IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

DEPARTMENT OF JUSTICE, Petitioner, v. ENVISIONIT, LLC, Patent Owner.	Case No. (Not Yet Assigned) In re *Inter Partes* Review of U.S. Patent No. 8,438,221

EXPERT REPORT OF RANDALL A. SNYDER

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I. INTRODUCTION

[1] My name is Randall A. Snyder. I have been retained by the Civil Division Department of Justice to provide expert analysis in the above-referenced matter concerning U.S. Patent No. 8,438,221 ("the '221 Patent") assigned to EnvisionIT, LLC. (Ex. 1001.)

II. PROFESSIONAL BACKGROUND AND QUALIFICATIONS

[2] I have over 30 years of experience in mobile telecommunications network and system architecture, engineering, design and technology.

[3] I consider myself to be an expert in the field of cellular and wireless telecommunications and networking technology per my qualifications described below. A true and correct copy of my *curriculum vitae* is attached as Ex. 1012, along with a list of cases where I served as a testifying or consulting expert.

A. Education

[4] I have a Bachelor's Degree in Mathematics from Franklin and Marshall College. More detail regarding my education may be found in my *curriculum vitae*. (Ex. 1012.)

B. Experience

[5] I have experience in the fields of both wireline and wireless telecommunications networking technology. I have taught many classes and seminars on both wireline and wireless telecommunication network technologies

and have been a panelist and speaker at numerous conferences at the Institute of Electrical and Electronics Engineers ("IEEE"), the Personal Communication Society ("PCS"), and the Cellular Telecommunications and Internet Association ("CTIA"). I spent seven years developing standards within the American National Standards Institute's subsidiary organization, the Telecommunications Industry Association ("TIA"), providing technical contributions and authoring and editing telecommunications proposed standards documents. Most notably, I authored and oversaw the standardization of Interim Standard 93, providing interconnection technology between wireline and wireless networks, which is a fully accredited national standard of the American National Standards Institute ("ANSI").

[6] I am the co-author of the McGraw-Hill books "Mobile Telecommunications Networking with IS-41," and "Wireless Telecommunications Networking with ANSI-41, 2nd edition" published in 1997 and 2001, respectively. Each of these books contains an extensive chapter on cellular text messaging technology. I have been issued 29 patents myself on telecommunications networking technology. I have been hired as a consultant by the CTIA, as well as by many wireline and wireless telecommunications companies, including Bell Laboratories, McCaw Cellular, AirTouch, AirTouch International, AT&T Wireless, AT&T Mobility, Lucent, Nokia, Ericsson, Motorola, Samsung, Siemens, Nextwave, MCI, Daewoo, Globalstar, T-Mobile, Sprint, U.S. Cellular, Teleglobe Canada, Teledesic

and other telecommunications technology vendors and service providers. I was also nominated in 2006 for a National Television Arts Emmy Award for Outstanding Achievement in Advanced Media Technology for unique wireless content distribution technology I designed while employed at Entriq, Inc.

[7] In addition, in 2002, I was co-founder of m-Qube, Inc., the first text message-based mobile marketing and carrier aggregation company in North America (now known as Mobile Messenger, Inc.). m-Qube established the technology and methodology for the use of text message based common short codes as well as text message marketing guidelines and rules now used globally.

[8] Moreover, I have been issued ten patents on SMS technology, including the invention of short code technology, and my books have been cited in four additional issued patents on SMS technology.

C. Publications

[9] Details of publications that I have authored or co-authored within at least the past 10 years are provided in the attached copy of my *curriculum vitae*. (Ex. 1012.)

D. Prior Testimony

[10] During the past ten years, I have been retained as a testifying or consulting expert in over 130 cases regarding cellular telecommunications technology, including 74 cases regarding cellular messaging technology. (Ex. 1012.)

E. Compensation

[11] I am being compensated at the rate of $500 per hour for my study, analysis and testimony in this case. I have no financial interest in the outcome of this case, nor do I have any financial interest in, or fiduciary relationship to the Department of Justice, its attorneys or the Patent Owners.

III. UNDERSTANDING OF PATENT LAW

[12] I understand that claims in U.S. patents may be deemed to be invalid under the laws and regulations governing patent practice. I have been asked to provide my opinions as to whether claim 19 of the ‘221 Patent is anticipated or would have been obvious to a person of ordinary skill in the art as of the pertinent date. I have been told that the pertinent date to apply in this matter is before February 13, 2004, the filing date of earliest application that gave rise to the ’221 Patent. Thus, the resulting pertinent date is on or before February 12, 2004.

A. Anticipation

[13] It is my understanding that under 35 U.S.C. § 102 a claim may be found to be “anticipated,” and therefore invalid, when a single prior art reference discloses each and every limitation of the claim.

[14] Determining whether a prior art reference discloses each and every limitation of a claim is a two-step analysis: (i) determining the meaning of the claim limitations; and (ii) comparing those limitations (according to their determined

meaning) with the prior art.

[15] The disclosure of a limitation in a prior art reference may be explicit or inherent. Explicit means that the limitation or feature is expressly described in the reference. Inherent means that the limitation or feature is necessarily present in the disclosure (*i.e.*, the feature is a deliberate or necessary consequence of the reference's disclosure) even if the reference does not expressly describe the feature. One of ordinary skill in the art must recognize that the feature is inherent to the disclosure, but inherency does not require that the person of ordinary skill in the art would have necessarily recognized the inherent disclosure at the time of the reference. Thus, a prior use of an invention that was accidental, unrecognized, or unappreciated can still be an invalidating anticipation.

[16] To anticipate, the reference must also enable a person of ordinary skill in the art to make and use the claimed invention. In other words, it must sufficiently describe the claimed invention to have placed the public in possession of it.

B. Obviousness

[17] It is my understanding that under 35 U.S.C. § 103, a claim may be found to be "obvious," and therefore invalid, when the differences between the claim and the prior art reference or references would have been obvious at the time the invention was filed to a person having ordinary skill in the art to which the patent pertains. I understand that in these proceedings, the facts in support of anticipation

or obviousness must be shown by a preponderance of the evidence.

[18] Obviousness is determined based on an analysis of four factors: (i) the scope and content of the prior art; (ii) the differences between the prior art and the claims at issue; (iii) the level of ordinary skill in the pertinent art; and (iv) secondary considerations of nonobviousness.

[19] The use of this four–factor test is designed to prevent the tendency of a later reviewer, in hindsight, to believe an invention was obvious.

[20] With respect to the first factor, the scope and content of the prior art includes references in the relevant art, and analogous arts.

[21] Determining the differences between the prior art and claims (as discussed above with regard to anticipation) is a two–step analysis: (i) determining the meaning of the claim elements; and (ii) comparing those terms with the prior art.

[22] The level of ordinary skill in the art is determined by analyzing such things as: (i) the prior art; (ii) the types of problems encountered in the art; (iii) the rapidity with which innovations are made; (iv) the sophistication of the technology involved; and (v) the educational background of those actively working in the field, as well as the inventors.

[23] Secondary considerations include evidence regarding the circumstances surrounding the inventive process including, but not limited to: (i) whether the claimed invention met a long–felt need; (ii) the inventors' success

despite the failure of others; (iii) commercial success; (iv) copying of the claimed invention by others; (v) praise and recognition for the invention; (vi) unexpected results; and (vii) significant effort and serendipity. I have been told that the burden of presenting evidence of secondary considerations is on the Patent Owner. I have not been presented with any evidence of secondary considerations relating to the ’221 Patent. (Ex. 1001.)

[24] It is my understanding that a claim is unpatentable under 35 U.S.C. § 103 if the claimed subject matter as a whole would have been obvious to a person of ordinary skill in the art at the time of the alleged invention. I also understand that an obviousness analysis takes into account the scope and content of the prior art, the differences between the claimed subject matter and the prior art, and the level of ordinary skill in the art at the time of the invention.

[25] In determining the scope and content of the prior art, it is my understanding that a reference is considered relevant prior art if it falls within the field of the inventor’s endeavor. In addition, a reference is prior art if it is reasonably pertinent to the particular problem with which the inventor was involved. A reference is reasonably pertinent if it logically would have commended itself to an inventor’s attention in considering his problem. If a reference relates to the same problem as the claimed invention, that supports use of the reference as prior art in an obviousness analysis.

[26] To assess the differences between prior art and the claimed subject matter, it is my understanding that 35 U.S.C. § 103 requires the claimed invention to be considered as a whole. This "as a whole" assessment involves showing that one of ordinary skill in the art at the time of invention, confronted by the same problems as the inventor and with no knowledge of the claimed invention, would have selected the elements from the prior art and combined them in the claimed manner.

