelin, [0079].

118. In Kraufvelin, when the mobile station receives the list of Cell IDs, it sends an acknowledgment indicating that it is “waiting for a trigger event.” Kraufvelin, [0076]. At claim 1 of Kraufvelin, this process of initiating the monitoring or observing step is described as “activating monitoring for an event indicative of a change in the presence status of the mobile station relative to said area of interest.” Kraufvelin, claim 1. Claim 2 further explains that this “monitoring is activated at the mobile station.” Kraufvelin, claim 2.

**119.** The activation of this monitoring step is illustrated below at step 11. This monitoring step is activated after the mobile station receives the list of cell IDs corresponding to the area of interest, illustrated at step 10. The mobile station then sends an acknowledgment that it has received the list of cell IDs and has started monitoring for entrance into the area of interest at step 12 below.

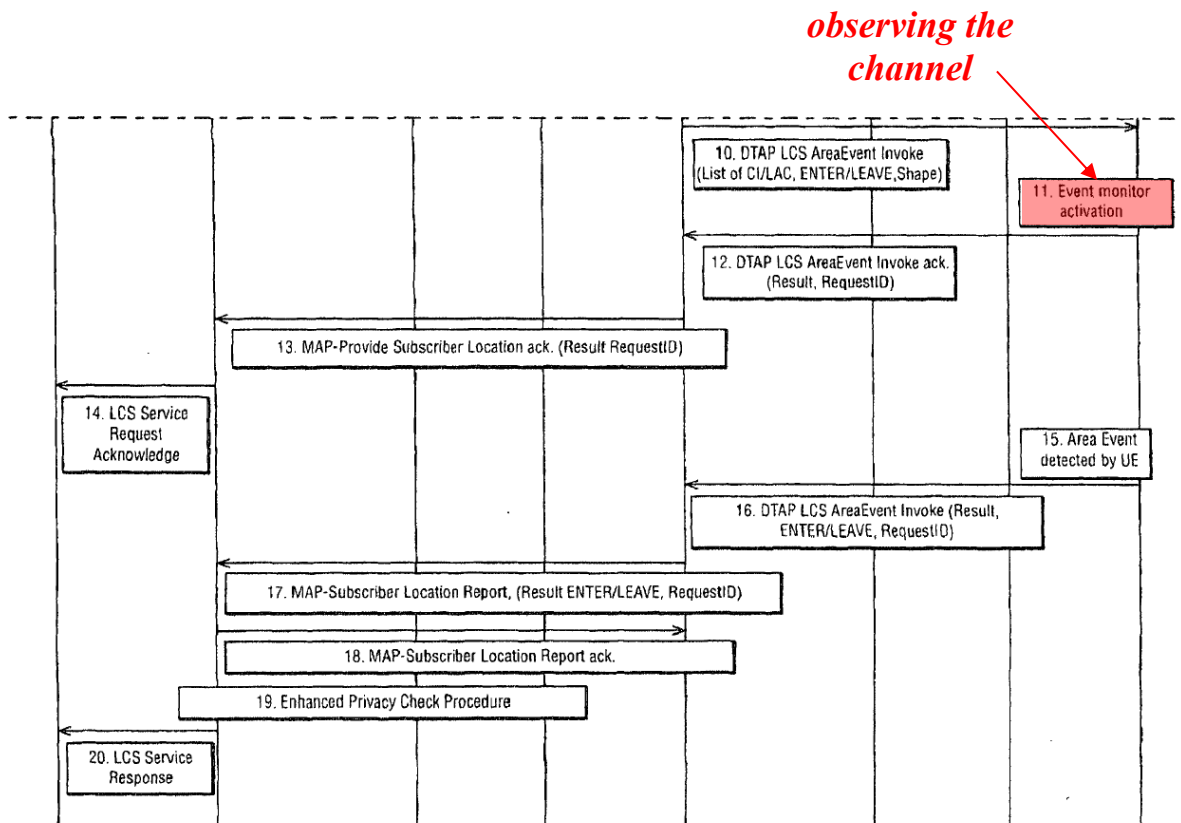


Fig. 4 (Contd.)

**Kraufvelin, Fig. 4 (annotated)**

**120.** In the combination, Kraufvelin's mobile station receives broadcast information via the BCCH channel. Hashimoto, [0135]; limitation [1.1].

**121.** In addition, it was well known, as shown by Kraufvelin, that mobile stations receive multiple signals. For example, mobile stations receive “SMS” signals. Kraufvelin, [0013], [0012]. Mobile stations also receive “non-packet data” such as “voice communications and so on.” Kraufvelin, [0119]. As explained at limitation [1.1], in the combination, cell identification information is received by the mobile station via the BCCH channel. Hashimoto, [0135]. Receiving and identifying a signal as being sent over the BCCH channel (and specifically the SCH channel within the BCCH channel) renders obvious *processing any received signal by the mobile station in order to determine whether or not it is receiving a defining signal*. The mobile station would recognize a cell ID received in the SCH channel within the BCCH channel contrasted with the other signals the mobile station receives, such as SMS data or voice communications data over other channels. The difference in the type of signal, timing of reception of the signal, as well as the channel in which it was received (i.e., the SCH channel within the BCCH channel) would be used by the mobile station to determine that it is receiving a cell ID of a new cell (*a defining signal*). Hashimoto, [0135]; Ramesh, [0007] (“**The SCH allows identification of the cell.**”); Ostberg, [0009] (“Primary Synchronization CHannel (P-SCH)” is “**used by the mobile terminal to find and detect a cell.**”). It was also known that the SCH channel is part of the BCCH channel. *See, e.g.*, Madsen, [0036] (“controlling information” is “sent in the part of the BCCH known as the Synchronization Channel

SCH”); Delaveau, [0206] (describing “the synchronization signal SCH included in the BCCH channel”).

122. Thus, Kraufvelin and Hashimoto render obvious *observing the channel* (UE “monitoring entity (ME)” monitoring the BCCH channel) *and processing any received signal by the mobile station in order to determine whether or not it is receiving a defining signal* (determining that data received in the SCH channel of the BCCH channel includes a cell ID).

- d. [1.3] *(c) processing any received defining signal by the mobile station and the mobile station determines whether or not the defining signal received is a distinctive defining signal that at least partially defines one of the special areas, and determines whether or not the mobile station is present in one or more of the special areas,*

123. In Kraufvelin, “[w]hen the UE performs a cell handover the monitoring entity (ME) shall **check the details of the new serving cell, including the cell ID**” and “**compare the current cell ID or similar against one or more, target cell IDs in the list received from the network.**” Kraufvelin, [0079]. Kraufvelin also explains that “[w]hen the Cell ID is updated as the subscriber is moving the mobile station 1 will check the new Cell ID against the list.” Kraufvelin, [0060].

124. The mobile station *determines whether or not the defining signal* (cell ID) it has received is a *distinctive defining signal* because the mobile station determines whether the received cell ID is one of the cell IDs corresponding to the area of interest 5 in the stored list. Kraufvelin, [0079]-[0080].

**125.** In Kraufvelin, the concept of comparing the received cell ID to the stored list of cell IDs renders obvious *processing any received defining signal by the mobile station*. As explained at limitation [1.1], the cell IDs of the base stations 6 within an area of interest 5 in Kraufvelin render obvious *a radio distinctive defining signal that at least partially defines one of the special areas by its coverage* because each cell ID of base stations within cells 20 to 23 define the area of interest 5. Kraufvelin, [0056]-[0060]. Therefore, when the mobile station identifies a match between a received cell ID and the stored list, this step also renders obvious *the mobile station determines whether or not the defining signal received is a distinctive defining signal that at least partially defines one of the special areas* because if the received cell ID (*defining signal*) is within the list of stored cell IDs, the mobile station determines that it is one of the cell IDs defining the area of interest 5 (*distinctive defining signal*). See Kraufvelin, [0056]-[0060].

**126.** Based on determining that there is a match between the cell ID received and a cell ID in the stored list, the mobile station then also determines whether it has entered the area of interest 5. Specifically, the mobile station generates a report including: “a) An area event LCS report **indicating a positive match** with the target cells, i.e. **the subscriber is ENTERing the area.**” Kraufvelin, [0080]. “An area event occurs when the specified user equipment leaves or enters a predetermined geographical area.” Kraufvelin, [0061]. In this way, the mobile station *determines*

*whether or not the mobile station is present in one or more of the special areas.*

Kraufvelin, [0079]-[0080].

**127.** Kraufvelin also explains that the determination performed by the mobile station may also be made based on comparing a GPS location with a shape of the area of interest 5. Kraufvelin, [0114]. For example, rather than, or in addition to, determining that the mobile station has entered the area of interest 5 by comparing a received cell ID against the list, the mobile station may compare its known GPS location to the shape it received. For example, Kraufvelin explains that “[i]f the UE supports some more accurate positioning technology the shape used in the request may be conveyed along with the Cells, Routing Area and Location Areas to the UE.” Kraufvelin, [0095]. Then, “[t]he calculated position” of the mobile station can be “compared to the submitted shape” to verify that the mobile station is in the area of interest 5. Kraufvelin, [0095]. This process is another determining step performed by Kraufvelin’s mobile station.

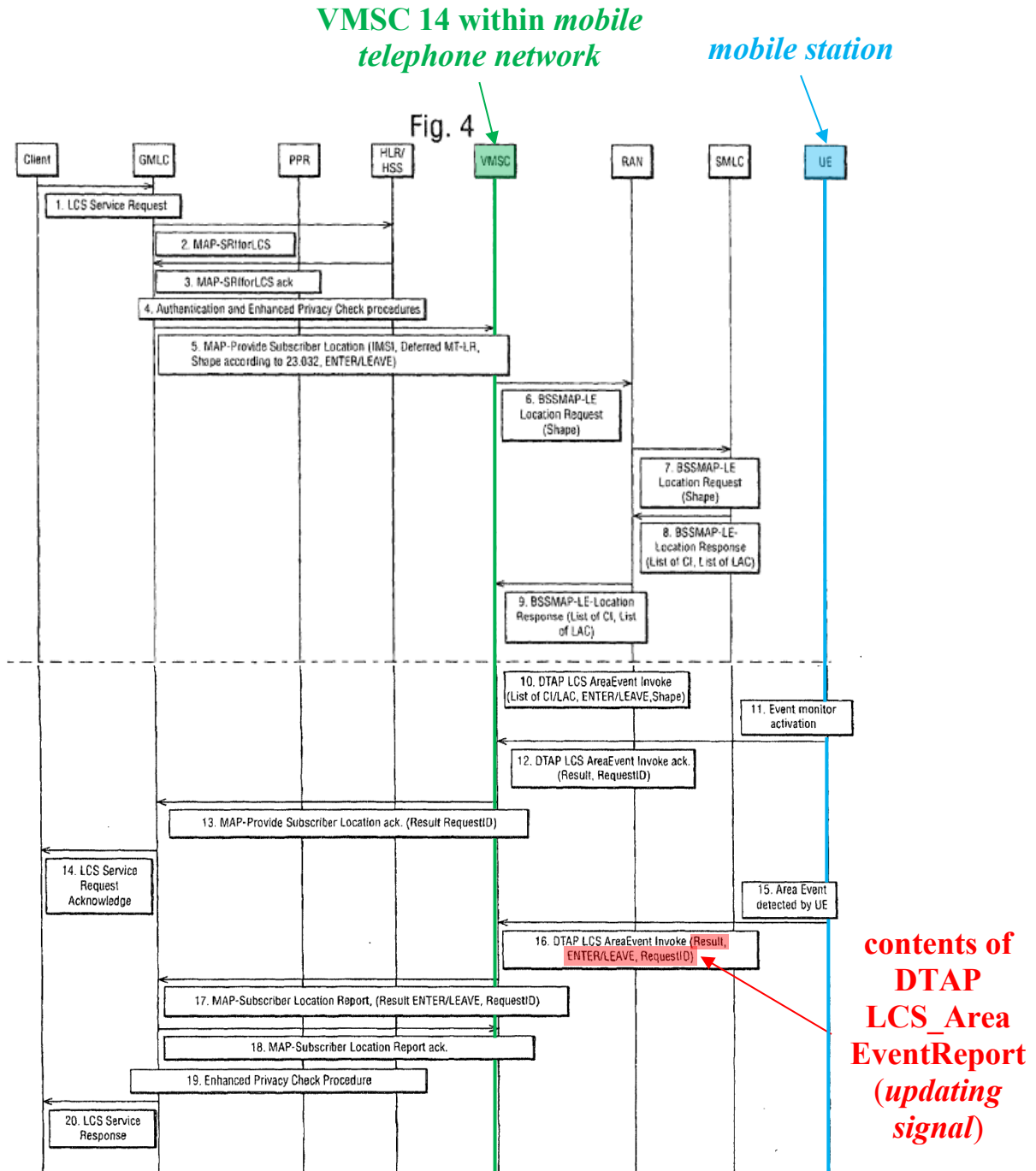
**128.** Thus, the combination renders obvious *processing any received defining signal by the mobile station (comparing a received cell ID against the list of cell IDs of the area of interest 5) and the mobile station determines whether or not the defining signal received is a distinctive defining signal (determining that the new cell ID matches a cell ID within the list) that at least partially defines one of the special areas (each cell ID of cells 20-23 partially define the area of interest 5), and*

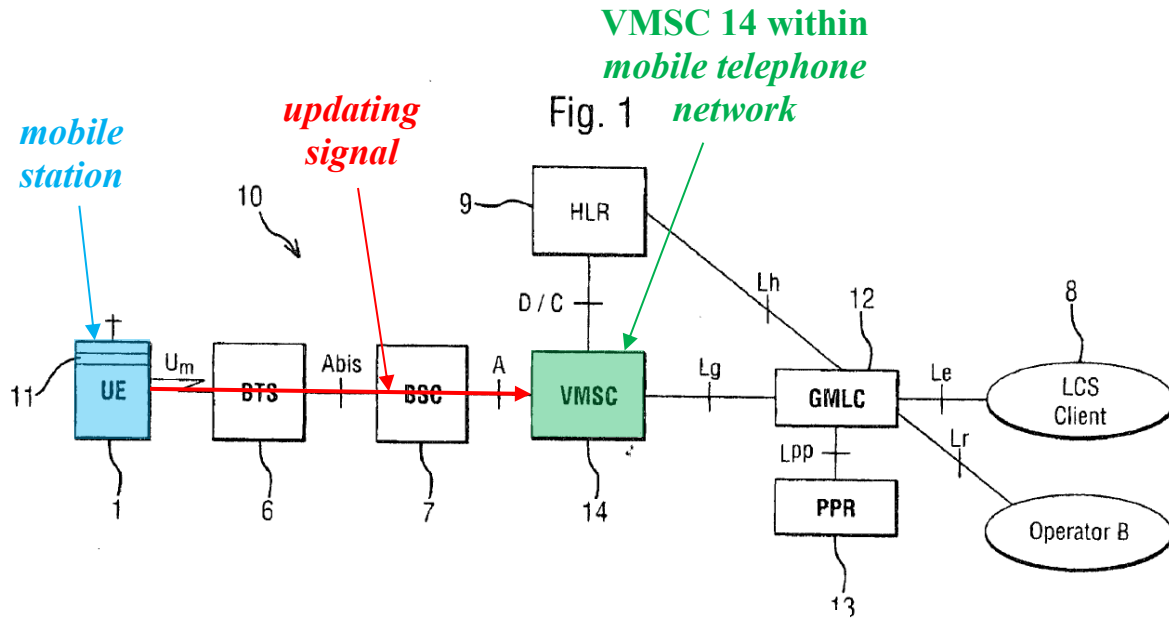
*determines whether or not the mobile station is present in one or more of the special areas* (determining whether mobile station 1 entered or exited area of interest 5 based on cell ID comparison and/or based on GPS comparison of current position with shape of area of interest 5).

- e. [1.4] *(d) sending an updating signal from the mobile station to a mobile telephone network about the mobile station presence in one or more of the special areas,*

129. In the combination, Kraufvelin describes *sending an updating signal from the mobile station to a mobile telephone network*. In Kraufvelin, if the mobile station determines that it has entered a cell of the area of interest 5, it sends “a DTAP LCS-AreaEventReport...to the MSC/SGSN, see step 16” which includes the result of whether the mobile station has entered or exited the area of interest 5. Kraufvelin, [0082]. The DTAP LCS-AreaEventReport “may include the original LDR reference, the GMLC address, the time that the event occurred and the current serving cell ID. Information relating to the area event or UE status may optionally be included in this report.” Kraufvelin, [0082]. In Figure 4, below, the DTAP LCS-AreaEventReport includes the “Result, ENTER/LEAVE,” indicating whether the mobile station entered or left the area of interest 5, and the “Request ID.” Kraufvelin, [0080], Fig. 4. Any or all of the contents of the DTAP LCS-AreaEventReport render obvious *an updating signal*. This report is sent from the mobile station to the VMSC 14, which

is part of the *mobile telephone network*. The transmission of the report is also illustrated in the context of Figure 1, below.