[27] It is my further understanding that several rationales may be applied for combining references or modifying a reference to show obviousness of claimed subject matter. These rationales include: (i) combining prior art elements according to known methods to yield predictable results; (ii) simple substitution of one known element for another to obtain predictable results; (iii) a predictable use of prior art elements according to their established functions; (iv) applying a known technique to a known device (method or product) ready for improvement to yield predictable results; (v) choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; and (vi) some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify a prior art reference or to combine prior art teachings to arrive at the claimed invention.

IV. PERSON OF ORDINARY SKILL IN THE ART

[28] It is my opinion that a person of ordinary skill in the art relevant to the

subject matter of the '221 Patent (Ex. 1001) at the time of the invention would have a computer science, engineering, physics, mathematics or other technical degree at the undergraduate level. In addition, I would expect this individual to have at least three to five years of practical cellular network and protocol design and software development experience, along with an understanding of cellular network architecture, standardized protocol specifications and text messaging technologies, all of which was very-well understood by the early 1990s. I am a person of at least ordinary skill in the art and was so at the time of the purported invention, *i.e.*, on or before February 12, 2004.

V. MATERIALS CONSIDERED

[29] My opinions herein are based on my personal knowledge and experience with cellular telecommunications, my knowledge of the methods by which inventions are patented in the U.S. and a review of various materials, as discussed below.

VI. LIST OF EXHIBITS

[30] The following table is a list exhibits considered and cited within this report:

Exhibit	Description
Ex. 1001	U.S. Patent No. 8,438,221
Ex. 1009	File History (excerpts) for U.S. Patent No. 8,438,221
Ex. 1012	CV of Randall Snyder
Ex. 1013	Gundlegård Thesis

Exhibit	Description
Ex. 1014	U.S. Patent Application Publ. No. 2002/0184346 A1 to Mani
Ex. 1015	U.S. Patent Application Publ. No. 2002/0188725 A1 to Mani
Ex. 1016	REPORT AND ORDER AND FURTER NOTICE OF PROPOSED RULE MAKING (FCC Report No. 94-288) ("FCC Report")
Ex. 1017	U.S. Patent Application Publ. No. 2002/0103892 A1 to Rieger
Ex. 1018	U.S. Patent No. 6,816,878 to Zimmers
Ex. 1019	3GPP Standard (4.2.0)
Ex. 1020	R. Sandhu et al., "Access Control: Principles and Practice," IEEE Communications Magazine September 1994, Vol. 32 No. 9, pp. 40-48.
Ex. 1022	Excerpts from Christensen et al., "Wireless Intelligent Networking" Artech House, Inc., 2001
Ex. 1023	E112 - Wireless Emergency Services Whitepaper, CMG Wireless Data Solutions, November 2001
Ex. 1024	Report of the Ministry of Interior, Finland "Information to the Public – Warning and Alarm System" 2000
Ex. 1025	Wood, M. "Disaster Communications" APCO Institute, Inc., June 1996
Ex. 1026	Excerpts from UNIX System V, RELEASE 4, User's Guide, UNIX System Laboratories, Inc., Prentice-Hall, Inc. 1990
Ex. 1027	U.S. Patent No. 6,112,075 Weiser
Ex. 1028	3GPP Website Portal – First Release Cell Broadcast Standard

VII. BACKGROUND

A. Telecommunications Standards

[31] Standards for the design and function of telecommunications equipment are no different in goal and purpose from those for any other type of technical standard. Telecommunications standards are prescribed for the design and

function of equipment as simple as a telephone keypad to the design and function of the complex and sophisticated computer equipment and services provided by a wireless telecommunications network.

[32] In tangible terms, a telecommunications standard is simply a document that establishes engineering and technical requirements for processes, procedures and methods that have been decreed by authority or adopted by consensus. The primary goal of the telecommunications standards process is to encourage the interconnectivity of telecommunications equipment and services by establishing and promoting technical recommendations in these areas. The telecommunications industry achieves this goal by creating and maintaining voluntary specifications that can optimize equipment compatibility. Standards are typically considered to be *recommendations*; *i.e.*, they are prescribed as purely voluntary. However, business needs usually show that it may not be very lucrative to stray from standardized designs and functions.

[33] Standards encompass many areas of engineering and technical requirements. They can be very brief and promote an existing engineering solution to a new problem (usually by reference), or they can be quite extensive (hundreds to thousands of pages) and establish the details for the processes and methods for developing an entire system. The primary goal of telecommunications standards is to establish and promote technical recommendations that enable the

interconnectivity of equipment and services. However, standards do not dictate an *implementation* or the methods for developing an individual solution to provide an equipment or service. Thus, business competition among manufacturers is preserved while enabling interoperation of their equipment and services.

[34] Telecommunications standards can include many aspects of the design and function of equipment. They include network reference models used for developing network architectures; descriptions of functions as perceived by an end-user and as provided within and between networks; descriptions of protocols or the methods of communication within and between functional and network entities; testing procedures for establishing equipment compatibility and standards compliance; and any procedures that assist in achieving the goals of the standardization process.

B. Communications Protocols

[35] A communications protocol is a specialized set of rules that govern the communications of a system. A computerized communications protocol is generally defined by the following three criteria:

1. Syntax, *i.e.*, how to construct the information.
2. Semantics, *i.e.*, what the information means.
3. Procedures, *i.e.*, what to do with the information.

[36] The protocol enables the effective use of the information to provide

meaningful communications within a network. Protocols have become complex, especially when used to govern telecommunications and the sophisticated services they provide. These advanced protocols provide for the transmission of information among network entities that enables intelligence to be distributed throughout the network. Standardized specifications are often developed to prescribe the precise structure of the elements that comprise the information to be transmitted from one network function to another network function.

[37] For communications protocols to operate properly, the syntax of the transmitted information is *verified* at the receiving end of the transmission. This means that the prescribed structure of each information element is checked for correctness according to the standardized specification. For example, in message based communications protocols, the entire message structure, along with each and every included parameter, is checked for errors in format, length, type, order and other syntactical characteristics. If an error is discovered, the message may be rejected and a failure indication is sent back to the source of the transmission.

[38] Similarly, the semantics of the transmitted information is *validated* at the receiving end of the transmission. This means that the prescribed values each information element can assume are checked for correctness according to the standardized specification. Again, if an error is discovered, the message may be rejected and a failure indication is sent back to the source of the transmission.

C. The Cell Broadcast Services ("CBS") Standard Protocol

[39] Cell broadcast is a cellular telecommunications network service enabling the network to transmit a number of unacknowledged short messages to all cellular telephones within a defined geographical area. It is a one-way transmission broadcast that enables a short textual communication to be received by any capable cellular device that is (or can be) tuned to the cell broadcast channel.

[40] Cell broadcast messaging technology was originally documented in the worldwide cellular network system standardized as the Global System for Mobile ("GSM") communications in 1989 and is also known as Short Message Service – Cell Broadcast ("SMS-CB"). As GSM technology standards evolved, the committees authorized to issue the standard specifications decided to change the name of the overall technology to the more comprehensive Universal Mobile Telecommunications System ("UMTS"). UMTS was simply the next incarnation of cellular technology, wholly based on GSM, and became the basis for what's more commonly known as "3G" or third-generation services technology. Today, the latest incarnation of this standardized technology is known "LTE" for Long Term Evolution or "4G" services technology.

[41] As cell broadcast is a "cellular" technology, a geographic area must be interpreted as one or more radio "cell" areas. A cell is simply an individual geographic area that is the topological component of a cellular network. The cell

area is defined by the radio coverage of the equipment located at the cell site. In a particular cellular network, cells are identified by unique identification numbers on a per-network basis. A cell broadcast area can be one or more cell areas (denoted as one or more cell ID numbers) or can be the entire cellular network of a particular operator (denoted as *all* cell ID numbers). The entire cellular network coverage area of a particular operator is generically known as the public land mobile network ("PLMN"). A cell broadcast message can be transmitted to a particular geographic area within a particular network, defined by the PLMN ID along with a list of cell IDs, at a specified periodic rate, for a specified period of time and for a specified number of times.

[42] In addition, short messages can be broadcast to a "location area" in GSM and to a "service area" in UMTS. A location area is simply a predefined group of cells that a particular network operator uses to define a particular market coverage area within its network. A service area serves the same purpose in UMTS networks.

D. Cell Broadcast Services ("CBS") Standard Reference Model

[43] The GSM standardized specification depicts the network reference model to be used by designers and developers to implement the cell broadcast function (Fig. 1 below). (Ex. 1019, at 8.)

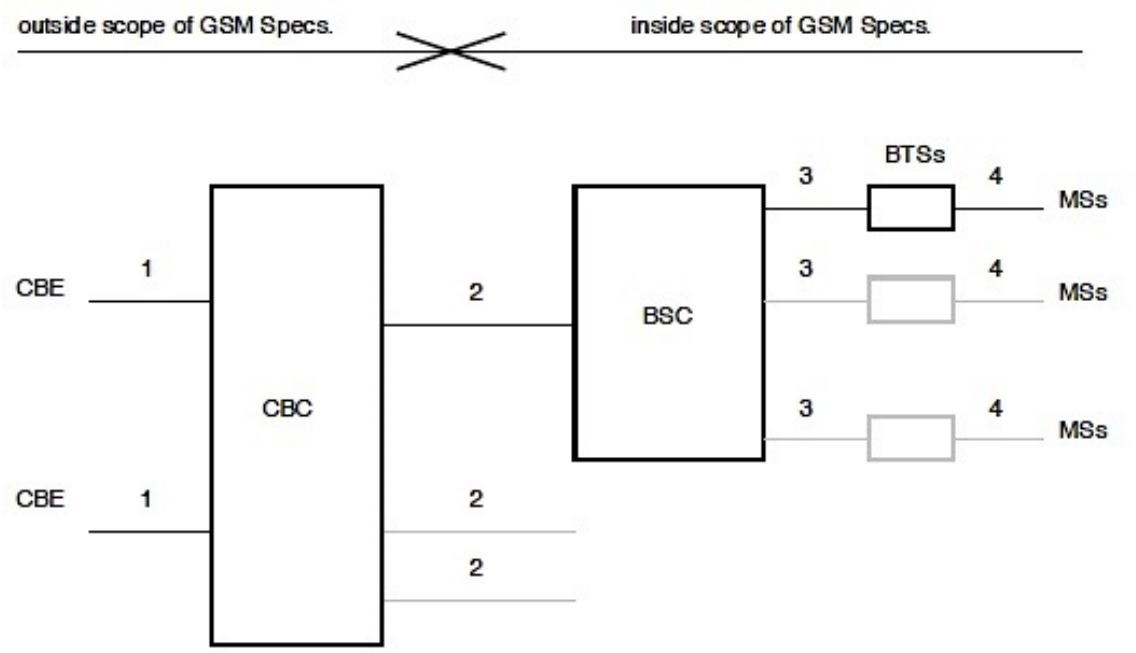


Figure 1

[44] This network reference model is designated as an "architecture" in the standard but this is a misnomer. As described above, the reference model is used to design and develop the actual physical architecture of the network by defining the procedures and protocols enabling communications among the network functional entities via the identified interfaces. In a standard, the reference model only prescribes the logical functions and the required means of communicating among those functions; it does not prescribe a physical implementation, where functions can reside, business implications of a particular architecture, division of responsibilities among involved functional entities or other implementation-dependent considerations. A true network architecture would certainly consider these aspects to properly implement and deploy such a system in the real world, but

that is beyond the scope of a standard.

[45] The functional entities for the procedures and protocols for cell broadcast are well defined within the Third Generation Partnership Project ("3GPP") Standard. (Ex. 1019.) 3GPP is the international standards making body responsible for the GSM-based cellular system specifications. The cell broadcast service entities include the Cell Broadcast Center ("CBC"), the Base Station Controller ("BSC"), the Base Transceiver Station ("BTS") and the Mobile Station ("MS") also known as the cellular telephone. Outside the scope of the standard specification is the Cell Broadcast Entity ("CBE"). This is because the CBE represents any type or number of applications containing service logic that can transfer messages to the standardized CBC for subsequent broadcast to cellular telephones within the specified cell coverage areas. The standard specifications prescribe the way in which technology is used; however, to spur innovation and market competition, the standards do not prescribe what the technology is used for. However, because the standards prescribe the required message content, geographic area and associated message control parameters, these required data must be provided to the standardized functional entities so that the broadcast messaging service can operate properly. Providing these data to the standardized procedures would be the minimum requirements of a CBE and would be obvious to a person of ordinary skill in the art. Thus, the CBE functional entity is considered to be external to the standardized core

cellular network, but supports some obvious and known capabilities. The CBE is only really defined as a functional entity that acts as the originator of a cell broadcast message.

[46] The CBC is the heart of the cell broadcast messaging system. The CBC is essentially a store-and-forward message repository. The CBE logical application originates a message with certain text content, specifies a certain geographic area and specifies control information describing when and how often to broadcast the message. The CBC receives the broadcast message, stores the message and forwards the message to a specified geographic area, represented by a cellular coverage area. It also forwards the message to be broadcast at a time and repetition interval according to the control parameters received from the CBE.

[47] The 3GPP Standard clearly requires that a cell broadcast service use message content of a certain type, length and format. It also requires that the service use a geographic area and control parameters of a certain type, length and format. (Ex. 1019, at 15.)

[48] A cellular network has no inherent knowledge of geographic context; rather, a cellular network only has knowledge of its own identity and its own associated cell identities. Thus, a specified geographic area must be converted to the corresponding cell coverage areas required by the cell broadcast service. This is so the message can be transmitted to cell phones in a *meaningful* geographic area

represented by specified cell coverage areas. A person of ordinary skill in the art would certainly understand this basic correspondence of descriptive geographic context, such as a city or county, to the list of cell identities that overlay that city or county. And, a person of ordinary skill in the art would understand that this required data translation could be performed at either the CBE or CBC.

[49] Furthermore, a person of ordinary skill in the art would certainly understand that proper design and implementation of a cellular network communications protocol in software requires functions to both verify the syntax and validate the semantics of the data sent across a communications interface.

VIII. STATE OF THE ART AT THE TIME OF THE PATENT

A. Cell Broadcast Standards, Services and Applications

[50] The technology describing cell broadcast transmission services using a broadcast text message was originally published in version 3.0.0 of the international GSM standard specifications in 1989. (Ex. 1028.) This specification evolved into version 4.2.0 and was uploaded for public dissemination to the 3GPP standards organization website on January 11, 2002 (Fig. 2 below).

[51] The technological concepts required to design and develop an application using the standard cell broadcast messaging service were recognized and well-known at the time of the ‘221 Patent. Example applications included emergency alerts, traffic information, weather information and news.

[52] These well-understood concepts include the procedures, messages, parameters and interfaces required for cell broadcast messaging technology; mapping named geographic areas such as towns, cities, counties, states, etc. to corresponding cell site IDs representing cellular coverage areas; verifying and validating cellular communications protocol information elements transmitted over an interface; recording of system behavior including messages transmitted over an interface for auditing, billing and other purposes; permission-based access control functions defining and limiting the activities an application user can perform; and the ability to broadcast messages for distribution to multiple and disparate network types.