Kraufvelin, Fig. 1 (annotated)

**130.** In Kraufvelin, the contents of the DTAP LCS\_AreaEventReport, which correspond to the *updating signal* claimed, includes information *about the mobile station presence in one or more of the special areas*. Kraufvelin, [0082]. The “time that the event occurred” and “current serving cell ID” in Kraufvelin indicates whether the mobile station has entered or exited the area of interest 5 because the cell ID corresponds to one of the cell IDs of the area of interest 5 as well as the time the mobile station entered or exited. Kraufvelin, [0082]. This information coupled with the “Result ENTER/LEAVE” indicates whether the mobile station entered or left the area of interest 5. Kraufvelin, [0080].

**131.** Thus, in the combination, Kraufvelin renders obvious *sending an updating signal* (contents of “LCS-AreaEventReport”) *from the mobile station*

(“mobile station 1”) to a mobile telephone network (VMSC 14 and GMLC 12) about the mobile station presence in one or more of the special areas (contents of LCS report include current cell ID, time mobile station entered, etc.).

- f. [1.5] *where the updating signal sending is uncorrelated to any mobile station phone call establishment and is based on the last determination performed by the mobile station about its presence in each of the special areas,*

132. In the combination, Kraufvelin renders obvious that *the updating signal sending is uncorrelated to any mobile station phone call establishment*. As described at limitation [1.6], below, the LCS report in Kraufvelin may be sent at different times. For example, the LCS report may be sent “every 10-15 minutes,” when the mobile station enters or leaves the area of interest, or “after it has been camping on” a cell that at least partially defines the area of interest. Kraufvelin, [0080], [0101]. These times are not correlated to the establishment of a phone call. Therefore, the sending of the LCS report, which includes *the updating signal*, is not based on the mobile station making a call, i.e., *uncorrelated to any mobile station phone call establishment*. See Kraufvelin, [0080], [0101]. Further, Kraufvelin explicitly states that the process may be performed when the mobile station is idle. Kraufvelin says that “[a] mobile terminal changes cells quite often **in idle mode**” and that when the mobile station changes cells, it will perform a location update. Kraufvelin, [0097], [0079] (“When the UE performs a cell handover the monitoring entity (ME) shall

check the details of the new serving cell...”). Kraufvelin also states that this process is performed “**independent from the network operators.**” Kraufvelin, [0093].

**133.** Kraufvelin also explains that the contents of the LCS report (*the updating signal*) is based on the last determination performed by the mobile station about its presence in each of the special areas. The LCS report is sent after the mobile station determines that it has entered or exited the area of interest 5, Kraufvelin, [0080], and relates to the just entered cell, such as the “the current serving cell ID,” the “time that the event occurred,” and “Result ENTER/LEAVE,” Kraufvelin, [0082]. As shown in Fig. 4, the updating signal is sent (step 16) immediately after the mobile station determines that it has entered the area of interest (step 15).

**134.** Thus, in the combination, Kraufvelin renders obvious *where the updating signal sending is uncorrelated to any mobile station phone call establishment* (sending the LCS report even when the mobile station is in an idle mode) *and is based on the last determination performed by the mobile station about its presence in each of the special areas* (LCS report indicating the cell ID of the new cell and time of entrance).

- g. [1.6] *and said updating signal being sent at least one of (i) periodically, (ii) when the mobile station enters into or exits from one of the special areas, and (iii) when the mobile station remains into a special area,*

135. Kraufvelin describes sending the updating signal *periodically*.

Kraufvelin explains that if the mobile station is stationary for an extended period of time, “[i]n the 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.**” Kraufvelin, [0101]. Thus, regardless of whether the mobile station has entered or exited the area of interest, for example if the mobile station has remained in the same cell for a long period of time, the mobile station may be configured to send an updating signal (i.e., the contents of DTAP LCS AreaEventInvoke report) at regular intervals of time which renders obvious *periodically*.

136. Kraufvelin also renders obvious sending the updating signal *when the mobile station enters into or exits from one of the special areas*. Kraufvelin’s mobile station may also send the report when it enters or exits the area of interest 5, 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.**” Kraufvelin, [0080].

137. Kraufvelin also renders obvious sending the updating signal *when the mobile station remains into a special area*. Kraufvelin explains that the mobile

station may generate and send the report not immediately after entering a cell of the area of interest, but “**after it has been camping on, or using, the relevant cell for a predetermined time period, e.g. 2 minutes.**” Kraufvelin, [0101]. Kraufvelin describes each of these timing options as “[p]ossible rules” that may be “applied in combination or separately” and may be “defined by the LCS client.” Kraufvelin, [0100], [0102].

**138.** These timing configurations are used when “the mobile changes cells quite frequently” and “may be advantageously used to prevent the mobile or SIM card from reporting area changes too frequently.” Kraufvelin, [0099].

- h. [1.7] *(e) routing the updating signal from the mobile telephone network to special operating means that adapt the value of at least one operating parameter taking into account the presence of the mobile station in each of the special areas,***

**139.** As shown in Fig. 4 below, after the VMSC 14, which is part of the *mobile telephone network* as described at limitation [1.4], receives the contents of the LCS\_AreaEventReport (the *updating signal*), it compiles it into the “MAP-SUBSCRIBER-LOCATION-REPORT,” and sends it to the GMLC 12. Kraufvelin, [0083]. Kraufvelin’s GMLC 12, HLR 9 and/or LCS Client 8, in view of Andersson’s database techniques, renders obvious *special operating means*. As shown below, the LCS\_AreaEventReport (“LCS report”) contents are included in the MAP-

SUBSCRIBER-LOCATION-REPORT (“MAP report”) and forwarded to the  
GMLC 12:

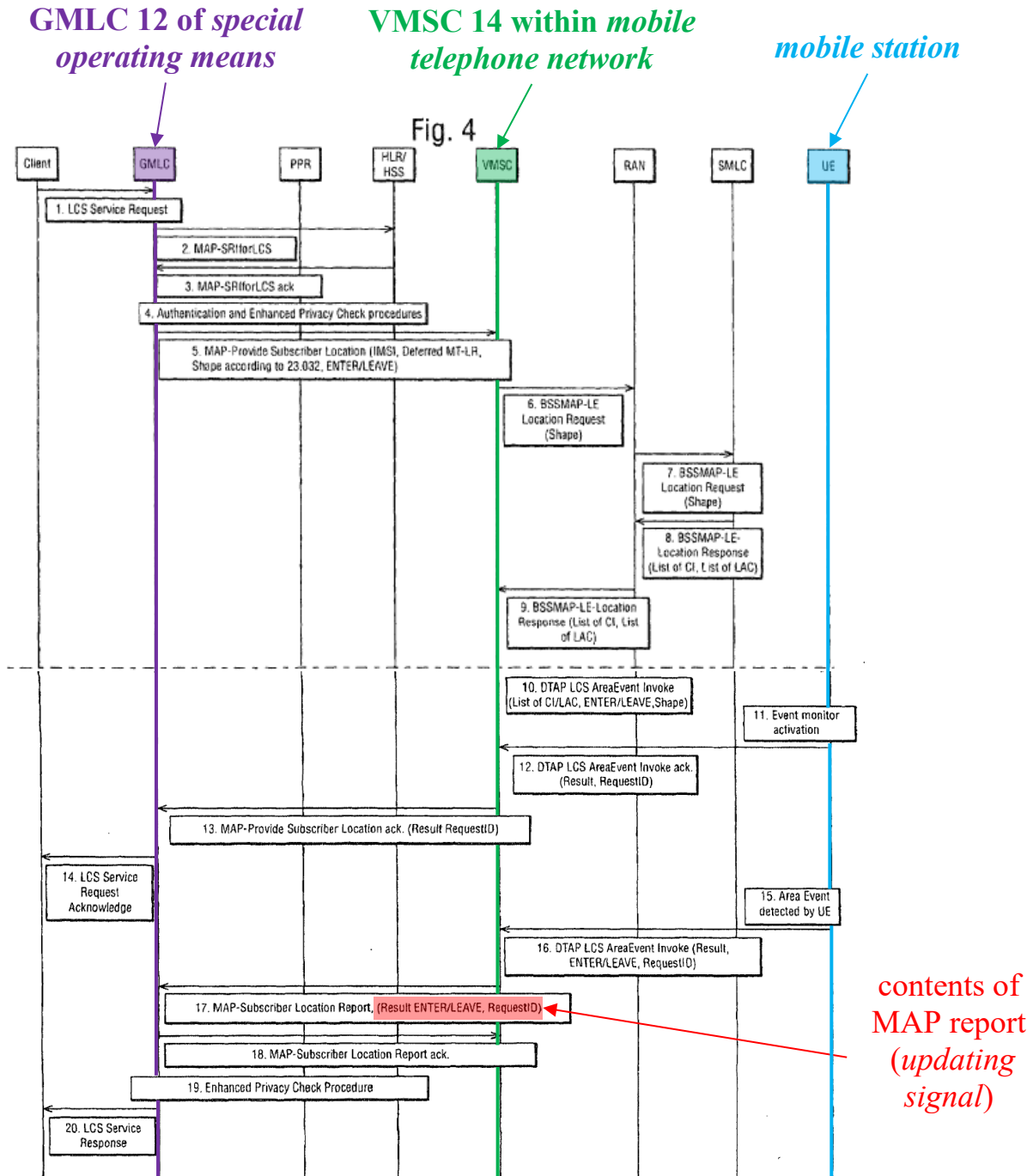


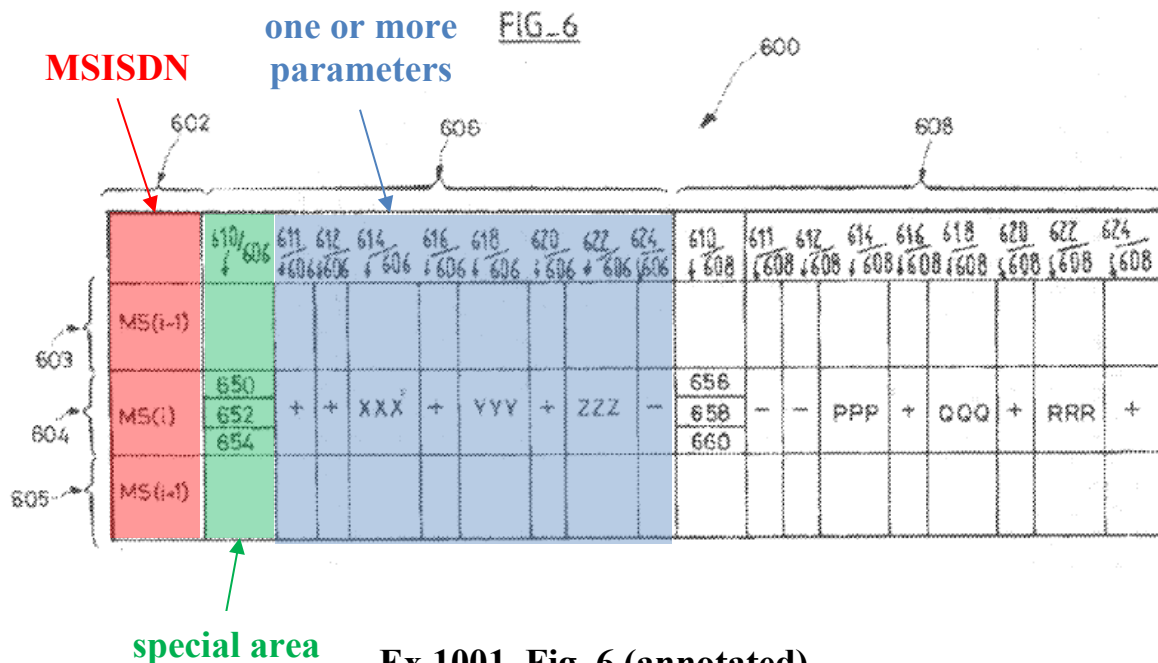
Fig. 4 (Contd.)  
Kraufvelin, Fig. 4 (annotated)

**140.** The combination of Kraufvelin, Hashimoto, and Andersson also describes the corresponding structure of *special operating means*. As explained above, the structure of *special operating means* disclosed in the '040 patent specification includes at least one server storing a database linking a special area, a mobile station, and one or more parameters, where the one or more parameters are adapted depending on information received from the mobile station. *See* section VII.A.; Ex.1001, 5:8-15, Fig. 6; section IX.F.1.e (limitation [1.4]). As explained below, Kraufvelin and Anderson describe the mobile station sending location information to the network. Kraufvelin, [0080], [0082]-[0083]; Andersson, 6:1-7. Further, Andersson describes updating one or more parameters depending on information received from the mobile station. Andersson, 6:1-24, 5:41-45, 8:45-56.

**141.** Kraufvelin describes multiple servers, including the GMLC 12, HLR 9, and LCS Client 8. Kraufvelin, Fig. 1, [0104]. The GMLC 12, HLR 9, and LCS Client 8, together or separately, describes at least one server storing information related to the presence of the mobile station.

**142.** In the combination, Andersson teaches a database storing the same data as the '040 patent's database. In particular, Figure 6 of the '040 patent shows a database linking the mobile station (MSISDN number (column 602 in red), Ex.1001, 17:62-63) to the special areas (base station or wireless device ID codes (column

610/606 in green), Ex.1001, 18:1-15) and one or more parameters (columns 611/606-624/606 in blue, Ex.1001, 18:28-19:4).



Ex.1001, Fig. 6 (annotated)

143. Andersson's database includes these same data elements, including an MSISDN identifying the mobile station (in red), a list of allowed cells of a special area (in green), and one or more parameters (authorized services flags and/or restriction control flags, in blue).

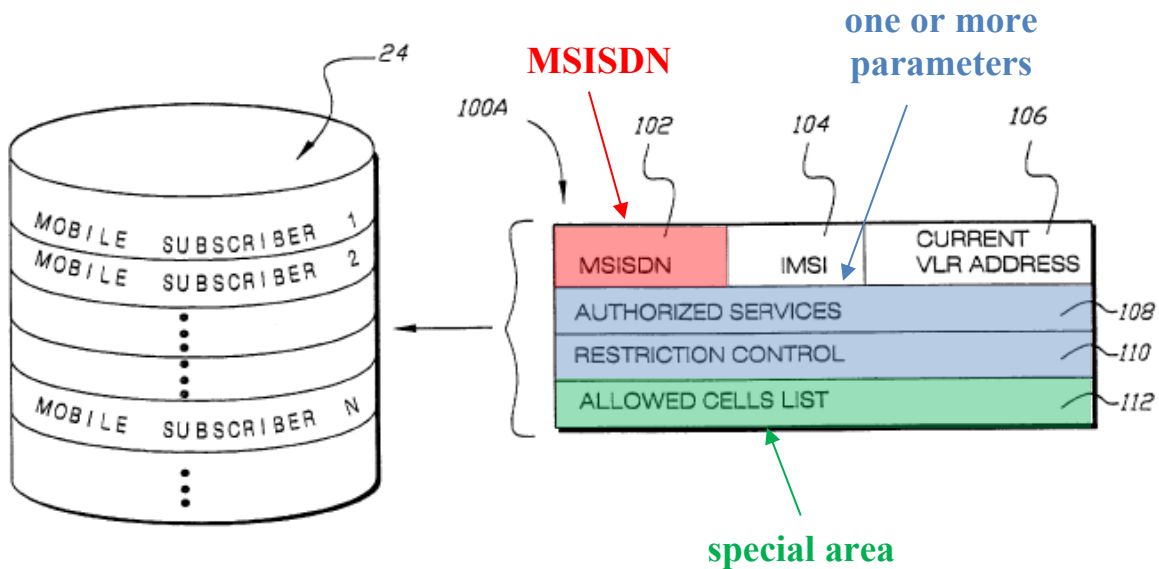


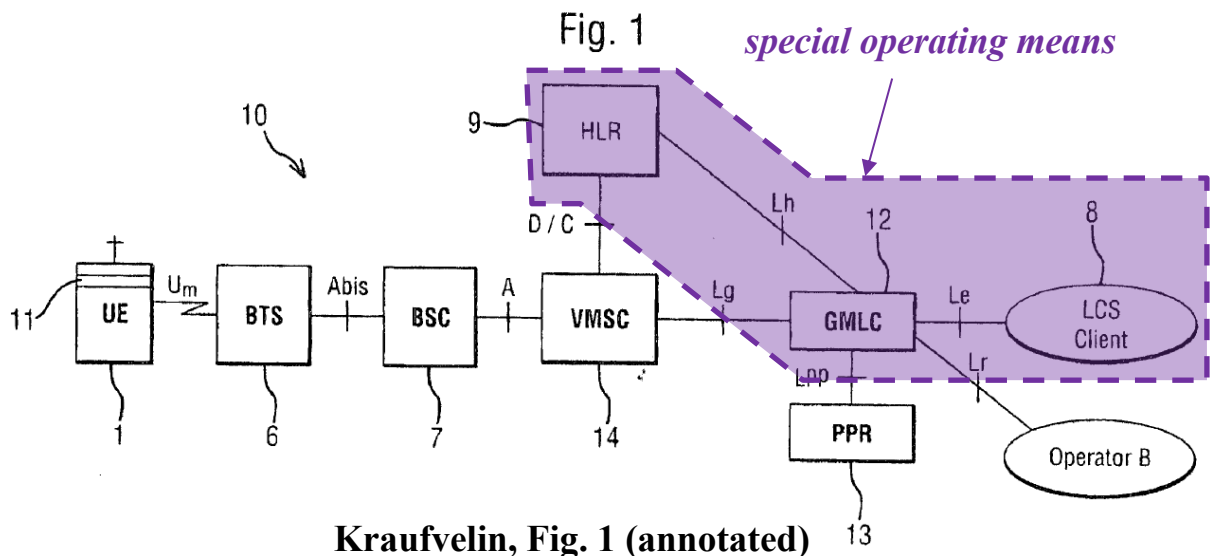
*Fig. 2A*

**Andersson, Fig. 2A (annotated)**

144. In the combination, Kraufvelin's HLR 9 stores a database of the type taught by Andersson, separately or in conjunction with the GMLC 12 and/or LCS Client 8. As just explained in more detail below regarding the function of the *special operating means*, the one or more parameters are adapted. See Andersson, 8:35-52 (applying different "tariff rates, as indicated by fields 120D, 122D, and 124D" with a "flag in restriction control field 110D"), 5:41-45 (parameters "must be updated as the mobile station MS moves"). In addition, the parameters are adapted depending on information received from the mobile station. See Andersson, 6:1-24 (updating "the current VLR address field 106" and other parameters including "information contained in restriction control field 110 and allowed cells list field 112"), 5:41-45, 8:45-56. Andersson teaches that these parameters are adapted based on the location

of the mobile station. *See* Andersson, 5:41-45 (“updated as the mobile station MS moves”). In the combination, the location of the mobile station is included in the updating signal sent from the mobile station to the network. *See* limitation [1.6].

**145.** Accordingly, in the combination, Kraufvelin’s GMLC 12, HLR 9, and/or LCS Client 8, separately or in combination, describe storing a database linking the mobile station, the special area, and one or more operating parameters, as taught by Andersson, which renders obvious the structure of *special operating means*.



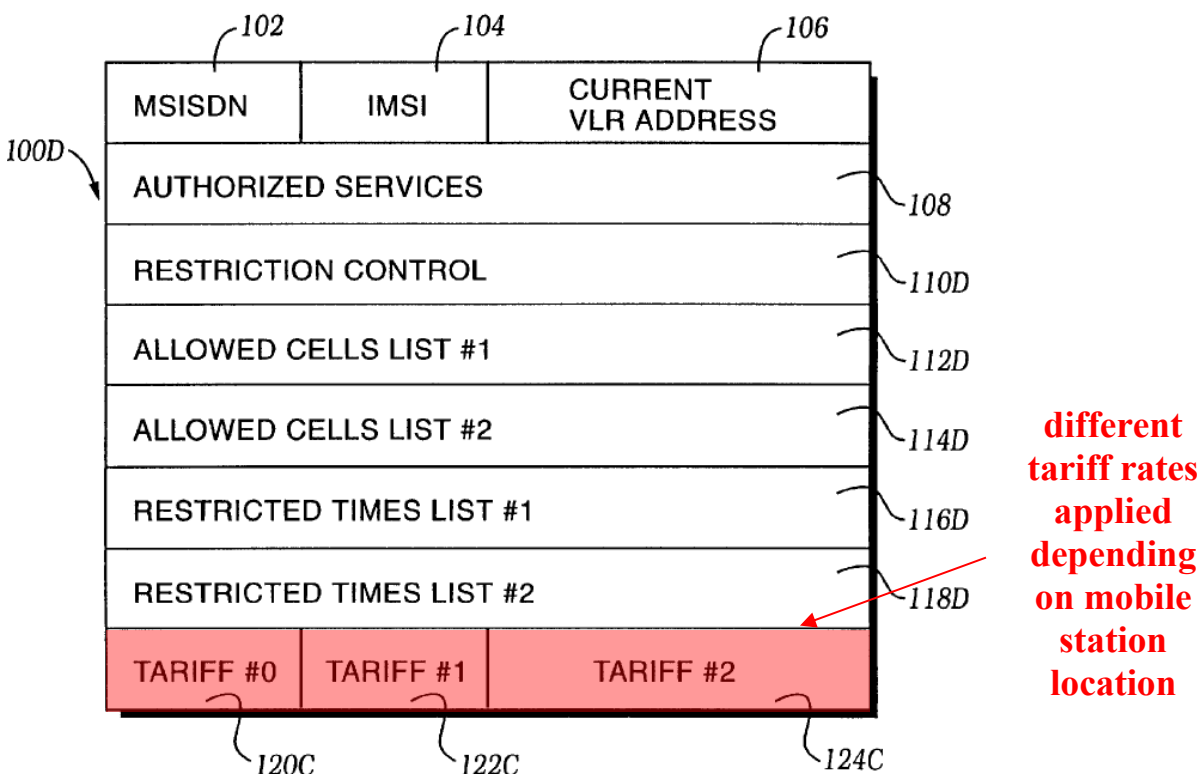
**146.** In addition, the GMLC 12, HLR 9, and LCS Client 8 (*special operating means*) of Kraufvelin perform the function of the *special operating means* described by the '040 patent (§VII.A.) and claimed in limitation [1.7], explained below.

147. Kraufvelin's GMLC 12 receives the contents of the MAP report (*updating signal*) from the VMSC 14 (*mobile telephone network*) and may perform various actions, such as a "privacy check[]." Kraufvelin, [0052], Fig. 4 (step 19). Kraufvelin explains that an action performed based on receiving the updating signal may be providing "[d]ifferent kinds of services," such as "various commercial and non-commercial services and similar applications." Kraufvelin, [0012].

148. Andersson also provides additional details regarding how location-based services are provided, including how parameters are stored and *adapted* based on the mobile station location. Andersson, Figs. 2B-2D (illustrating parameters adapted based on mobile station location). The '040 patent describes offering "different rates" based on "the instantaneous location of a mobile station." Ex.1001, 1:30-39. Andersson describes the same concept. Andersson provides services at "**a first (e.g., reduced) tariff**" for "calls originated and received in cells listed in a geographical restriction field" while "calls to or from other cells" are given "**a second (e.g., standard) tariff**." Andersson, 2:40-45, 8:35-67. To provide variable location-based tariffs, Andersson's system adapts various parameters related to the mobile station in its database as the mobile station moves throughout the network. Specifically, Andersson's system updates and applies (*adapts*) a current tariff (*operating parameter*) to calls originated and received by the mobile station based on the mobile station's location. Andersson, 8:45-67, Figs. 2A, 2D.

149. Referring to FIG. 2D, Andersson illustrates “contents of a record for a...mobile subscriber.” Andersson, 3:33-35. FIG. 2D illustrates different “tariff rates, as indicated by fields 120D, 122D, and 124D.” Andersson, 8:35-38.

*Fig. 2D*



**Andersson, FIG. 2D (annotated)**

150. As the mobile station moves into a new cell, “a location update operation must occur” and the contents of the mobile subscriber record are updated. Andersson, 1:37-44. Specifically, the system ensures that the HLR and/or VLR storing the contents of the subscriber record “have **appropriate current**

**information** about the mobile station.” Andersson, 1:37-44. To do so, the contents of the mobile subscriber record “**must be updated as mobile station MS moves.**” Andersson, 5:41-45.

**151.** To apply different tariffs as the mobile station moves, Andersson explains that a “flag in restriction control field 110D indicates that the mobile subscriber is...entitled to **lower tariffs when calls are originated or received in the cells specified in one or more of the allowed cells lists** (e.g., fields 112D and/or 114D).” Andersson, 8:48-52. In FIG. 2D, “record 100D shows tariff fields 120D, 122D, and 124D wherein are stored tariff #0, tariff #1, and tariff #2, respectively.” Andersson, 8:58-60. These three rates (“tariff #0”, “tariff #1”, “tariff #2”) are selectively applied if a call occurs while the mobile station is in a geographic area associated with that tariff rate. This disclosure in Andersson shows that the currently applied tariff is a parameter that is adapted when the mobile station moves into or out of the area of interest. Specifically, in the combination, after the mobile station enters the area of interest 5 in Kraufvelin, the system adapts the value of the currently applied tariff to the tariff associated with the area of interest, as taught by Andersson. When the mobile station exits the area of interest 5, the system adapts the value of the currently applied tariff to the tariff associated with the area outside the area of interest 5, such as the “standard tariff rate[]” or “nominal tariff.” Andersson, 8:45-67. This disclosure taught by the combination of Kraufvelin and Andersson of

adapting the current tariff based on the location of the mobile station within the area of interest 5 renders obvious *adapt[ing] the value of at least one operating parameter taking into account the presence of the mobile station in each of the special areas*. Andersson, 8:61-67, 5:49-60, Kraufvelin, Fig. 2 (illustrating area of interest 5).

**152.** In more detail, Andersson explains that as a mobile station enters an area of interest, “**a first (e.g., reduced) tariff is applied** to calls originated and received in cells listed in a geographical restriction field of the subscriber’s record in the home location register.” Andersson, 2:40-45. Outside of the area, “calls to and from other cells” are “permitted at **a second (e.g., standard) tariff.**” Andersson, 2:40-45. Thus, Andersson describes adapting the currently applied tariff between the “first (e.g., reduced) tariff” in the area of interest and the “second (e.g., standard) tariff” outside the area of interest. Andersson, 2:40-45. To determine the value of this currently applied tariff, its system uses “the information for geographically restricting operation...for determining in what cells the mobile station can be paged and from what cells the mobile station can originate calls at a first tariff rate” and “a second tariff rate.” Andersson, 13:63-14:2.

**153.** Andersson thus describes updating (*adapting*) a currently applied tariff rate (*the value of at least one operating parameter*) to calls originated or received by a mobile station based on whether the mobile station is present in particular

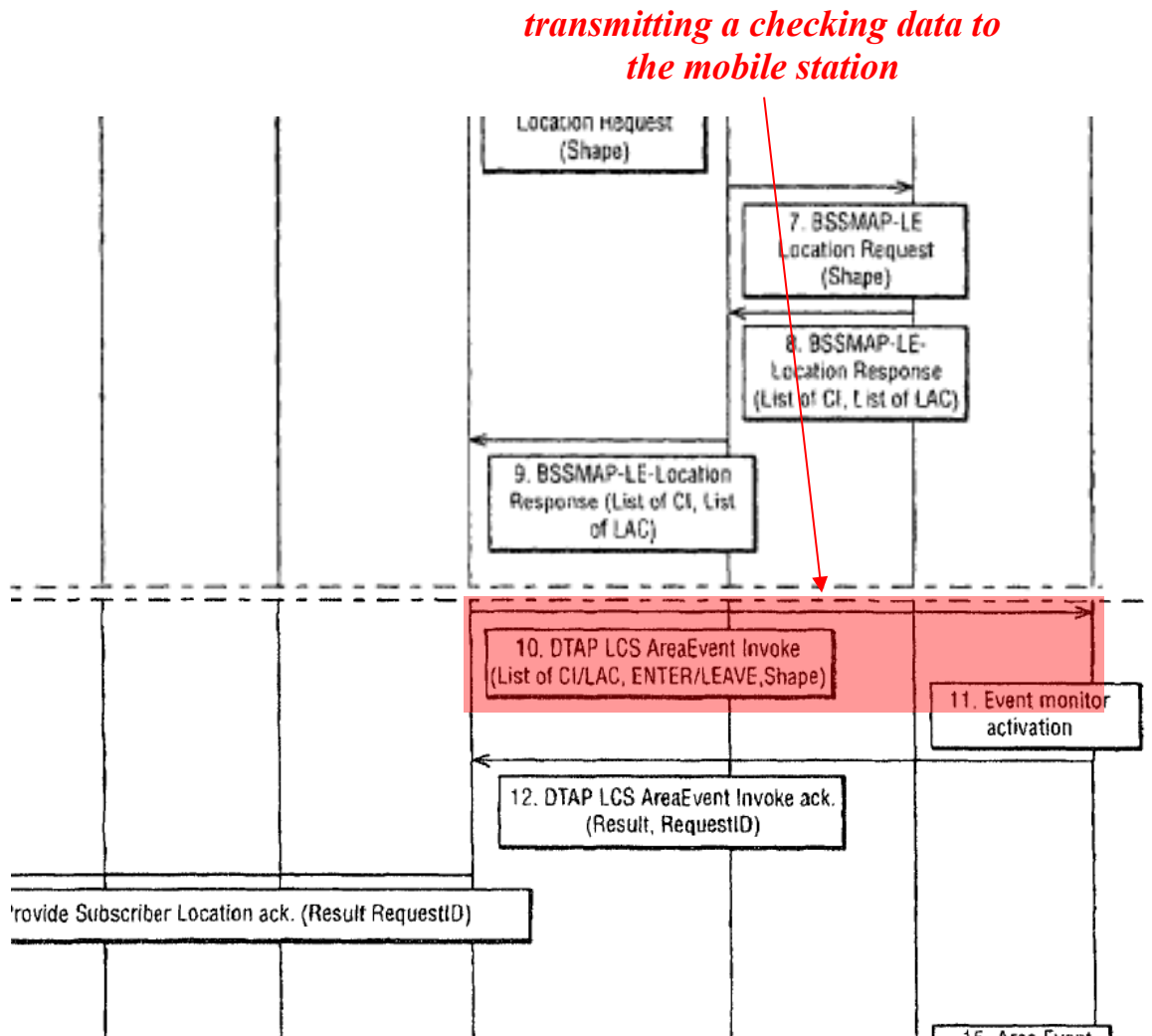
geographic areas associated with special tariff rates (*taking into account the presence of the mobile station in each of the special areas*). Andersson, 8:48-67, 2:40-45, 13:63-14:2, FIG. 2D.

**154.** Therefore, the combination of Kraufvelin, Hashimoto, and Andersson renders obvious *routing the updating signal from the mobile telephone network to special operating means* (sending the contents of the LCS report in a MAP report to the GMLC 12, HLR 9, and/or LCS Client 8) *that adapt the value of at least one operating parameter taking into account the presence of the mobile station in each of the special areas* (updating the currently applied tariff rate as the mobile station enters a new cell).

- i. **[1.8] (f) associating the special areas with the mobile station by transmitting a checking data to the mobile station,**

**155.** As explained above at limitation [1.2], Kraufvelin describes transmitting a list of cell IDs corresponding to the area of interest 5 to the mobile station 1. “The geographical area 5 may be translated into a list of Cell Ids.” Kraufvelin, [0056]. “The list of cells may then be sent to the mobile station 1.” Kraufvelin, [0060]. The information sent to the mobile station may include a “[l]ist of CGIs, LACs within the boundaries of the shape provided in the request.” Kraufvelin, [0066]. “the SMLC may then make the conversion of the shape into a list of CGIs and LACs” which sent, via “the BSC” “to the user equipment (UE).”

Kraufvelin, [0071]-[0072]. The mobile station then “stores the list of CGIs...to the memory thereof and activates the monitoring, step 11.” Kraufvelin, [0073]. These steps are illustrated as steps 7-10 in Figure 4, below.



**Kraufvelin, Fig. 4 (annotated)**

156. Thus, Kraufvelin describes *associating the special areas with the mobile station by transmitting a checking data to the mobile station* (sending **the list of cell IDs of the area of interest 5** to the mobile station).

- j. [1.9] *this checking data being sent to any mobile station whose presence in the special areas is monitored and being used by the mobile station for determining whether or not the defining signal received is a distinctive defining signal that defines, alone or with other distinctive defining signals, one or more of the special areas associated with the mobile station.*

157. When the LCS client 8 requests that the location of a mobile station be monitored, it may indicate multiple mobile stations, i.e., “one **or more** of the mobile stations of the cellular system.” Kraufvelin, [0048]. Kraufvelin explains that the request may include multiple stations (plural): “predefined information concerning the location of the mobile **stations**.” Kraufvelin, [0047]. If the LCS client 8 identifies multiple mobile stations, the list of cell IDs (*checking data*) for the corresponding area of interest is sent to all mobile stations identified in the request. Kraufvelin, [0055]. This designation of multiple stations enables great flexibility of Kraufvelin’s system without requiring significant changes to existing systems.

158. Therefore, the list of cell IDs corresponding to the area of interest 5 would be sent to any or all the mobile stations of the “one or more...mobile stations” that are to be monitored, which describes *this checking data being sent to any mobile station whose presence in the special areas is monitored*.