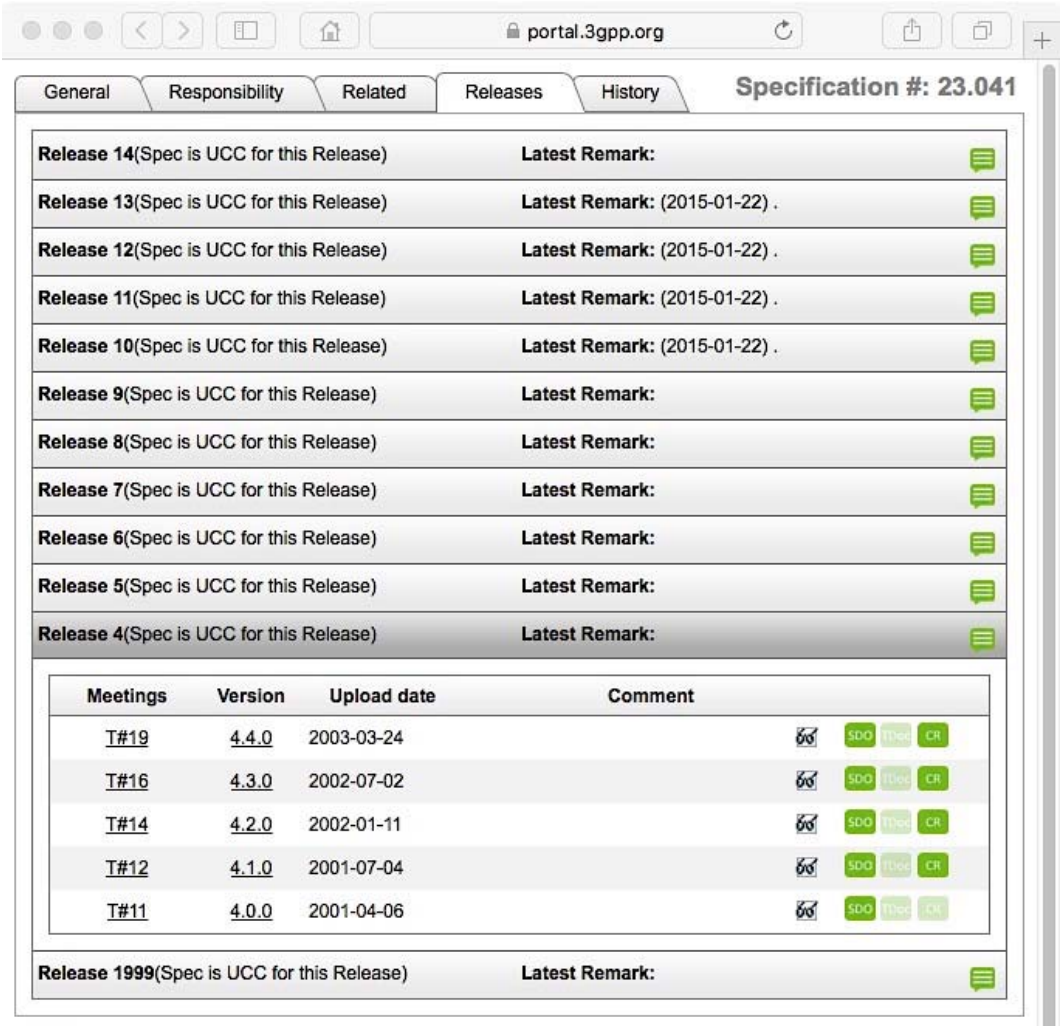


Figure 2

[53] The 3GPP Standard details the underlying technology required to implement a cell broadcast messaging application. This standard describes and depicts several example applications of the technology including news, sports, weather, finance, etc. (Fig. 3 below). (Ex. 1019, at 34.)

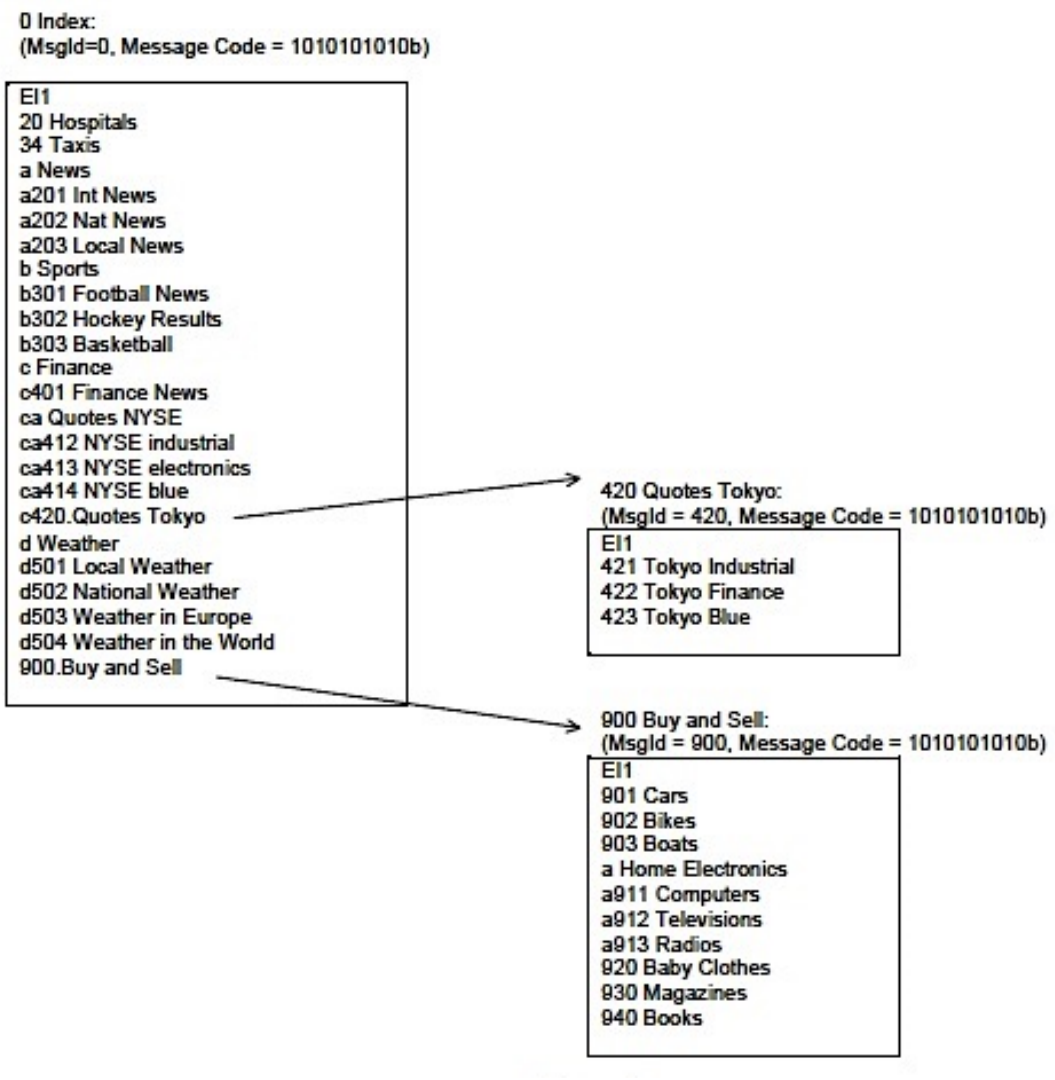


Figure 3

[54] In 2000, the Ministry of the Interior of Finland published a report describing and depicting how cell broadcast messaging technology could be used for a public warning and alarm system. (Ex. 1024, at 21-32.) This report describes a CBE application for such a warning system using the CBC and based on the 3GPP Standard (Ex. 1019).

[55] In addition, the concept of a national Emergency Broadcast System

("EBS") was well-known at the time of the '221 Patent. In fact, in 1994 the Federal Communications Commission ("FCC") released a report and notice of proposed rule making ("FCC Report") that describes modernizing the current (at the time) EBS. This report describes the application for a non-commercial broadcast messaging alert system utilizing multiple networks to transport alerts over various technologies including satellite networks, landline and cellular telecommunications networks, cable TV networks and others. (Ex. 1016.)

[56] Furthermore, in 1996, the book "Disaster Communications" was published in the United Kingdom by one of the named inventors of the '221 Patent, Mark Andrew Wood. (Ex. 1025.)

[57] This book describes, in some detail, various technological aspects of the emergency applications and broadcast communications required for comprehensive disaster communications. The communications technologies addressed include satellite, terrestrial radio, landline telecommunications and cellular telecommunications. The book, according to the author, "…presents a practical guide to implementing basic communications facilities." (Ex. 1025, Foreword.)

B. Protocol Messaging, Parameters, Verification and Validation

[58] The 3GPP Standard defines the detailed communications protocol for a cell broadcast message structure including parameters that uniquely identify a cell

broadcast message to be sent from the CBC to a specified geographic area, denoted as a list of cell identifiers (Fig. 4 below). (Ex. 1019, at 15.) Again, this standard was well understood at the time of the '221 Patent. A logical cell broadcast messaging application (*e.g.*, a CBE) would need to originate, assign and otherwise process the data required for most of the parameters in the broadcast message defined for the interface between the CBC and the BSC.

[59] The detailed protocol message structure requires, for example, an originating message identifier, cell-list area, message repetition period, number of times to broadcast the message and the precise message text. As a standardized communications protocol, these parameters, as well as the overall message, are required to be in a well-defined and precise format for proper processing by the network entities involved in the communication.

PARAMETER	REFERENCE	PRESENCE
Message-Identifier	9.3.1	M
Old-Serial-Number	9.3.2	O
New-Serial-Number	9.3.3	M
Cell-List	9.3.5.1	M
GSM only [Channel Indicator	9.3.6	O]
Category	9.3.7	O
Repetition-Period	9.3.8	M
No-of-Broadcasts-Requested	9.3.9	M
Number-of-Pages	9.3.4	M
Data Coding Scheme	9.3.18	M
CBS-Message-Information-Page 1	9.3.19	M
CBS-Message-Information-Length 1	9.3.20	M
CBS-Message-Information-Page 2	9.3.19	O
CBS-Message-Information-Length 2	9.3.20	O
:		:
CBS-Message-Information-Page n	9.3.19	O
CBS-Message-Information-Length n	9.3.20	O

Figure 4

[60] Furthermore, it was certainly understood at the time of the ‘221 Patent that implementing a standard telecommunications protocol in software requires functions to both verify the syntax and validate the semantics of the broadcast message and parameters, as defined above. The 3GPP Standard provides a list of error causes when verifying and validating the cell broadcast message data sent across the interface between the CBC and BSC. A person of ordinary skill in the art would understand that many of these error codes would also apply to verification and validation of data passed across the interface between the CBE and CBC (Fig. 5 below). (Ex. 1019, at 25.)

Cause	Reason
Parameter-not-recognized	Sent when the recipient (CBC or BSC/RNC) was unable to act upon the primitive received due to an unrecognized parameter. A primitive should not be rejected only because a parameter is not recognized as this would prevent extensions to the service
parameter-value-invalid	Sent when a failure occurred due to the value of a parameter being invalid, e.g. out of range, or in Write-Replace, the parameter "no of pages" does not equal the number of pages received
valid-CBS-message-not- identified	Sent when the BSC/RNC does not recognize the CBS message reference
cell-identity-not-valid	Sent when the BSC/RNC does not recognize a cell Identity
unrecognized-primitive	Sent when the BSC/RNC did not recognize the primitive at all
missing-mandatory-element	Sent when a mandatory element is missing from the primitive
bss-capacity-exceeded	Sent when a write-replace fails because the BSC/RNC cannot meet the requested repetition period or when the set-drx parameters cannot be applied because of the cell loading
GSM only [cell-memory-exceeded	Sent when the local cell memory has been exceeded]
bss-memory-exceeded	Sent when the BSS/RNS is unable to store a CBS message as the BSS/RNS memory has been exceeded
cell-broadcast-not-supported	Sent when the CBCH/CBS related Radio Resource is not configured for a cell
cell-broadcast-not-operational	Sent when the CBCH/CBS related radio resource is not available because of error conditions or due to maintenance activities
incompatible-DRX-parameter	Sent when the DRX parameter(s) cannot be applied.
GSM only [Extended-channel-not-supported	Sent when a write-replace fails because the extended channel is not configured for a cell]
message-reference already-used	Sent when the recipient (BSC/RNC) was unable to act upon the write_replace received due to a previous write_replace received with the same message_reference.
unspecified-error	Sent when none of the above cause values apply

Figure 5

C. Recording and Logging of Communications and Data

[61] At the time of the ‘221 Patent, it was very well understood that real-time telecommunications applications would be implemented with comprehensive functions to record and log the details of transmissions sent from or received by the application. This is because recorded logs provide the necessary documentation required for competent commercial operations, such as billing, accounting, auditing, marketing, engineering and other reasons.

[62] The recorded logs enable proper billing, invoicing, auditing and the means to resolve financial disputes or anomalies that may occur after the application is used. They also enable competent cost-based pricing of the application as logs provide insight into its use. Metrics based on the usage logs are typically required for marketing and engineering. The ability to tout traffic volume and type measurements is very valuable to marketing organizations. And, development groups tasked with reliability, performance, capacity and planned growth of the application require various metrics to properly engineer the application and quickly respond to bugs and failures. Since these message delivery systems are designed to be highly reliable, they are over-engineered to handle unanticipated peak traffic loads without failing.

[63] An example of these well-known capabilities is provided in a master's program thesis from a student who attended the Linköping University in Sweden. Commercial business models are necessarily dependent on the ability to record and log transmission behavior. And, the ability to record and log application activities had been implemented at the time of the '221 Patent. Regarding one business case, "The billing for this business case should not be so complex. For example in CMGs Cell Broadcast system actions are logged for every CBE and this information should be possible to combine with a price list…" (Ex. 1013, at 20.)

D. Cell Broadcast Geographic Area

[64] The 3GPP Standard defines a broadcast geographic area as a list of cell identifiers. (Ex. 1019, at 15, 21.) It was very well-known at the time of the '221 Patent, that to use location information based on cellular network technology, descriptive and meaningful geographic data would need to be correlated to cellular coverage areas designated by cell identifiers. Note that the cell-list parameter in the standard does not only include the particular list of cell IDs from where a message is broadcast; the cell-list can also include the standardized parameters used to identify the entire network (*i.e.*, PLMN) and the location area (*i.e.*, a defined group of cells representing a market area of the PLMN).

[65] At the time of the '221 Patent, the problem of associating a descriptive geographic area with cellular coverage areas was recognized and solutions documented. U.S. Patent No. 6,112,075 ("Weiser") was issued in 2000 (Ex. 1027), and teaches a method of communicating emergency warnings to radio receivers over a cellular network that are able to receive those warnings within a selected geographic area. Weiser provides multiple examples of emergency applications requiring such warnings, such as severe weather, nuclear site problems and toxic waste problems. The specification describes one embodiment of the invention whereby "…the appropriate signal transmission stations to reach the geographic area are identified. This can be done with a manual or automated look-up table, or

geographically on a map, or otherwise."

[66] At the time of the '221 Patent, the concept of an automatic location information ("ALI") database to determine the source location of a cellular caller had already been widely deployed in the U.S. The source location was based on the cell identification of the caller for inbound emergency 9-1-1 calls. "The ALI database containing a cross-reference of cell/sector data to descriptive data such as street address, landmark, or any other identifying information, returns a response… …that contains a description of the caller's location." (Ex. 1022, at 264.)

[67] Additionally, it was well-known at the time of the '221 Patent that to create a user-friendly location-based application using cellular technology, there must be a database (*i.e.*, a lookup table) to associate descriptive geographic areas such as cities, counties, etc. to corresponding cell site identifiers representing those cellular coverage areas. An application developed by CMG Wireless Data Solutions in 2001 that handles emergency 1-1-2 cellular calls within Europe depicts such a lookup table (Fig. 6 below). (Ex. 1023, at 3.)

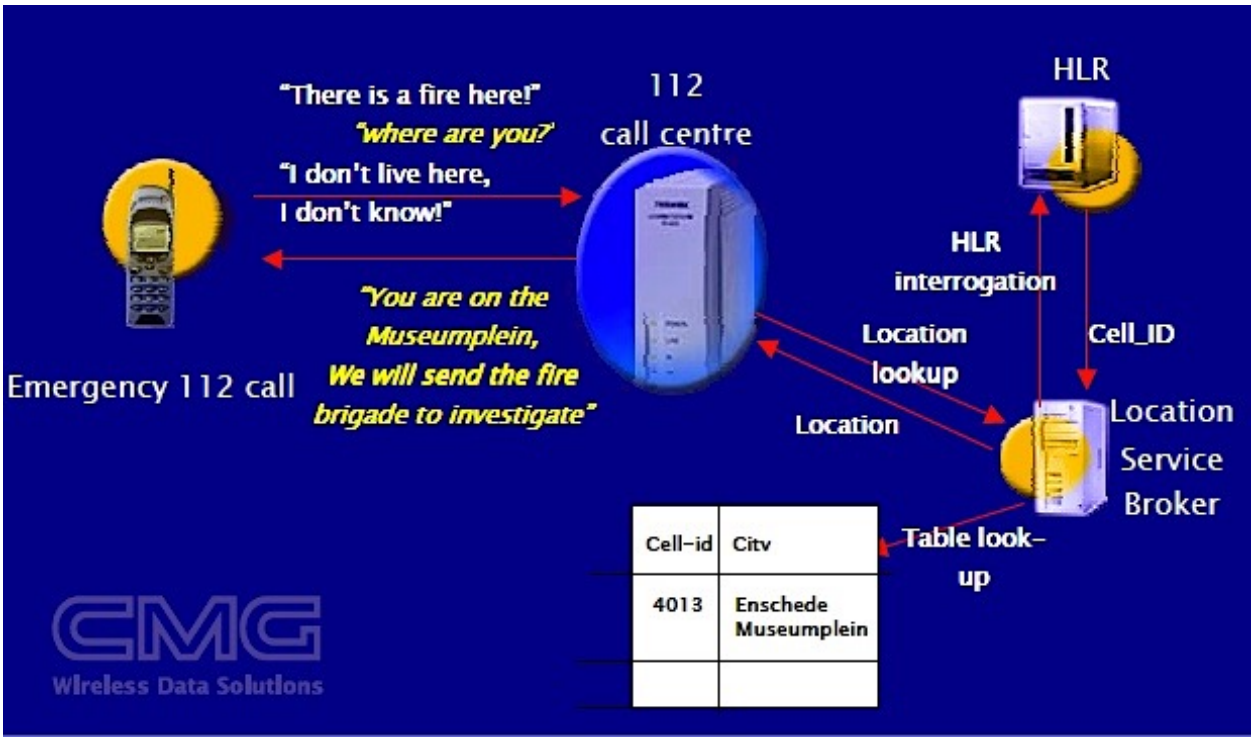


Figure 6

[68] The Ministry of the Interior of Finland report from 2000 states, "The CBC holds the relevant information on network topology and geographical location of each base station (in ETSI terminology: Base Transceiver Station, BTS). The operator manages the CBC, and ensures that it is kept up to date with any changes of BTS location in the actual network." This report from 2000 that describes one method to associate descriptive geographic data with cellular network data representing cell coverage areas was known at the time of the '221 Patent (Fig. 7 below). (Ex. 1024, at 26.)