159. In addition, as described at limitation [1.3], Kraufvelin explains that the mobile station uses the list of cell IDs it receives (*checking data*) to determine if it is receiving a cell ID within that list from a base station (*a distinctive defining*

*signal*). Kraufvelin, [0079]-[0080], [0056]-[0060]. As described at limitation [1.2], a cell ID transmitted by each base station is a *defining signal*. A cell ID of one of the cells of the area of interest 5 is also a *radio distinctive defining signal*, because it at least partially defines the area of interest 5. *See* limitation [1.1].

**160.** In Kraufvelin, when a mobile station enters a new cell, it receives a new cell ID (*defining signal*) and compares it to the stored list of cell IDs (*checking data*). If there is a match, it determines that the new cell ID (*defining signal*) is a cell ID of one of the base stations of the area of interest (a *radio distinctive defining signal*). Kraufvelin, [0079]-[0080].

**161.** Thus, Kraufvelin describes *this checking data being sent to any mobile station whose presence in the special areas is monitored* (including multiple mobile stations in a location monitoring request and sending cell IDs to all identified mobile stations) *and being used by the mobile station for determining whether or not the defining signal received is a distinctive defining signal that defines, alone or with other distinctive defining signals, one or more of the special areas associated with the mobile station* (comparing new cell ID of new cell to the list of cell IDs corresponding to the area of interest 5 to determine if it is included in the list).

## **2. Claim 2**

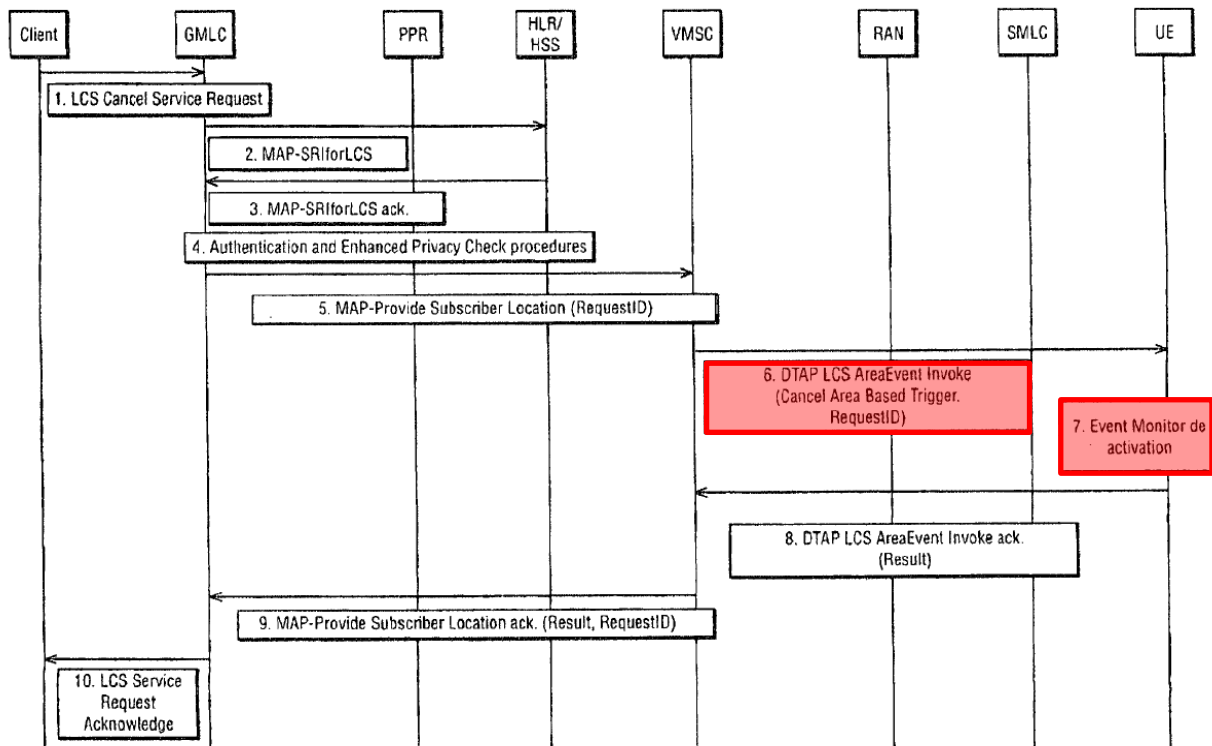
- a. **[2.0]** *The method according to claim 1 further comprising, sending a deactivation signal from the mobile telephone network to the mobile station to stop the mobile station from recognizing a defining signal*

*that defines the special area as a distinctive one in order to deactivate that special area for the mobile station.*

162. Kraufvelin describes a request for location-monitoring process as a “deferred location request.” Kraufvelin, [0062]. Figure 15 “illustrates the procedures for **cancelling** a Deferred Location Request.” Kraufvelin, [0089].

163. At step 6, “[t]he MSC may...send a DTAP LCS-AreaEventInvoke message...to the UE carrying the RequestID and **an indication that the corresponding Deferred Location Request is cancelled.**” Kraufvelin, [0091]. This message is described as a “Cancel Area Based Trigger.” Kraufvelin, Fig. 15.

Fig. 15



Kraufvelin, Fig. 15 (annotated)

**164.** At step 7, the mobile station (UE) performs “Event Monitor de-activation,” which “de-activates the monitoring and purges the corresponding list of CGIs, LACs and Shape.” Kraufvelin, Fig. 15 (step 7), [0091]. This *stop[s] the mobile station from recognizing a defining signal that defines the special area as a distinctive one*, because it no longer recognizes cell IDs from the area of interest. Kraufvelin, [0091]. This deactivation signal is sent at step 6 of Figure 15.

### **3. Claim 5**

- a. [5.0] *The method according to claim 1, wherein at least one radio communication defining device is a base station whose radio distinctive defining signal is a distinctive signal comprising a special mobile telephone network identification code, the checking data associated with this base station including this special mobile telephone network identification code.***

**165.** As explained at limitation [1.1], Kraufvelin’s base stations are *radio communication defining device[s]*. Kraufvelin, [0039]. In one embodiment, the base station’s cell ID (*radio defining signal*) defines the area of interest 5. In other embodiments, the signal “for the area definition” may additionally or alternatively “be defined based on Cell Group Identities (CGI), Service Area Identities (SAI), Location Area[] Codes (LAC), Routing Area (RAC) and so on.” Kraufvelin, [0057]. These identification codes from Kraufvelin render obvious *a special mobile telephone network identification code*. Kraufvelin, [0079]; see limitation [1.1].

**166.** As explained at limitation [1.8]-[1.9], a “DTAP LCS-AreaEventInvoke message” is transmitted to Kraufvelin’s mobile station that carries the list of identification codes that defines the area of interest 5 (*checking data*). Kraufvelin, Fig. 4 (step 10), [0011], [0025], [0056]-[0060], [0066]-[0070]. This list may include “CGIs, SAIs, RACs or LACs and so on” depending on how the area of interest 5 is defined. Kraufvelin, [0072] (describing checking data as “the List of CGIs, SAIs, RACs or LACs and so on”), Fig. 4 (step 10), Fig. 9.

**167.** In Kraufvelin’s embodiment in which a base station transmits “CGIs, SAIs, RACs or LACs and so on,” these identification codes are *associated with* the transmitting base station. Kraufvelin, [0072]. Just as Cell IDs are associated with base stations to define an area of interest by their coverage area, *see* Kraufvelin, [0040], [0053], “the area may be defined based on Cell Group Identities (CGI), Service Area Identities (SAI), Location Area Codes (LAC), Routing Area (RAC) and so on.” Kraufvelin, [0056], [0070]-[0073]. Thus, the base stations within an area of interest may additionally or alternatively have an associated CGI, SAI, RAC or LAC—a *special mobile telephone network identification code*.

**168.** Thus, Kraufvelin describes *wherein at least one radio communication defining device is a base station* (base station 6 associated with area 5) *whose radio distinctive defining signal is a distinctive signal comprising a special mobile telephone network identification code* (CGI, SAI, LAC, or RAC), *the checking data*

*associated with this base station including this special mobile telephone network identification code (Cell ID of base station 6 and CGI, SAI, LAC, and RAC stored on mobile station).*

**4. Claim 6**

- a. [6.0]** *The method according to claim 1, wherein at least one radio communication defining device is a base station whose radio distinctive defining signal is a distinctive base station identity signal comprising an identification code of the base station, the checking data associated with this base station including this base station identification code.*

**169.** As explained at limitation [1.1], Kraufvelin's base stations are *radio communication defining device[s]* and the signal transmitted from base stations within the area 5 is *a radio distinctive defining signal*. Kraufvelin, [0039], [0079].

**170.** A cell ID transmitted from a base station within the area of interest is *a distinctive base station identity signal comprising an identification code of the base station*.

**171.** As explained at claim 5 and limitation [1.1], because the cell IDs and/or "CGIs, SAIs, RACs or LACs," Kraufvelin, [0072], of base stations within the area of interest 5 are *radio distinctive defining signal[s]*, and because these cell IDs are stored in the list (*checking data*), they are *associated* with their respective base stations.

172. Thus, Kraufvelin describes *wherein at least one radio communication defining device is a base station* (base station 6 associated with area 5) *whose radio distinctive defining signal is a distinctive base station identity signal comprising an identification code of the base station* (transmitting cell ID of area 5), *the checking data associated with this base station including this base station identification code* (Cell ID of base station 6 included within list corresponding to area 5 stored on mobile station).

5. Claim 7

- a. [7.0] *The method according to claim 1, wherein the special operating means comprise a parameters database linking the special area to the mobile station and to a set of one or more operating parameters; and a value of at least one operational parameter of this set is adapted when an updating signal signaling that the mobile station exits or enters the special area is received.*

173. As explained at limitation [1.7], Kraufvelin's GMLC 12, HLR 9, and LCS Client 8 in combination with Andersson's teachings regarding a database teaches a *special operating means*. See limitation [1.7].

174. In Andersson's Figure 2A, the HLR 24 is *a parameters database* because it is described as a database and stores parameters. Specifically, Andersson says that the "Home Location Register (HLR) 24 is a **data base**." Andersson, 4:48-51. The allowed cells list 112 indicates *the special area*. Andersson, 2:40-67 ("geographical restriction field" is a list of cells with a reduced tariff). The "allowed

cells list field 112...contains cell identifiers (e.g., Cell Global Identity [CGI]” for the cells of the particular area. Andersson, 5:57-60.

**175.** In addition, the MSISDN 102 and/or IMSI 104 indicate *the mobile station*. Specifically, “[t]he MSISDN field 102...**uniquely identifies a mobile telephone subscription.**” Andersson, 5:25-29. Further, the IMSI field 104 of record 100A...is a **unique identity allocated to each subscriber.**” Andersson, 5:30-35.

**176.** The currently applied tariff rate is *at least one operational parameter* that is *adapted* as the mobile station enters an area of an allowed cells list, indicated by sending *an updating signal*. Andersson explains that “[i]n accordance with another mode known as ‘soft’ restriction, a first (e.g., reduced) tariff is applied to calls originated and received in cells listed in a geographical restriction field of the subscriber’s record in the home location register, with calls to and from other cells being permitted at a second (e.g., standard) tariff.” Andersson, 2:40-45. These varying tariff rates are “indicated by fields 120D, 122D, and 124D” in Fig. 2D. Andersson, 8:35-38. To apply the varying tariff rates, as explained at limitation [1.7], “a flag set in restriction control field 110 indicates that mobile subscriber N is to be accorded a low tariff...in the allowed cells which are stored in the allowed cells list field 112.” Andersson, 5:52-57. The currently applied tariff rate renders obvious an *operational parameter*. See Andersson, 8:35-67, 1:37-44, 5:41-45, 13:63-14:2

177. Figures 2A-2D illustrate additional *operating parameter[s]*.  
Andersson, Figs. 2B-2D (Restricted times list #1 and #2, Tariffs #0, #1, and #2).

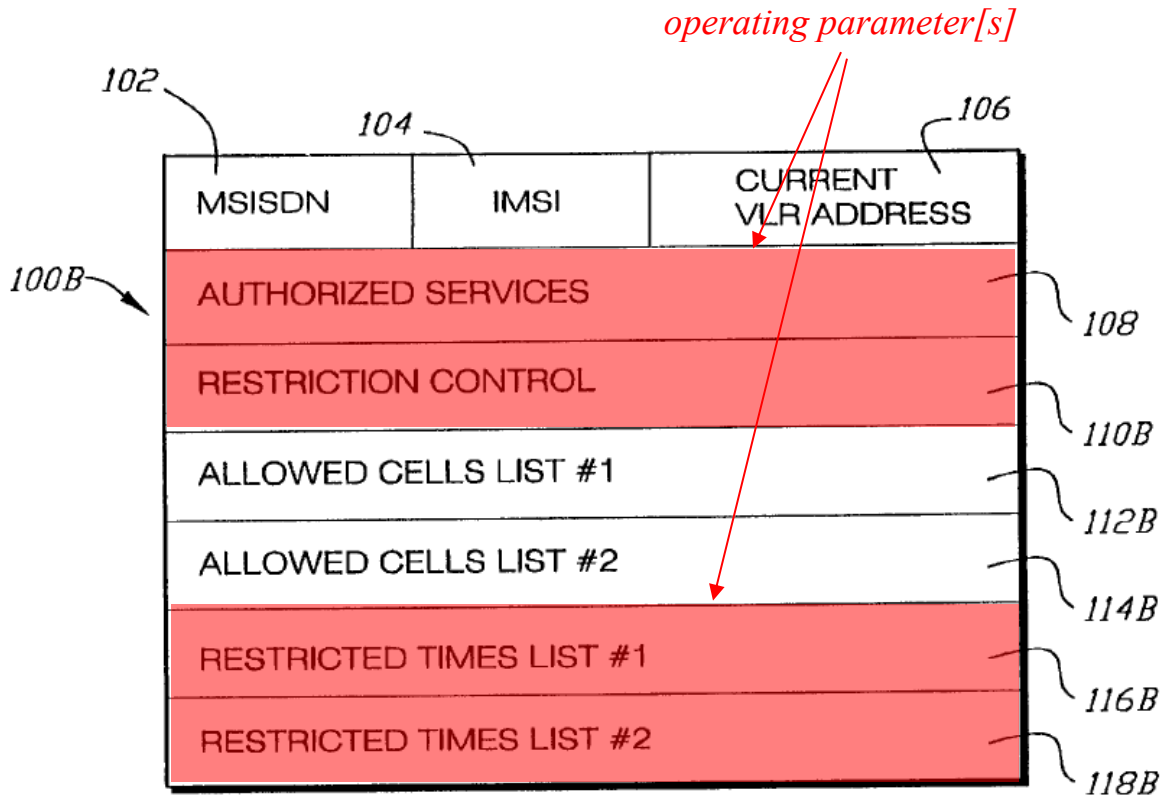
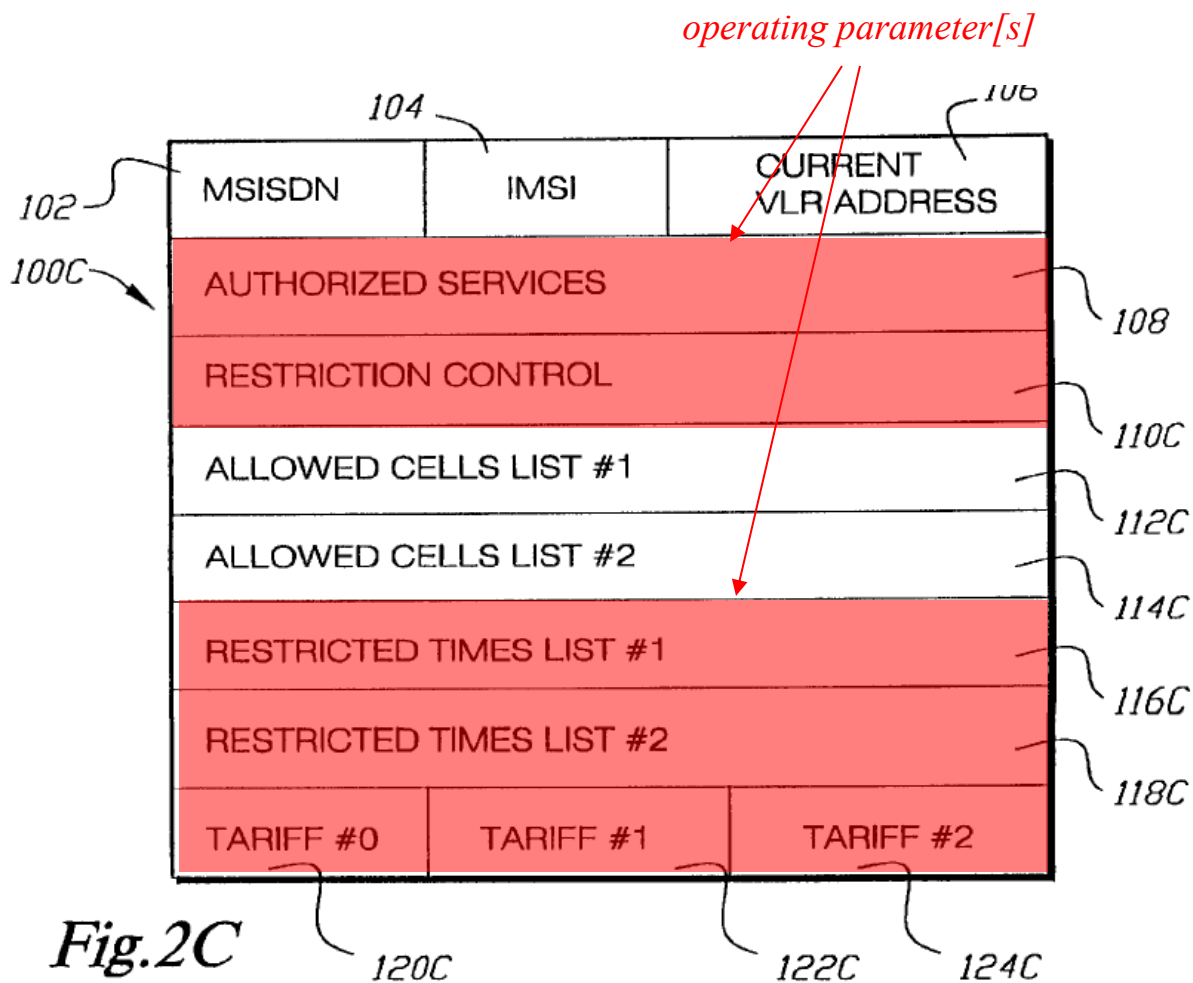
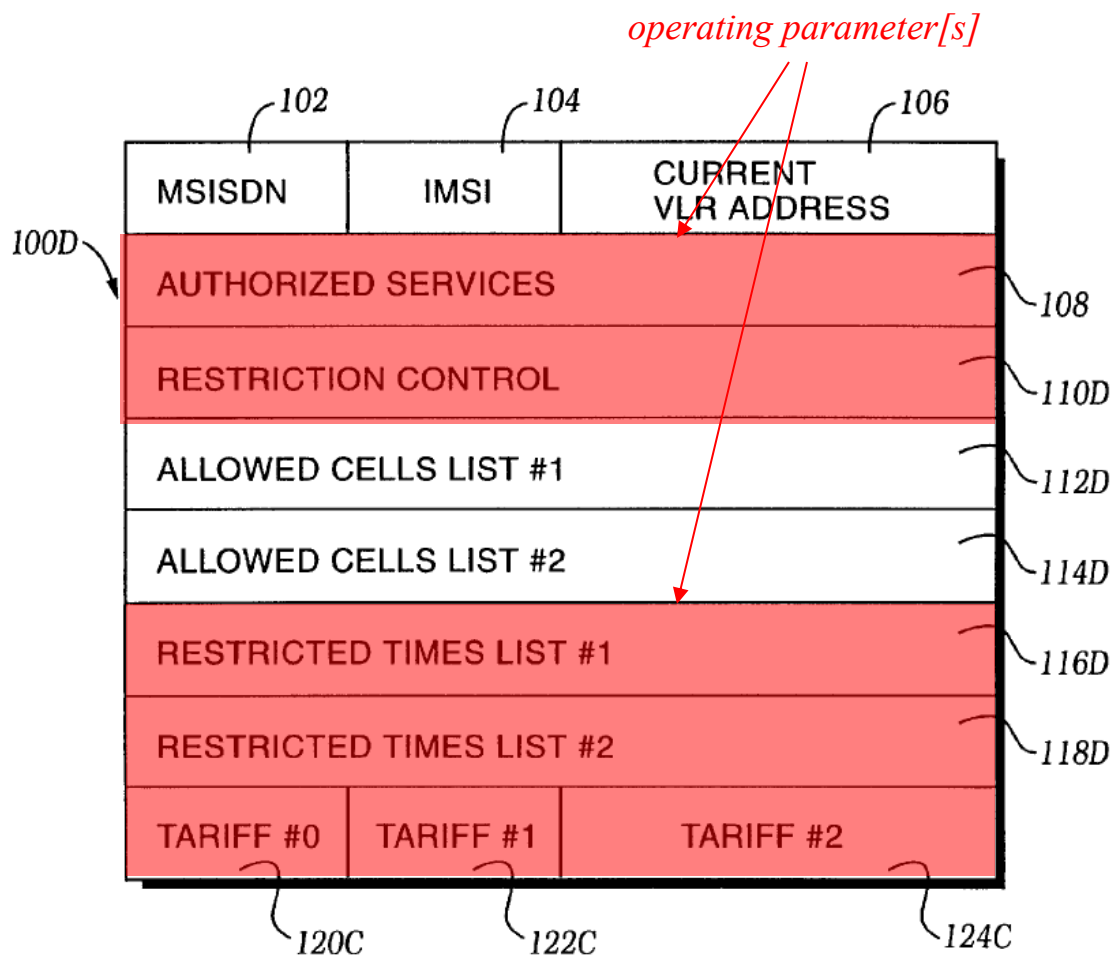