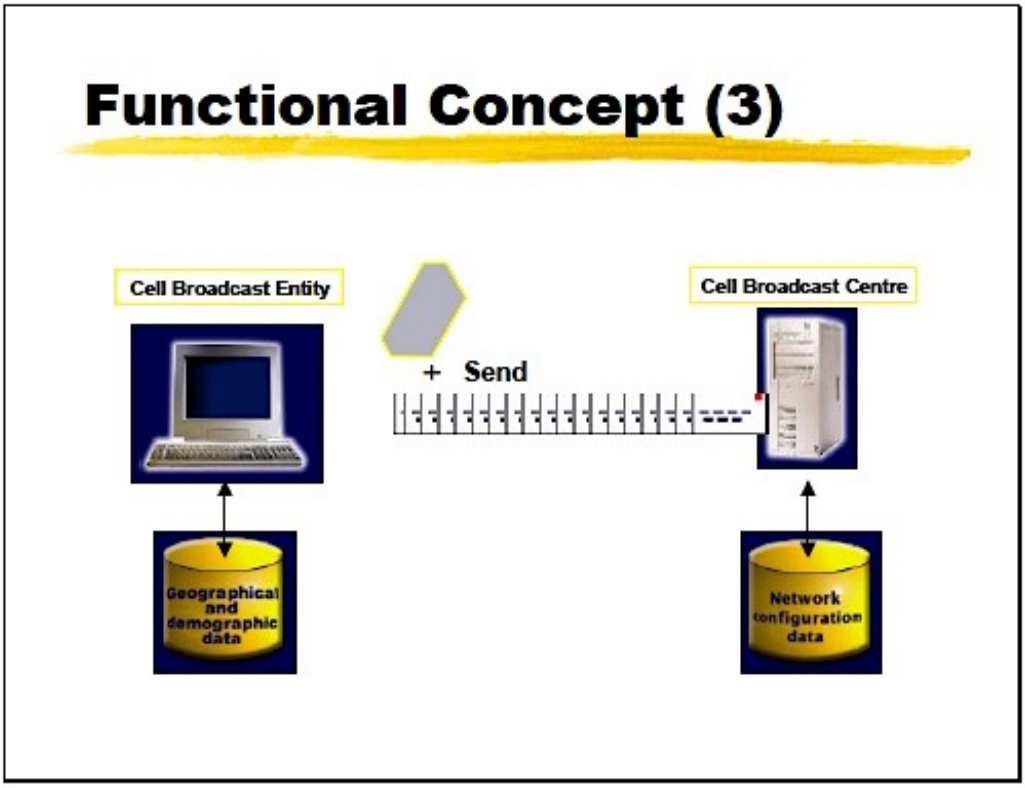


Figure 7

E. System Access Control, User Roles and Permissions

[69] At the time of the '221 Patent, the concept of permission-based access to a computer system, application or particular function within an application was very well-known. The principles and techniques of access control, *i.e.*, determining what users are authorized to do based on who they are, was a well-known security technique at least as far back as 1990. The UNIX operating system, developed in the 1970's, was commonly known to support permission-based access to individual files

and directories.

[70] Access privileges can be modified for individual users and user groups designated by username or group name by executing the "change mode" command. Users and user groups can be granted or denied permission to engage in particular types of access to files such as being authorized to read a file, write to a file, execute a file (if the file is a program), any combination of these or be denied access to a file (Fig. 8 below). (Ex. 1026, at 3-52.)

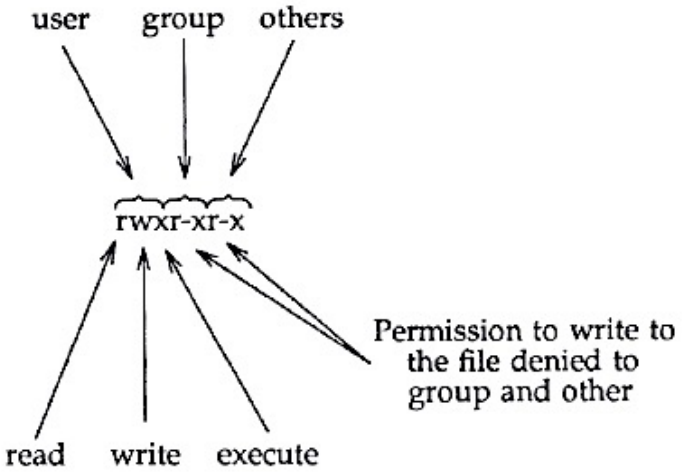


Figure 8

[71] Access control procedures preventing activity that could lead to a security breach were comprehensively described and documented in an IEEE Communications Magazine article in 1994. "Access control constrains what a user can do directly, as well as what programs executing on behalf of the users are allowed to do." (Ex. 1020, at 40.) Users of a computer system are first authenticated (*e.g.*, by logging in with a username and password) and then checked against an

authorization database controlling the type of access, if any, to be granted (Fig. 9 below). (Ex. 1020, at 41.) A person of ordinary skill in the art at the time of the invention would know how to design and develop such a permission-based access control function like the one depicted.

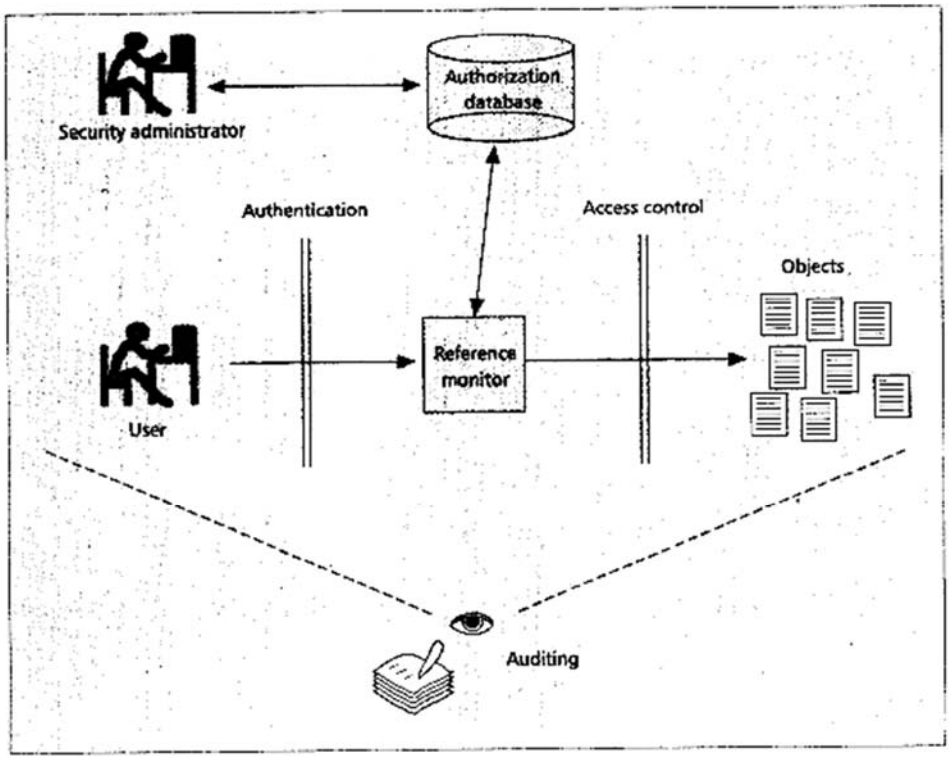


Figure 9

IX. SUMMARY OF OPINIONS

[72] It is my opinion that the '221 Patent teaches the functions of a CBE application entity based on the GSM cell broadcast service and these functions were already well-known at the time of the invention.

[73] Furthermore, as described in detail below, it is my opinion that claim 19 of the '221 Patent is invalid in view of prior art under 35 U.S.C. § 103.

[74] My opinions are based on my education, knowledge, experience, expertise, training and analysis of the materials cited above.

[75] I hereby reserve the right to supplement or modify my opinions detailed in this report to the extent that (1) terms in the claims of the '221 Patent may be further clarified by the court, (2) terms not previously formally construed by the court are given a construction that was not anticipated by my analysis or is somehow inconsistent with my analysis, (3) new prior art comes to light through discovery or other means, or (4) I learn that the Patent Owners are interpreting the claims in a way that is inconsistent with how a person of ordinary skill in the art would interpret the claims.

X. U.S. PATENT NO. 8,438,221

[76] I am not a lawyer. However, the legal principles used to construe claims have been explained to me. I have used those standards in formulating my opinions, set forth herein. My understanding of those standards is as described below.

[77] I have been asked to review the proposed construction of the term "broadcast" as used in the asserted claims of the '221 Patent and offer my opinion regarding whether a person of ordinary skill in the art would agree with the subject construction. I understand that in this proceeding, claim terms are interpreted in accordance with their broadest reasonable construction consistent with the patent specification. I have been informed that the process of construing a claim term

begins with the words of the claims; however, I also understand that the claims must be read in view of the specification, of which they are a part. I also understand that the claims should be construed in view of the prosecution history that took place at the patent office. I also have been informed that while the Courts and this Board are permitted to consider extrinsic evidence, like expert testimony, dictionaries, treatises and relevant prior art, such evidence is generally of less significance than the intrinsic record. Also, I understand that extrinsic evidence may not be used to contradict claim meaning that is unambiguous in light of the intrinsic evidence (*i.e.*, the claim language, the specification, and the prosecution history).

[78] I have reviewed the proposed construction of the term "broadcast" as used in the asserted claims of the '221 Patent, namely, "to transmit data for purposes of wide dissemination over a communications network including, but not limited to, cellular carriers, digital private radio systems, private radio systems, internet, wireline telecommunications, satellite, and CATV systems." It is my opinion that a person of ordinary skill in the art would agree with that construction, and I have applied it in comparing the claims of the '221 Patent to the prior art and in presenting my analysis and opinions in this matter.

[79] All other terms in the claims are interpreted according to their plain and ordinary meaning.

XI. THE ASSERTED CLAIMS OF THE '221 PATENT ARE INVALID AS BEING OBVIOUS OVER THE PRIOR ART

A. Description of the Patent

[80] The '221 Patent is purportedly directed to the field of "admission control for broadcast messaging." (Ex. 1001, at Col 1:17-20.)

[81] The specification describes the "invention" as:

> "…a message alert broadcast broker system for providing a broadcast message to a plurality of user devices located within a geographically defined broadcast target area, the system including a broadcast service bureau communicatively coupled for receiving from one of a plurality of coupled broadcast agent access systems providing a broadcast request from an originating broadcast agent associated one broadcast agent message origination systems. The received broadcast request includes a broadcast agent identification, the geographically defined broadcast target area, and a broadcast message, the broadcast service bureau configured for verifying the broadcast request as a function of the broadcast agent identification including an authority of the originating broadcast agent to send the broadcast message to the broadcast target area. The broadcast service bureau processing the verified broadcast request for transmission to one or more broadcast message networks providing broadcast message alerting service to at least a portion of the broadcast target area."

[82] The '221 Patent first observes that, "Additionally, as discussed SMS messaging is not location based and does not send messages to intended recipients located within a defined geographic location. Since many telecommunication users will be messages [*sic*] independent of their location, many of the generated SMS messages are sent to users who are not in the intended area." (Ex. 1001, at Col. 1:59-64.)

[83] The '221 patent describes its inventive method as "…a short text message is sent over the location broadcast channel. A mobile unit or Broadcast Agent phone, which is configured to receive location-based broadcast messages, while in the idle mode and located in the predefined cell, receives the broadcast message and displays the message on its screen." (Ex. 1001, at Col. 5:44-49.) Furthermore, the "The public service message location broadcast system and methods described herein provide the functions and steps necessary to ensure that the Broadcast Agents are authorized to send the requested broadcast messages to the defined broadcast target area." (Ex. 1001, at Col. 6:35-40.)

[84] Contrary to the specification, appropriate solutions to these problems existed at the time of the '221 Patent.

B. Introduction to the 3GPP Standard

[85] In this report, I have relied on a version of the standard numbered V4.2.0, which was published on or before January 11, 2002 ("3GPP Standard"). A screen shot of a library page from the 3GPP international standards portal is shown in Fig. 2 above. This screen shot clearly shows that this publication was uploaded and available on the internet as of January 11, 2002. On its face the document shows a release date of December 2001. (Ex. 1019.) This web page is accessible at: https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=748.

C. Introduction to Gundlegård

[86] In this report, I have relied on a master's program thesis from a student who attended the Linköping University in Sweden ("Gundlegård"). On its face the document lists a publication date of May 8, 2003. (Ex. 1013.)

D. Introduction to Mani

[87] In this report, I have relied on U.S. Patent Application No. 2002/0184346 A1. This patent application was published on December 5, 2002. (Ex. 1014.) I have further relied on U.S. Patent Application No. 2002/0188725 A1. This patent application was published on December 12, 2002 ("Mani"). (Ex. 1015.) I have been told that the content of Ex.1015 has been incorporated by reference into Ex. 1014, and is thus effectively part of the host document Ex. 1014 as if it were explicitly contained therein.

E. Introduction to Zimmers

[88] In this report, I have relied on U.S. Patent No. 6,816,878 ("Zimmers"). This patent issued on November 9, 2004, based on an application that was filed on February 11, 2000. I have been told that the filing date of February 11, 2000 legally makes this document a prior art reference, despite its issue date coming after the pertinent date of February 12, 2004 in this matter. (Ex. 1018.)

F. Introduction to Sandhu

[89] In this report, I have relied on an article titled, "Access Control:

Principles and Practice" by Ravi S. Sandhu and Pierangela Samarati ("Sandhu") published in IEEE Communications Magazine on September 1994. (Ex. 1020.)

G. Introduction to Rieger

[90] In this report, I have relied on U.S. Patent Application No. US 2002/0103892 A1 ("Rieger"). This patent application was published on August 1, 2002. (Ex. 1017.)

XII. § 103 OBVIOUSNESS PRIOR ART ANALYSIS

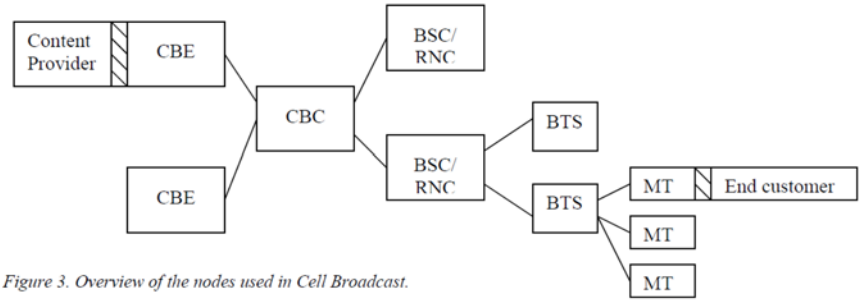
[91] The following sections describe how various prior art references in combination render obvious the claims at issue for the '221 patent. A person of ordinary skill in the art would be motivated to combine these references for the reasons given in part **XIII** below.