**Fig. 2B**

Andersson, Fig. 2B (annotated)



Andersson, Fig. 2C (annotated)



Andersson, Fig. 2D (annotated)

178. Andersson explains that these operational parameters are *adapted*. For example, “the contents of the current VLR address field 106 **must be updated as the mobile station MS moves.**” Andersson, 5:38-45. Likewise, the currently applied tariff rate is changed as the mobile station moves into or out of geographical areas. For example, the “flag” in the “restriction control field 110B” is “set,” i.e., *adapted*. Andersson, 7:30-37. A POSITA would have recognized that this disclosure of setting a flag is how the variable tariff rates are applied. To accomplish the objective

of applying variable tariff rates depending on the mobile station's location, Andersson explains that the contents of the subscriber record, shown in FIG. 2D must be updated so that the currently serving HLR/VLR has “**appropriate current information** about the mobile station.” Andersson, 1:37-44. This current information would include the tariff currently applied to the mobile station, which, like the VLR address, must be updated as the mobile station moves. In more detail, as a mobile station enters an area of interest, “**a first (e.g., reduced) tariff is applied**” whereas “calls to and from other cells” are “permitted at **a second (e.g., standard) tariff.**” Andersson, 2:40-45. In real time, Andersson's system “determin[es] in what cells the mobile station can be paged and from what cells the mobile station can originate calls at a first tariff rate” and “a second tariff rate.” Andersson, 13:63-14:2.

**179.** Kraufvelin's mobile station sends an updating signal when it enters or exits an area of interest. Kraufvelin, Fig. 4 (steps 11-14). In the combination, this updating signal causes the GMLC 12/HLR 9/LCS Client 8 to *adapt[] an operational parameter* (currently applied tariff) taught by Andersson. Andersson, 8:45-52.

**180.** Thus, the combination of Kraufvelin, Hashimoto, and Andersson renders obvious *wherein the special operating means* (GMLC 12/HLR 9/LCS Client 8) *comprise a parameters database* (HLR 24) *linking the special area* (allowed cells list) *to the mobile station* (MSISDN/IMSI) *and to a set of one or more operating*

*parameters (currently applied tariff rate, allowed cells list, restricted times, etc.); and a value of at least one operational parameter of this set is adapted when an updating signal signaling that the mobile station exits or enters the special area is received (updating currently applied tariff based on location of mobile station).*

**6. Claim 8**

- a. [8.0] *The method according to claim 1, wherein the operating parameter is a tariff flag or a service flag that enables or disables a special tariff or a service for the mobile station.***

**181.** As explained at claim 7, Andersson's mobile subscriber record includes tariff flags indicating "particular tariff rates" based on the mobile station's location. Andersson, 8:35-57, 5:49-60. "[A] **flag set** in restriction control field 110 indicates that mobile subscriber N **is to be accorded a low tariff** in exchange for mobile subscriber N agreeing to use mobile station MS only in the allowed cells which are stored in the allowed cells list field 112 of record 100A." Andersson, 5:49-60, 8:35-57 ("**The same or another flag** in restriction control field 110D indicates that the mobile subscriber is also entitled to **lower tariffs** when calls are originated or received in the cells specified in one or more of the allowed cells lists (e.g., fields 112D and/or 114D).") Andersson, 8:35-57.

**182.** Because the currently applied tariff indicates a standard rate outside the special area or a reduced rate when within the special area, it renders obvious *a tariff flag...that enables or disables a special tariff...for the mobile station.*

**7. Claim 10**

- a. **[10.0]** *The method according to claim 1 further comprising, receiving by the mobile station the checking data from the mobile telephone network or a signal of at least one radio device or from manual input.*

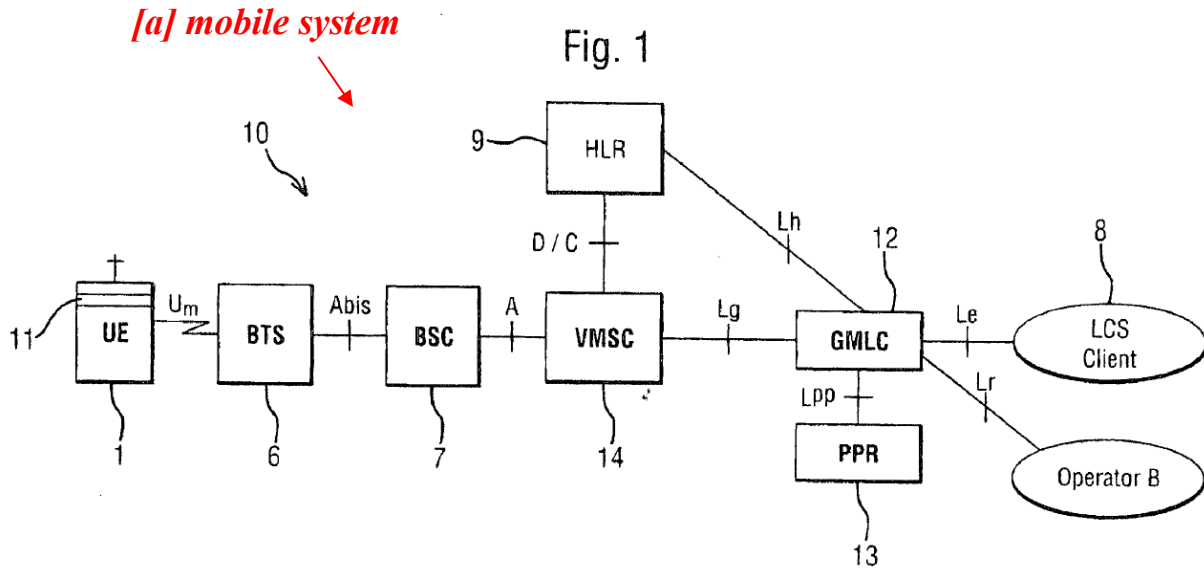
**183.** As discussed at limitation [1.9], and illustrated in Figure 4, Kraufvelin's mobile station receives *checking data* (i.e., list of cell IDs corresponding to the area 5) *from the mobile network*. Kraufvelin, [0060], [0066]-[0073], Fig. 4.

**8. Claim 11**

- a. **[11.0]** *A mobile system for monitoring the presence of a mobile station in one or more special areas defined for this mobile station, said system comprising:*

**184.** Limitation [11.0] is similar to limitation [1.0]. The combination of Kraufvelin, Hashimoto, and Andersson renders obvious limitation [11.0] for the same reasons described at limitation [1.0] and those presented below. The analysis presented at limitation [1.0] is incorporated by reference as analysis for limitation [11.0].

**185.** Limitation [11.0] recites *[a] mobile system*. Kraufvelin describes “a communication system” or “cellular communication system,” below. Kraufvelin, Abstract, Fig. 1.



**Kraufvelin, Fig. 1 (annotated)**

**186.** Limitation [11.0] also recites *one or more special areas defined for this mobile station*. As explained at limitation [1.0], the area 5 is associated with the mobile station because the LCS Client request “indicates a geographical area of interest and the target subscriber.” Kraufvelin, [0055], [0063].

- b.** [11.1] *at least one radio communication defining device for repeatedly transmitting a radio distinctive defining signal that at least partially defines one of the special areas in at least one channel,*

**187.** Limitation [11.1] is similar to limitation [1.1]. The analysis presented at limitation [1.1] is incorporated by reference as analysis for limitation [11.1]. As explained at limitation [1.1], Kraufvelin’s base stations 6 renders obvious *at least one radio communication defining device*. Kraufvelin describes transmitting cell IDs (*radio distinctive defining signal*) from base stations 6 within area 5 *at least partially*

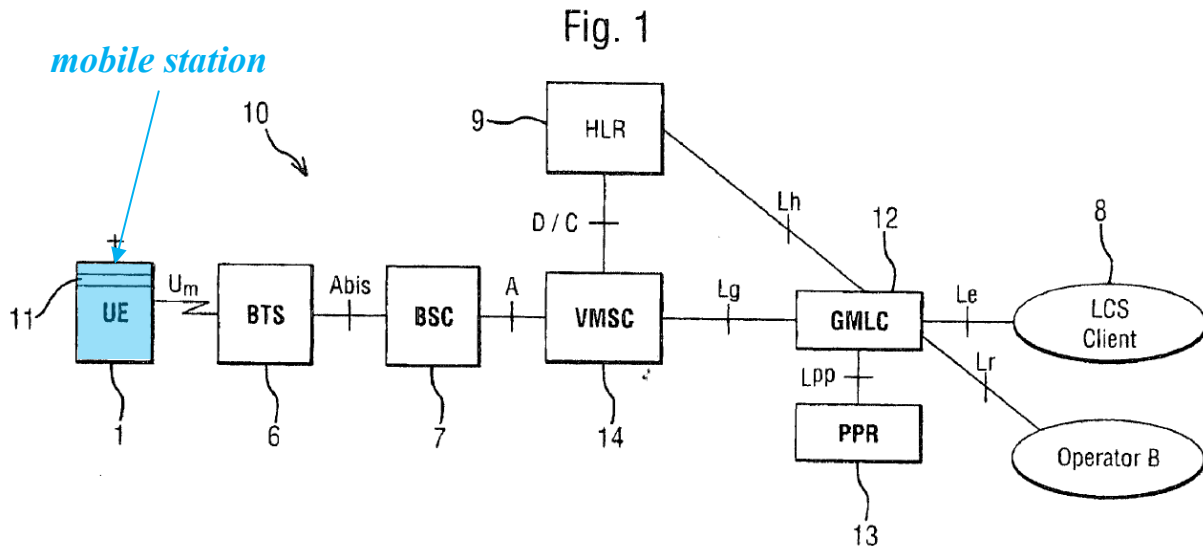
*defin[ing] one of the special areas.* The cell ID is transmitted in the BCCH channel (*in at least one channel*). See limitation [1.1].

- c. **[11.2] *special operating means for adapting the value of at least one operating parameter taking into account the presence of the mobile station in each of the special areas, and***

**188.** Limitation [11.2] is substantially similar to limitation [1.7]. The analysis presented at limitation [1.7] is incorporated by reference as analysis for limitation [11.2]. The Kraufvelin-Hashimoto-Andersson combination renders limitation [11.2] obvious for the same reasons described at limitation [1.7].

- d. **[11.3] *a mobile station, comprising:***

**189.** The combination of Kraufvelin, Hashimoto, and Andersson renders obvious limitation [11.3]. As explained at limitation [1.0], Kraufvelin's "mobile station 1" is illustrated in Figures 1, 2, and 4. Kraufvelin, [0048], [0041]. The analysis presented at limitation [1.0] is incorporated by reference as analysis for limitation [11.3].



Kraufvelin, Fig. 1 (annotated)

e. [11.4] *storage for storing a checking data,*

190. The list of cell IDs renders obvious *checking data*. See limitation [1.8]-[1.9]. The analysis presented at limitations [1.8]-[1.9] is incorporated by reference as analysis for limitation [11.4]. It is stored in storage of the mobile station. Kraufvelin, [0011] (“Information...for the area definition is stored at the mobile station.”). The mobile station “stores the list of CGIs, and other possible information to the memory thereof.” Kraufvelin, [0073]; [0060], [0079], Fig. 4 (steps 7-11).

f. [11.5] *observing means for observing said at least one channel, and*

191. Limitation [11.5] is similar to limitation [1.2] (*observing the channel*). The analysis presented at limitation [1.2] is incorporated by reference as analysis for limitation [11.5]. The Kraufvelin-Hashimoto-Andersson combination renders

obvious limitation [11.5] for the same reasons described at limitation [1.2] and those described below. The Kraufvelin-Hashimoto-Andersson combination describes both the function and corresponding structure of *observing means*.

**192.** The combination of Kraufvelin, Hashimoto, and Andersson describes *observing the channel*, which renders obvious “observing at least one channel.” See limitation [1.2].

**193.** The mobile station includes a “monitoring entity (ME).” Kraufvelin, [0079]. After the mobile station receives the list of cell IDs to monitor (*checking data*) it “wait[s] for a trigger event.” Kraufvelin, [0076], Fig. 4 (step 11).

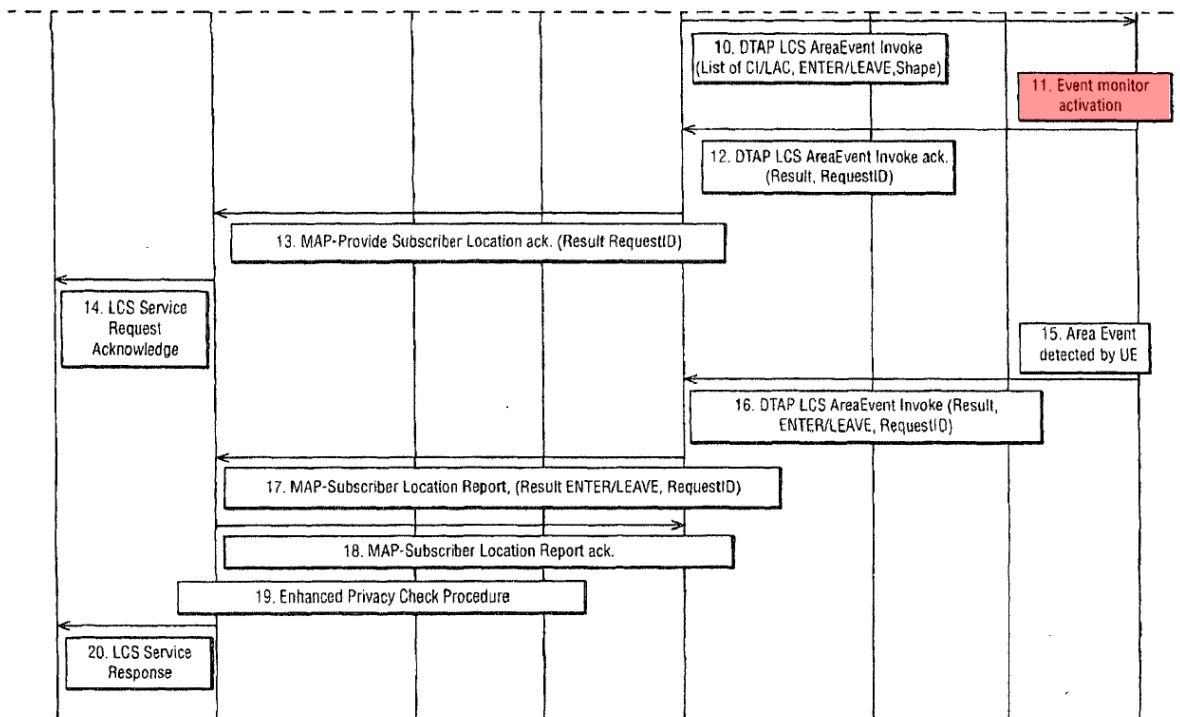


Fig. 4 (Contd.)

**Kraufvelin, Fig. 4 (annotated)**

194. Kraufvelin also describes the corresponding structure, including a processor executing software that performs the function above. “The user equipment such as the mobile station 1 may be provided with...a processor unit.” Kraufvelin, [0042]; *see also* [0094].

195. This processor executes multiple applications and/or software that perform the described functionality. For instance, an “application...run[s] in the Subscriber Identity Module (SIM) of the mobile station.” Kraufvelin, [0013]. Kraufvelin describes an “area event monitoring application” that enables or disables itself to perform the observing function. Kraufvelin, [0082]. “**The monitoring functionality** required on the mobile station side may be implemented in the terminal itself” and “could be an application running in the controller means of the mobile station.” Kraufvelin, [0093]; *see also* [0022] (“monitoring means”); [0079] (“monitoring entity (ME)”).

- g. [11.6] *processing means for processing any received signal in order to determine whether or not the signal received is a defining signal and, if the signal received is a defining signal, for determining based on the checking data whether or not the signal received is a distinctive defining signal and whether or not the mobile station is present in the special area,*

196. Limitation [11.6] is similar to limitation [1.3]. The analysis presented at limitation [1.3] is incorporated by reference as analysis for limitation [11.6]. The combination of Kraufvelin, Hashimoto, and Andersson renders obvious limitation

[11.6] for the same reasons described at limitation [1.3] and those provided below.

The combination of Kraufvelin, Hashimoto, and Andersson renders obvious both the function and corresponding structure of *processing means*.

**197.** The function of *processing means* is recited in the language of limitation [11.6]. For the reasons described at limitation [1.3], the combination of Kraufvelin, Hashimoto, and Andersson renders obvious this function.

**198.** Kraufvelin also describes the corresponding structure. The mobile station includes a processor. Kraufvelin, [0042] (“user equipment” includes “a processor unit”); [0094]. “When the Cell ID is updated as the subscriber is moving the mobile station 1 **will check the new Cell ID against the list. If there is a match,** the mobile station 1 sends a report back to the network.” Kraufvelin, [0060]. The algorithm that performs this checking is executed by the mobile station’s processor. Kraufvelin, [0042], [0094].

- h.** [11.7] *and the mobile station further comprising transmission means for sending, at least one of (i) periodically, (ii) when the mobile station enters into or exits from one of the special areas, and (iii) when the mobile station remains into a special area an updating signal, that is uncorrelated to any mobile station phone call establishment, regarding the presence of the mobile station in one or more of the special areas from the processing means to the special operating means.*

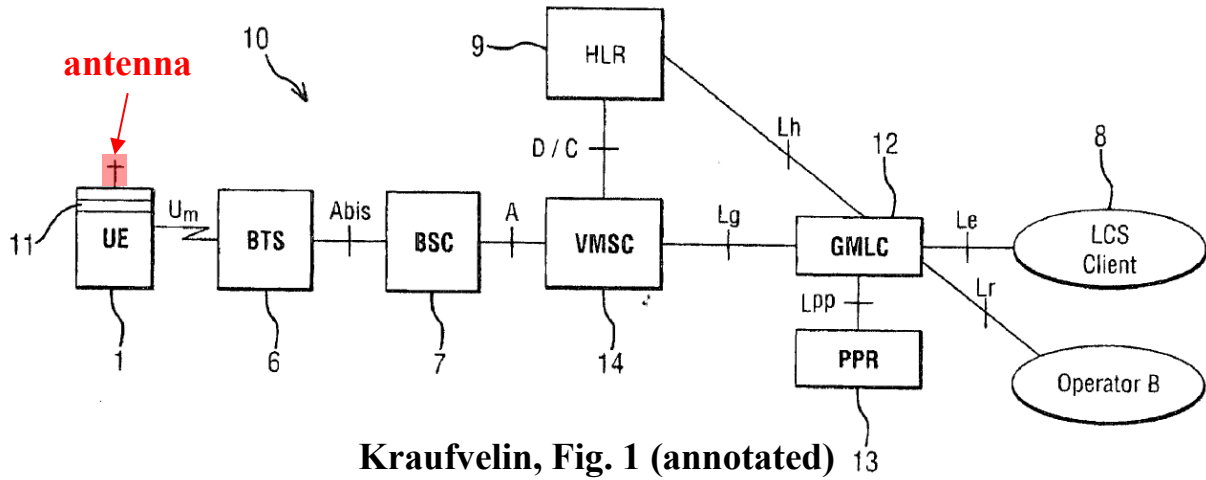
**199.** Limitation [11.7] is similar to limitation [1.4]-[1.6]. The analysis presented at limitations [1.4]-[1.6] is incorporated by reference as analysis for

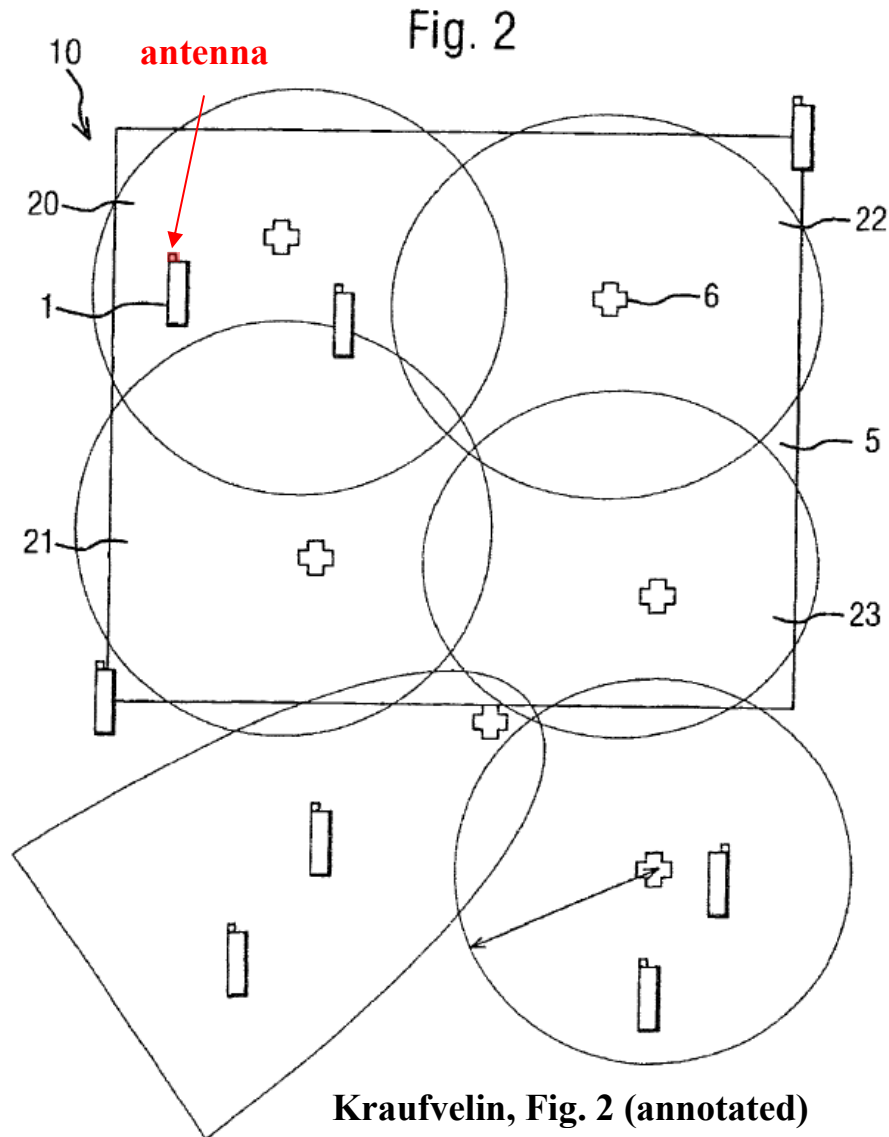
limitation [11.7]. The combination of Kraufvelin, Hashimoto, and Andersson renders obvious limitation [11.7] for the same reasons described at limitation [1.4]-[1.6] and those provided below. The combination of Kraufvelin, Hashimoto, and Andersson renders obvious both the function and corresponding structure of *transmission means*.

**200.** The recited function of *transmission means*, including sending an updating signal, is recited in the language of limitation [11.7]. For the reasons described at limitation [1.4]-[1.6], the combination of Kraufvelin, Hashimoto, and Andersson renders obvious this function.

**201.** Kraufvelin also describes the structure, including “a processor unit” that executes various software to perform the recited functionality. Kraufvelin, [0042], [0094], [0013].

**202.** Kraufvelin describes hardware for transmitting a wireless signal—an “antenna.” Kraufvelin, [0040]; Figs. 1-2.





9. Claim 12

- a. [12.0] *The system according to claim 11, wherein the mobile system comprises special area location*

***monitoring means for monitoring the correct location of at least a part of one or more of the special areas.***

**203.** As explained above, it is my understanding that *special area location monitoring means* is construed as a means-plus-function term. Kraufvelin describes both the function and corresponding structure.

**204.** As explained in the context of claim 4, in addition to sending the list of cell IDs to the mobile station, “the shape” of the area 5 “may be conveyed.” Kraufvelin, [0095]. The mobile station can verify whether it is within the area 5 and monitor whether the list of cell ID corresponds to *the correct location of...the special areas* to perform “a verification—or ‘sanity’ check—of the response from the terminal” to “**be sure that the terminal is actually in the geographical area as intended.**” Kraufvelin, [0107]-[0109], [0011].

**205.** Kraufvelin also describes the structure, including a processor that executes software that performs the recited function. Kraufvelin, [0042], [0094].

## **10. Claim 13**

### **a. [13.0] *A mobile station, comprising:***

**206.** Limitation [13.0] is identical to limitation [11.3]. The analysis presented at limitation [11.3] is incorporated by reference as analysis for limitation [13.0]. The combination of Kraufvelin, Hashimoto, and Andersson renders obvious limitation [13.0] for the reasons at limitation [11.3].

- b. **[13.1]** *observing means to observe a channel and process any received signal in order to determine whether or not it is receiving a defining signal,*

**207.** Limitation [13.1] is similar to limitation [1.2]. The analysis presented at limitation [1.2] is incorporated by reference as analysis for limitation [13.1]. The Kraufvelin-Hashimoto-Andersson combination renders limitation [13.1] obvious for the reasons at limitation [1.2].

**208.** As explained at limitation [11.5], Kraufvelin and Hashimoto describe *observing means to observe a channel*. See limitation [1.2]; limitation [11.5]; VIII.B; Kraufvelin, [0076], [0079], Fig. 4 (step 11). The analysis presented at limitation [11.5] is incorporated by reference as analysis for limitation [13.1].

**209.** Kraufvelin's mobile station additionally *process[es] any received signal in order to determine whether or not a defining signal is received*, as explained at limitation [1.2] above. See limitation [1.2]; VIII.B.

**210.** Kraufvelin's mobile station receives multiple signals (voice, SMS, and data). Kraufvelin, [0013], [0112], [0119]. As explained at limitation [1.1], cell identification information is received in the BCCH channel. Hashimoto, [0135]. Receiving and identifying a signal as sent over BCCH/SCH renders obvious *processing any received signal by the mobile station in order to determine whether or not it is receiving a defining signal*. See limitation [1.2]; Ramesh, [0007]; Ostberg, [0009]; Madsen, [0036]; Delaveau, [0206].

**211.** Kraufvelin and Hashimoto render obvious the structure of *observing means* for the reasons described at limitation [11.5].

- c. **[13.2]** *a processor to process any received defining signal and to determine, based on a previously obtained checking data, whether or not the defining signal received is a distinctive defining signal that at least partially defines a special area,*

**212.** Limitation [13.2] is similar to limitation [1.3]. The analysis presented at limitation [1.3] is incorporated by reference as analysis for limitation [13.2]. The combination of Kraufvelin, Hashimoto, and Andersson renders obvious limitation [13.2] for the same reasons provided at limitation [1.3], and those below.

**213. First,** Kraufvelin describes *a processor*. Kraufvelin, [0042], [0094].

**214. Second,** Kraufvelin explains that *determin[ing]...whether or not the defining signal received is a distinctive defining signal that at least partially defines a special area is based on a previously obtained checking data*. As explained at limitation [1.3], the mobile station determines whether a defining signal received (cell ID from base station 6) is a distinctive defining signal (one of the cell IDs on the list corresponding to the area of interest 5) by comparing the received cell ID to the list to check if there is a match. Kraufvelin, [0060], [0079]-[0080]. The list of cell IDs is *checking data*. See limitation [1.8]-[1.9]. It is obtained before the mobile station performs the comparison described. Kraufvelin, Fig. 4 (steps 1-10, generating list of cell IDs and transmitting to mobile station, occur before step 11, monitoring).

- d. **[13.3] to determine whether or not it is present in one or more special areas, and**

**215.** Limitation [13.3] is substantially similar to limitation [1.3]. The analysis presented at limitation [1.3] is incorporated by reference as analysis for limitation [13.3]. The combination of Kraufvelin, Hashimoto, and Andersson renders obvious limitation [13.3] for the same reasons described at limitation [1.3].

- e. **[13.4] to send an updating signal at least one of (i) periodically, (ii) when the mobile station enters into or exits from one of the special areas, and (iii) when the mobile station remains into a special area to a mobile telephone network about its presence in one or more special areas, where said updating signal sending is uncorrelated to any mobile station phone call establishment and is based on the last determination performed by the mobile station about its presence in the special areas.**

**216.** Limitation [13.4] is substantially similar to limitation [1.4]-[1.6]. The analysis presented at limitations [1.4]-[1.6] is incorporated by reference as analysis for limitation [13.4]. The combination of Kraufvelin, Hashimoto, and Andersson renders obvious limitation [13.4] for the same reasons described at limitation [1.4]-[1.6].

## **11. Claim 14**

- a. **[14.0] A non-transitory computer readable medium storing computer readable program code for causing a computer to perform a method, the method comprising:**

**217.** As explained at limitation [11.4], Kraufvelin's mobile station 1 includes a memory (*a non-transitory computer readable medium*). Kraufvelin, [0011], [0073].

**218.** As explained at limitation [11.5], Kraufvelin's mobile station executes software (*computer readable program code for causing a computer to perform a method*). Kraufvelin, [0013], [0051], [0082], [0093]. The analysis presented at limitations [11.4]-[11.5] is incorporated by reference as analysis for limitation [14.0].

- b.** [14.1] *(a) observing a channel and processing any received signal by the mobile station in order to determine whether or not it is receiving a defining signal,*

**219.** Limitation [14.1] is substantially similar to limitation [1.2] and the combination of Kraufvelin, Hashimoto, and Andersson renders limitation [14.1] obvious for the reasons described at limitation [1.2]. The analysis presented at limitation [1.2] is incorporated by reference as analysis for limitation [14.1].

- c.** [14.2] *(b) processing any received defining signal by the mobile station and the mobile station determines, based on a previously obtained checking data, whether or not the defining signal received is a distinctive defining signal that at least partially defines one of the special areas, and determines whether or not the mobile station is present in one or more of the special areas,*

**220.** Limitation [14.2] is substantially similar to limitation [1.3]. The analysis presented at limitation [1.3] is incorporated by reference as analysis for

limitation [14.2]. The combination of Kraufvelin, Hashimoto, and Andersson renders obvious limitation [14.2] for the reasons described at limitation [1.3]. The combination of Kraufvelin, Hashimoto, and Andersson renders obvious *based on a previously obtained checking data* for the reasons described at limitation [13.2].

- d. [14.3] *(c) sending an updating signal from the mobile station to a mobile telephone network about the mobile station presence in one or more of the special areas, where the updating signal sending is uncorrelated to any mobile station phone call establishment and is based on the last determination performed by the mobile station about its presence in each of the special areas, and said updating signal being sent at least one of (i) periodically, (ii) when the mobile station enters into or exits from one of the special areas, and (iii) when the mobile station remains into a special area.*

221. Limitation [14.3] is identical to limitation [1.4]-[1.6]. The analysis presented at limitations [1.4]-[1.6] is incorporated by reference as analysis for limitation [14.3]. The combination of Kraufvelin, Hashimoto, and Andersson renders obvious limitation [14.3] for the reasons described at limitation [1.4]-[1.6].

**X. GROUND 2: CLAIMS 3 AND 4 ARE UNPATENTABLE AS OBVIOUS OVER THE COMBINATION OF KRAUFVELIN, HASHIMOTO, ANDERSSON, AND SUNDAR**

**A. Summary of Sundar**

222. Sundar is a patent publication that explains concepts of how a mobile station may connect to cellular networks as well as WiFi networks. *See* Sundar, Title (54), Abstract. In more detail, Sundar describes methods “for internetworking WWAN” (cellular networks) “and WLAN” (WiFi networks). Sundar, Abstract.

Mobile stations before the priority date were capable of “communicat[ing] according to **an 802.XX wireless local area network** air interface protocol via WLAN logic or according to **a wireless wide area network** air interface protocol via WWAN logic.” Sundar, Abstract.

**223.** Like Kraufvelin, Hashimoto, and Andersson, Sundar’s mobile station stores a list of cell IDs to define a special area and compares new cell IDs to the list. Sundar, [0023]. Sundar also demonstrates that a mobile station may perform this same process using SSIDs of WiFi devices, instead of cell IDs of cellular base stations. Sundar, [0062]-[0063] (comparing a newly received “SSID with a list of SSIDs” to check for “a match”).

**B. Reasons to Combine Sundar with Kraufvelin, Hashimoto, and Andersson**

**224.** The combination of Kraufvelin, Hashimoto, and Andersson describes a mobile station that monitors its location. Specifically, Kraufvelin explains that the mobile station stores a list of cell IDs and checks a new cell ID against this list. Kraufvelin, [0079]-[0080]. Hashimoto explains that this new cell ID is broadcast by the associated base station. Hashimoto, [0135]. Andersson explains that the location data is stored in a database and describes various aspects of how the data is adapted as the mobile station moves throughout the network. Andersson, Figs. 2A-2D, 5:1-57, 8:52-67. Kraufvelin, Hashimoto, and Andersson describe their methods in the context of a cellular network system, such as a 3G cellular system. However,

Kraufvelin also explains the same principles it describes are not limited to 3G cellular systems, but “are also applicable to any other cellular communication system.” Kraufvelin, [0119]. A POSITA would have recognized that a WiFi system is also a cellular communication system with the cell being defined by a WiFi access point rather than a cellular base station. In addition, a POSITA would have been motivated to apply the teachings of Kraufvelin, Hashimoto, and Andersson to WiFi systems, with the coverage area of WiFi access points forming a special area as explained below. Kraufvelin, [0119]; Sundar, [0014].

**225.** Sundar is analogous to the '040 patent and within the same field of endeavor, describing monitoring the location of a mobile station. Sundar, [0017], [0067]; Ex.1001, Abstract. Sundar is reasonably pertinent to a particular problem with which the inventor of the '040 patent was involved (i.e., tracking mobile station location). Ex.1001, 1:65-2:3; Sundar, [0003].

**226.** A POSITA would have been motivated to include WiFi access points in Kraufvelin's system and implement Kraufvelin's location monitoring techniques to apply to both cellular base stations (WWAN networks) and WiFi access points (WLAN networks). As shown by Sundar, mobile stations were capable of communicating with access points of both WWAN networks and WLAN networks and techniques for switching between the two were well known. *See* Sundar, Abstract. Kraufvelin's methods are also not limited to WWAN networks.

Kraufvelin, [0119]. Sundar shows that the principles of comparing a transmitted ID to a stored list may be used with SSIDs of WiFi access points in addition to cell IDs of cellular base stations. In particular, in Sundar, a mobile station receives “a SSID” as “part of the beacon frame.” Sundar, [0062]. Just like Kraufvelin describes in the context of cell IDs of cellular base stations, in Sundar, “[t]he mobile station 310 compares this SSID with a list of SSIDs” and determines “if there is a match.” Sundar, [0062]-[0063]. A POSITA would have recognized that these techniques were compatible.

**227.** Applying Kraufvelin’s location monitoring techniques to WiFi access points using SSIDs would provide multiple advantages. WiFi access points typically have smaller coverage areas than cellular base stations, so location-accuracy would be improved. Kraufvelin’s LCS Client 8 would advantageously provide services based on the mobile station location within range of a WiFi access point, such as the user’s home, work, or other location. For example, a reduced tariff may be provided to a user when the user is connected to their home WiFi or work WiFi. In addition, some WiFi coverage areas may be outside of cellular service. Including WiFi access point SSIDs would allow Kraufvelin’s LCS Client 8 to monitor the mobile station location in these locations.

**228.** The combination of Kraufvelin, Hashimoto, Andersson, and Sundar also would have been the combination of the prior art elements of monitoring the

MS location via cellular or WiFi networks, as taught by Kraufvelin and Sundar. The combination would be according to known methods, including storing a list of SSIDs on a mobile station, as taught by Sundar. The combination would also yield the predictable result of a mobile station identifying its location based on receiving and comparing an SSID to the prestored list.

**229.** Further, a POSITA would have expected to succeed in making the combination. Sundar shows that mobile stations can communicate via both WWAN and WLAN network types. Sundar, Abstract. Kraufvelin and Sundar both describe updating signals regarding the MS location. Kraufvelin, [0079]-[0083]; Sundar, [0012] (“an update of the location of the handset may occur”). Therefore, a POSITA would have been motivated to combine Sundar with Kraufvelin, Hashimoto, and Andersson.

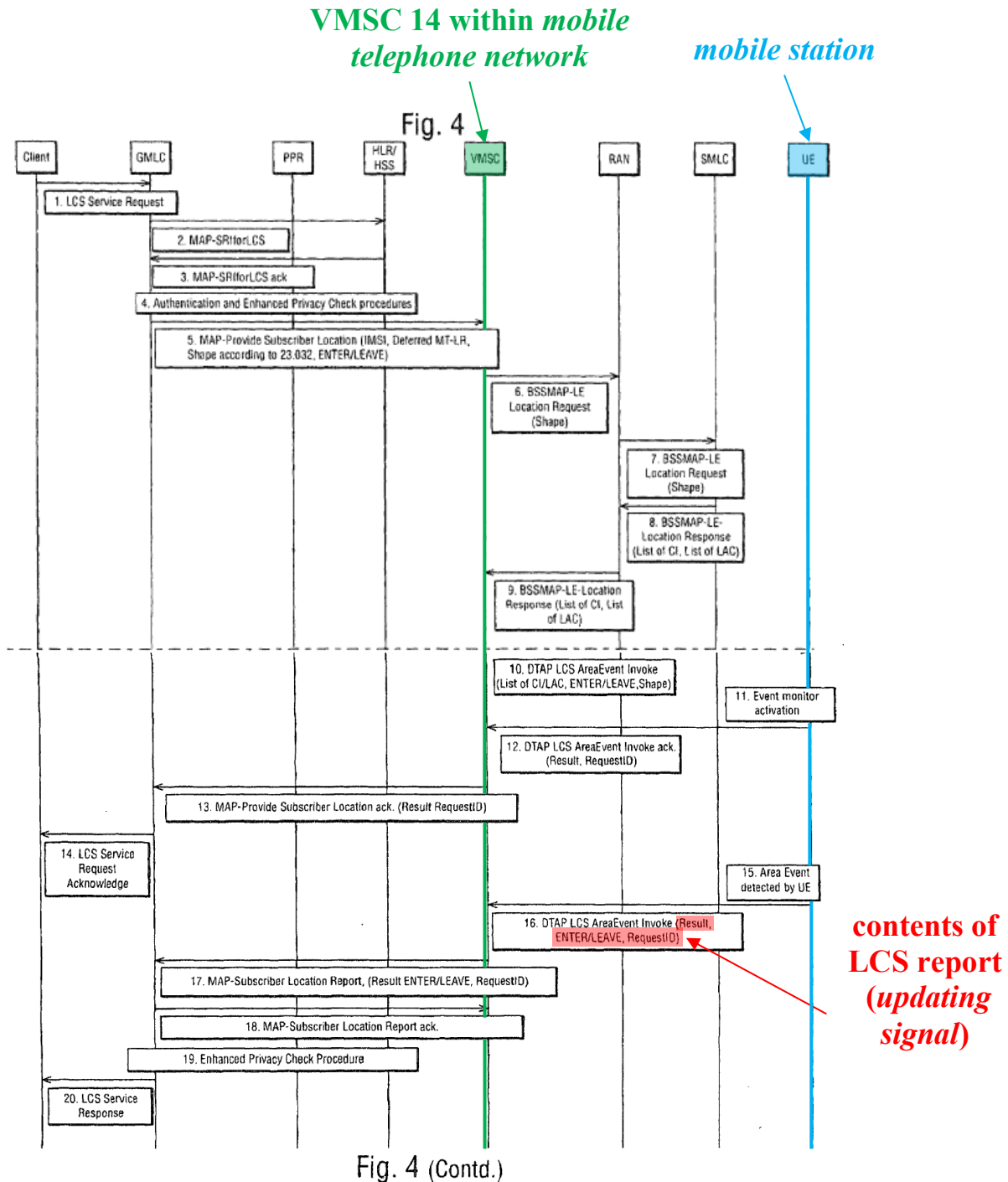
**230.** Further, a POSITA would have been motivated to implement Sundar’s teachings regarding sending an acknowledgement from a mobile network when it has received an updating signal from a mobile station. *See* Sundar, Fig. 10. Sending an acknowledgement to the mobile station would ensure that the mobile station does not attempt to resend the updating signal, thus conserving battery life, computational resources, and freeing up network channels.

**C. Detailed Analysis of Claims**

**1. Claim 3**

- a. **[3.0]** *The method according to claim 1 further comprising, acknowledging the reception of the updating signal by the special operating means and transmitting an acknowledgement signal from the special operating means to the mobile station.*

**231.** Kraufvelin describes sending *an updating signal* (contents of LCS report and MAP report, *see* limitation [1.4]-[1.7]) from the mobile station to the network, illustrated below.



**232.** While Kraufvelin does not describe an acknowledgement indicating reception of the updating signal, this was a well known, conventional step.

Sundar's mobile station sends a location update when it enters a new cell. "The BSC 106 transmits 904 a Location Update message to its serving MSC 110."  
Sundar, [0075].

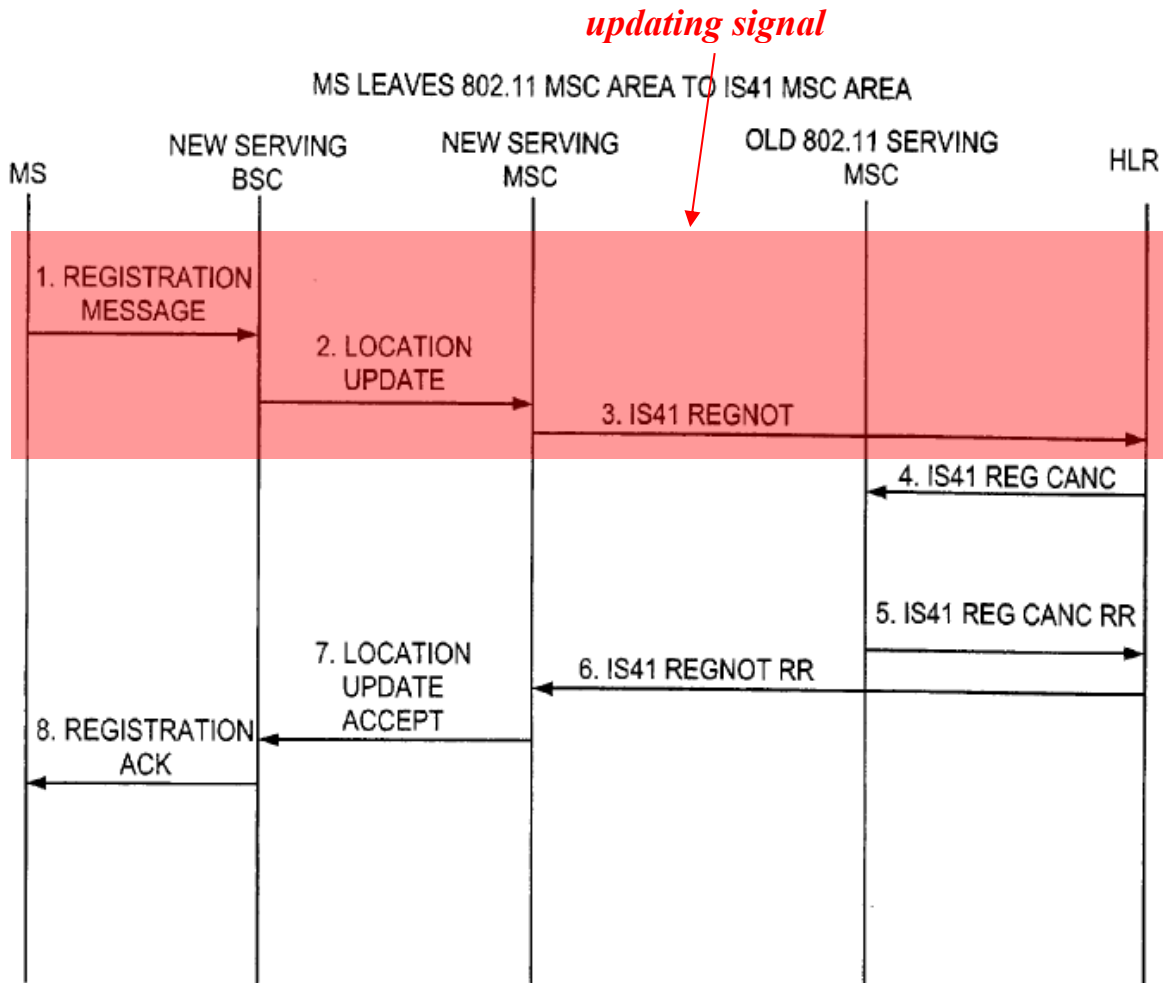


FIG. 10

Sundar, Fig. 10 (annotated)

233. Then, "[t]he BSC 106 acknowledges 918 the registration." Sundar, [0075].

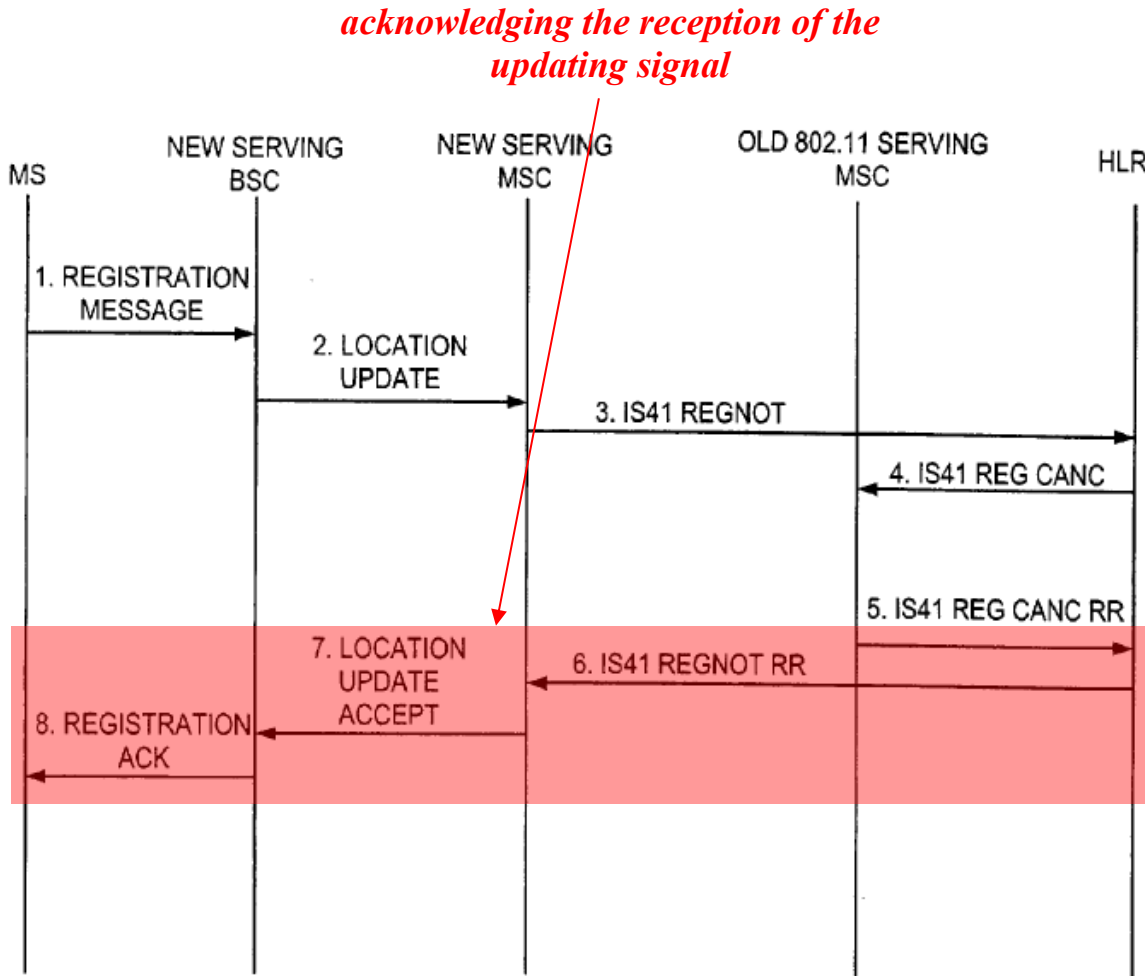


FIG. 10

Sundar, Fig. 10 (annotated)

234. A POSITA would have found it obvious, and would have been motivated, to include a registration ACK as taught by Sundar with Kraufvelin's system to improve data integrity and system efficiency. By receiving an ACK, Kraufvelin's mobile station would recognize that the updating signal was successfully received in its entirety and would not attempt to retransmit the signal, saving network bandwidth and battery power.

**2. Claim 4**

- a. **[4.0]** *The method according to claim 1, wherein at least one radio communication defining device is a wireless device whose radio distinctive defining signal is a distinctive wireless signal transmitted by the wireless device in a frequency range outside the frequency range allocated for the mobile telephone network, the distinctive wireless signal containing wireless device identification data and reliable information confirming that the wireless device is effectively located into a predetermined environment, and the checking data associated with this wireless device including the wireless device identification data.*

**235.** As explained at limitation [1.1], Kraufvelin's area 5 is defined by multiple cellular base stations (cells 20-23). Kraufvelin, Fig. 2, [0053], [0056], [0058], [0062]. The cell IDs are stored within the mobile station. Kraufvelin, [0056], [0058], [0060], Fig. 4 (step 10), [0079]-[0080].

**236.** A POSITA would have found it obvious for Kraufvelin's system to additionally include radio communication defining devices in the form of WiFi devices. In such a modified system, the area of interest 5 may also be defined by the coverage area of multiple base stations, WiFi access points, or a combination. This combination would be obvious because Sundar's mobile station stores lists of cell IDs and lists of SSIDs and compares received cell IDs and SSIDs to these lists exactly as Kraufvelin describes its stored lists. Sundar, [0023], [0062]-[0063]; Kraufvelin, [0056]-[0060], [0079]-[0080]. Sundar's WiFi access point is an "AP 204," which transmits "a 'beacon frame'...at regular intervals." Sundar, [0014],

[0017]. Just as Kraufvelin’s base stations repeatedly transmit cell IDs, “the AP sends a SSID...that identifies the AP 204.” Sundar, [0062].

**237.** Sundar’s “mobile station 310 **compares this SSID with a list of SSIDs.**” Sundar, [0062]. It “is **a priori provisioned with the valid list of SSIDs.**” Sundar, [0063].

**238.** Kraufvelin’s description of comparing a newly received cell ID to the stored list of cell IDs is compatible with Sundar’s teachings of comparing a newly received SSID to a stored list of SSIDs, a POSITA would have been motivated to make the combination. §X.D.2. In the combination, *at least one radio communication defining device* is also rendered obvious by a WiFi access point with an SSID within the list of SSIDs prestored on the mobile station. Sundar, [0014], [0062]-[0063]. The *radio distinctive defining signal* is rendered obvious by the SSID of the WiFi access point. Sundar, [0014], [0062]-[0063].

**239.** In the combination, the SSID (*radio distinctive defining signal*) is sent *in a frequency range outside the frequency range allocated for the mobile telephone network* because WiFi access points utilize a different frequency range than cellular base stations. Moon, [0022] (“[T]he WLAN system and the cellular mobile communication system provide services **using different frequency bands.**”); Lu, 1:41-62 (“802.11” and “a cellular network” “operate in vastly different frequency ranges”).

**240.** An SSID from a WiFi access point within the predefined list renders obvious a *radio distinctive defining signal*. An SSID is *wireless device identification data* because it “identif[ies] an access point.” Sundar, claims 4-5.

**241.** Kraufvelin explains that the mobile station may also receive “the shape used in the request” for verification purposes. Kraufvelin, [0095]. The mobile station can determine whether its “calculated position” is within “the submitted shape.” Kraufvelin, [0095]-[0096], [0107]-[0109], [0011]. In Sundar, GPS data may be sent to the mobile station to confirm that the WiFi access point is, indeed, within the area of interest as well as whether the mobile station is near the WiFi access point. Sundar, [0024], [0070], [0066]. Sundar further explains that this information can be sent in any suitable way, such as via SMS, SCP, or “by modifying the HLR or using a Proxy HLR entity.” Sundar, [0072]. Accordingly, in the combination, the shape and/or GPS data (*reliable information*) is included within the *radio distinctive defining signal*. Kraufvelin, [0095]-[0096]; Sundar, [0024], [0066]-[0072].

**242.** Sundar’s SSID is *wireless device identification data* because it identifies the associated WiFi access point. Sundar, claims 4-5.

**XI. GROUND 3: CLAIM 9 IS UNPATENTABLE AS OBVIOUS OVER THE COMBINATION OF KRAUFVELIN, HASHIMOTO, ANDERSSON, AND MCNUTT**

**A. Summary of McNutt**

**243.** McNutt provides an example of a specific service that may be provided to a mobile station based on the location of the mobile station. In particular, McNutt describes “an interactive wagering application that restricts wagering access.” McNutt, Abstract. Because “wagering is prohibited” in some locations, McNutt’s system “verif[ies] that the user equipment is in a location where wagering is permitted” before “provid[ing the user] with wagering access.” McNutt, Abstract. McNutt’s system determines the MS location in any suitable way. McNutt, [0007]-[0008].

**B. Reasons to Combine McNutt with Kraufvelin, Hashimoto, and Andersson**

**244.** The combination of Kraufvelin, Hashimoto, and Andersson describes monitoring the location of a mobile station and storing the information in a database. Kraufvelin describes monitoring the location of a mobile station by receiving the cell ID of a new cell and comparing the new cell ID to a list of cell IDs stored on the mobile station corresponding to an area of interest 5. *See* Kraufvelin, [0079]-[0080]. Hashimoto explains that the new cell ID is received by the mobile station because the base station of the new cell repeatedly broadcasts the cell ID. *See* Hashimoto, [0135]. Andersson explains various implementation details regarding how data

related to the location of a mobile station is stored in a database and updated. *See* Andersson, Figs. 2A-2D, 5:1-57, 8:52-67. Kraufvelin explains that these techniques may be used so “[d]ifferent kinds of services” may be provided based on location. Kraufvelin, [0012]. However, Kraufvelin leaves open the type of services that may be provided. Kraufvelin, [0012]. A POSITA would have been motivated to combine McNutt’s teachings regarding providing wagering services with the location monitoring methods described by Kraufvelin, Hashimoto, and Andersson, as described below.

**245.** McNutt is analogous to the ’040 patent and within the same field of endeavor as. McNutt describes providing services, specifically wagering services, to a mobile station based on the location of the mobile station. *See* McNutt, [0007] (“an interactive wagering application may determine user equipment location”). The ’040 patent describes providing location-based services. *See* Ex.1001, Abstract. McNutt is also applicable to a particular problem with which the inventor of the ’040 patent was involved (i.e., tracking mobile station location to provide location-based services). Ex.1001, 1:65-2:3; McNutt, Abstract.

**246.** In addition, a POSITA would have been motivated to implement McNutt’s teachings with Kraufvelin’s. Kraufvelin describes providing services based on the mobile station’s location. Kraufvelin, [0012]. McNutt describes a specific type of service—wagering—that is highly regulated by location, but leaves

open how its system obtains, monitors, or updates location information. McNutt, Abstract, [0004]-[0008]. Applying the service of McNutt to Kraufvelin's system advantageously expands the types of services offered to Kraufvelin's users. McNutt's teachings also advantageously account for various location-related regulations on services provided. *See* McNutt, Abstract, [0100].

**247.** Accordingly, the combination would have been the combination of prior art elements, including Kraufvelin's teachings of monitoring location and McNutt's teachings of location-based services. The combination would be made according to known methods, including comparing a received cell ID to a pre-stored list. The combination would also yield the predictable result of providing or restricting access to a wagering service based on location.

**248.** Further, a POSITA would have expected to succeed in making the combination. Kraufvelin does not limit the types of services provided. Kraufvelin, [0012]. McNutt's methods for determining location are left open. McNutt, [0007]-[0008]. Therefore, a POSITA would have been motivated to combine McNutt with Kraufvelin, Hashimoto, and Andersson.

## **C. Detailed Analysis of Claims**

### **1. Claim 9**

- a. **[9.0]** *The method according to claim 1, wherein the updating signal includes a request to access a service or multimedia content and the mobile telephone network routes this request to a part of the special operating*

***means that allow or forbid the provision of this service or multimedia content depending on whether or not the mobile station is into the special area.***

**249.** Both Kraufvelin’s and Andersson’s techniques of location monitoring provide various services or multimedia to the station. Kraufvelin, [0012] (“Different kinds of services are possible.”); Andersson, 5:49-60, 8:18-56. Providing these services renders obvious *access[ing] a service*. Providing “advertisements” renders obvious *multimedia content*. Kraufvelin, [0012]. However, Kraufvelin and Andersson do not explain whether these are provided in response to *a request*, as claimed.

**250.** McNutt describes providing “wagering access” based on “local rules” and in response to a request. McNutt, (54) (Title), [0004], [0100]. “At step 710, the user may attempt to access a wagering feature of the interactive wagering application.” McNutt, [0099].

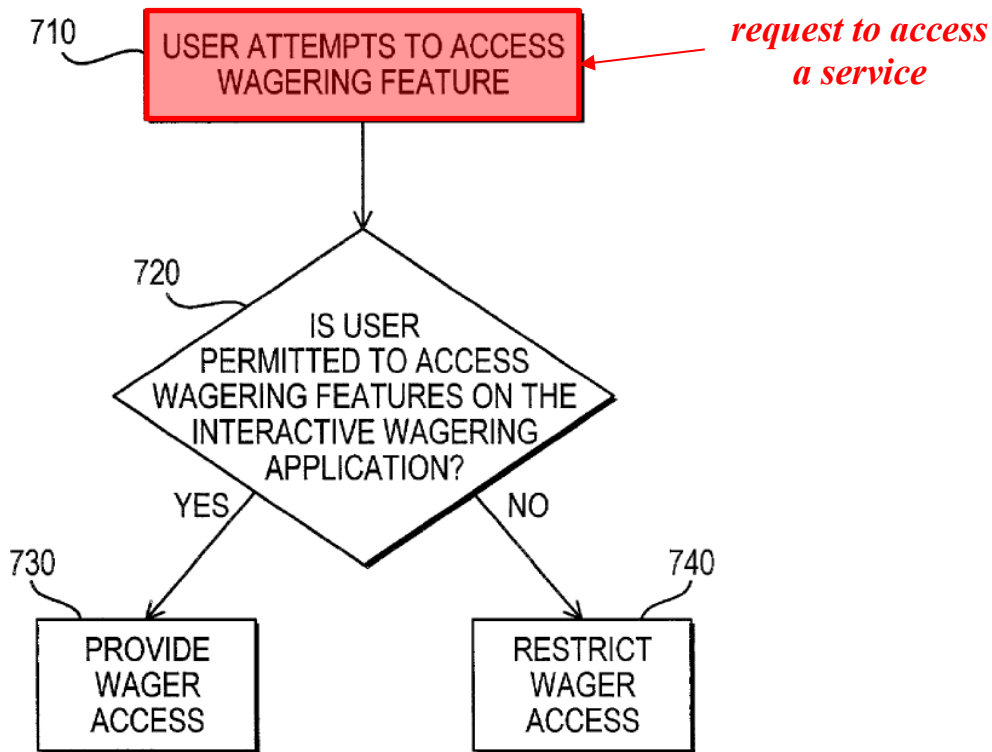


**FIG. 7**

**McNutt, Fig. 7 (annotated)**

**251.** As explained at limitation [1.4]-[1.7], the updating signal is sent from the mobile station to the GMLC 12, HLR 9, and LCS Client 8 (*special operating means*). In the combination, this updating signal would include the request to access a service because a user would desire to have access to all location-dependent services when they entered the area of interest and/or because providers of services may want to inform the user of available services when the user enters the area.

McNutt, Fig. 7 (step 710). McNutt further describes allowing or forbidding access to the service at steps 720-740. McNutt, Fig. 7.

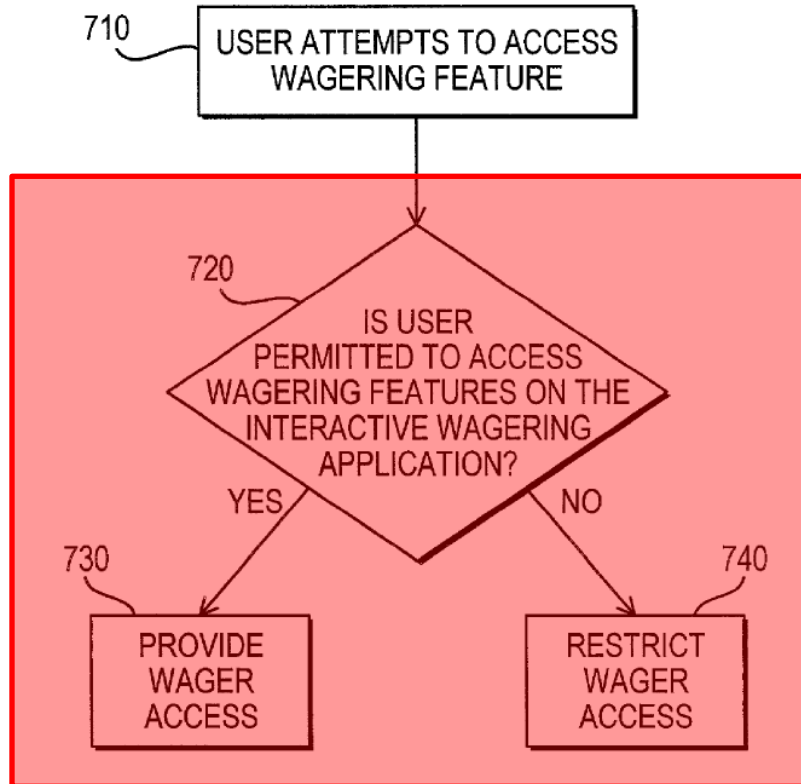


**FIG. 7**

**McNutt, Fig. 7 (annotated)**

## **XII. CONCLUSION**

**252.** I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code.

Dated: 9/9/25

  
\_\_\_\_\_  
R. Michael Buehrer, Ph.D.