A. Gundlegård in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers

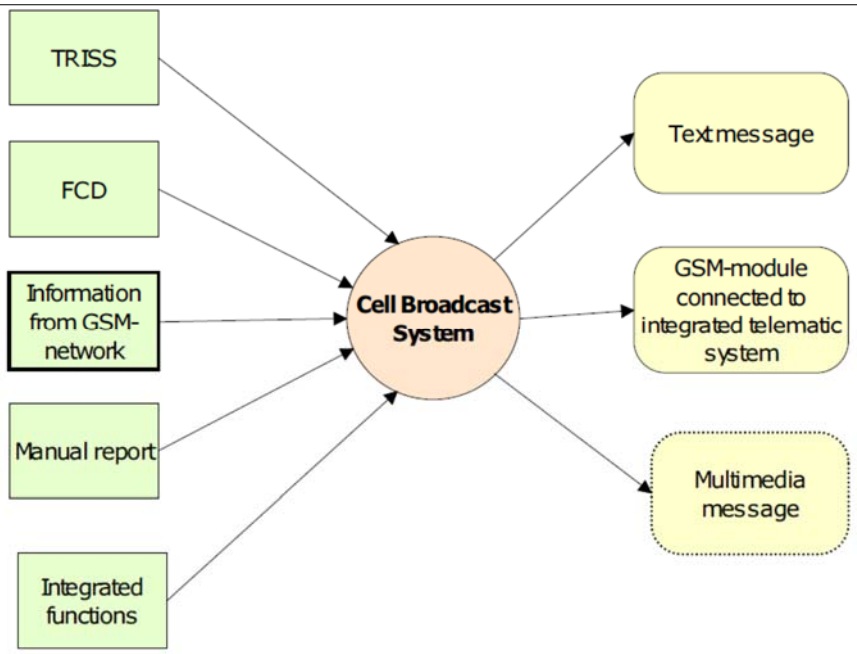
[92] The following table discusses how Gundlegård in view of the 3GPP Standard, Sandhu and Rieger in view of Zimmers renders obvious the claim at issue for the '221 Patent.

Claim 19	Gundlegård in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers
19[pre]. A method of public service broadcast messaging to a broadcast target area, the method comprising:	Gundlegård discloses a method of public service broadcast messaging to a broadcast target area.

Claim 19	Gundlegård in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers
	Ex. 1013, at 3 ¶ 6 ("Cell Broadcast is a technique within GSM and UMTS to broadcast text messages to one or more cells in the network.").
	Ex. 1013, at 5 ¶ 6 ("In order to analyse the effects of an **incident warning system** based on Cell Broadcast a study of relevant tests and literature within incident warning systems and in-car behaviour has been made.") (emphasis added).
	Ex. 1013, at 6 ¶ 6 ("*Chapter six* contains a short description of the services outside automotive telematics that can be offered with Cell Broadcast.").
	Ex. 1013, at 34 ¶ 7 ("Cell Broadcast is also well suited for **local warnings outside the scope of road traffic**." Ex. 1013, at 34 ¶ 7.). (emphasis added).
	The 3GPP Standard, Rieger and Zimmers also disclose a method of public service broadcast messaging to a broadcast target area. Ex. 1019, at Section 2 ("The CBS service is analogous to the Teletex service offered on television, in that like Teletex, it permits a number of unacknowledged general CBS messages to be broadcast to all receivers within a particular region. **CBS messages are broadcast to defined geographical areas known as cell broadcast areas. These areas may comprise of one or more cells, or may comprise the entire PLMN. Individual CBS messages will be assigned their own geographical coverage areas** by mutual agreement between the information provider and the PLMN operator. **CBS messages may originate from a number of Cell Broadcast Entities (CBEs)**, which are connected to the Cell Broadcast Centre. CBS messages are then sent from the CBC to the cells, in accordance with the CBS's coverage requirements.") (emphases added).
	Ex. 1017, Abstract ("A communications system to post arbitrary information to any geographical region simply by outlining the region on a map in the system's user

Claim 19	Gundlegård in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers
	interface and attaching the information to the outlined region is provided."). Ex. 1018, at 1:5-7 ("The present invention relates to the delivery of emergency information to persons needing to be notified of such information."). Ex. 1018, at 4:5-15 ("It is … important that the alert notification system have the ability to pinpoint, calculate and define dynamically all recipients with respect to their notification requirements then systematically notify those individuals (and only those individuals) within those defined geographic locations. The system must provide the notification quickly and accurately, with the ability to track the progress of the notification process and provide scenario resolution status until the notification scenario is completed or until the alert has expired.")
19[a]. receiving over an input interface a broadcast request including a broadcast agent identification, a geographically defined broadcast target area, and a broadcast message from one of a plurality of coupled broadcast agent message origination systems;	Gundlegård discloses receiving over an input interface a broadcast request from one of a plurality of coupled broadcast agent message origination systems. Ex. 1013, at 7 ¶ 3 ("The **content provider** has an **interface** to the **Cell Broadcast Entity (CBE)** that varies depending on **application**.") (emphasis added). Ex. 1013, at 7:  *Figure 3. Overview of the nodes used in Cell Broadcast.* Ex. 1013, at 28 ¶ 1 ("A developed automotive telematics system based on Cell Broadcast can have an information flow as shown in Figure 16."). Ex. 1013, Figure 16:

Claim 19	Gundlegård in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers



Ex. 1013, at 8 ¶ 2 ("The CBE is a client from where it is possible to send Cell Broadcast messages. **The client is usually implemented in a PC and connected to the CBC via Internet**. **The appearance of the CBE interface is fully dependent on the application**.") (emphasis added).

Gundlegård also discloses that the received broadcast request includes a broadcast agent identification, a geographically defined broadcast target area, and a broadcast message.

Ex. 1013, at 8 ¶ 2 ("Some applications will demand a specially developed interface to be implemented. **Many applications can, however, be handled with a map interface where the broadcasting area can be defined and inputs for duration, frequency and message are available**.") (emphases added).

Ex. 1013, at 7 ¶ 2 ("You can choose to send a Cell Broadcast message to the whole network or specify the cells you want to send it to. The message is sent to all mobile terminals in idle mode in the specified area.").

Claim 19	Gundlegård in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers
	Ex. 1013, Table 3: | Octet(s)	Field | |---|---| | 1 | Message type | | 2-3 | Message ID | | 4-5 | Serial number | | 6 | Data coding scheme | | 7-1252 | CB data | *Table 3. Cell Broadcast message format in UMTS.*[5] Ex. 1013, at 11 ¶ 6 ("For a Cell Broadcast message *Message ID*, *Serial number* and *Data coding scheme* are the same as in GSM (see section 2.7.1). The CB data is the **content** of the message.") (emphasis added). Ex. 1013, at 10 ¶ 5 ("The **Message Identifier** defines the **source** (e.g. "Restaurant Jade Garden") … . The **serial number** identifies a particular Cell Broadcast message with the same **message identifier**, the **geographical scope** of the message (cell wide, location area wide, or PLMN wide) and the display mode.") (emphasis added). The 3GPP Standard discloses a broadcast request including a broadcast agent identification, a geographically defined broadcast target area, and a broadcast message. For example, Ex. 1019, at Sections 9.3-9.4 describe message parameters including a broadcast message originator identifier (*e.g.*, the message identifier) and a broadcast target area (*e.g.*, a cell-list or as part of the serial number parameter). Rieger also discloses receiving over an input interface a broadcast request from one of a plurality of coupled broadcast agent message origination systems. Ex. 1017, Figure 1:

Claim 19	Gundlegård in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers

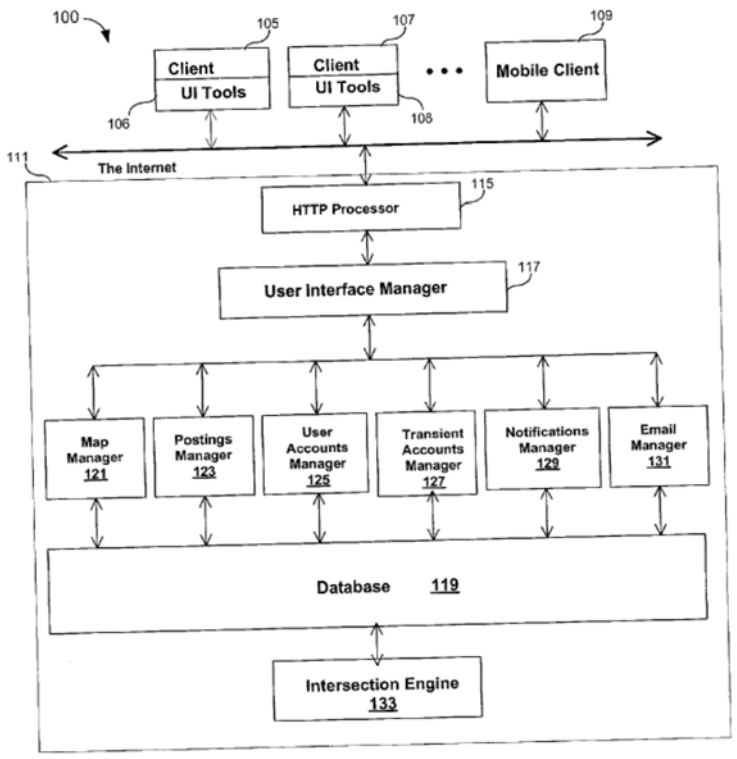
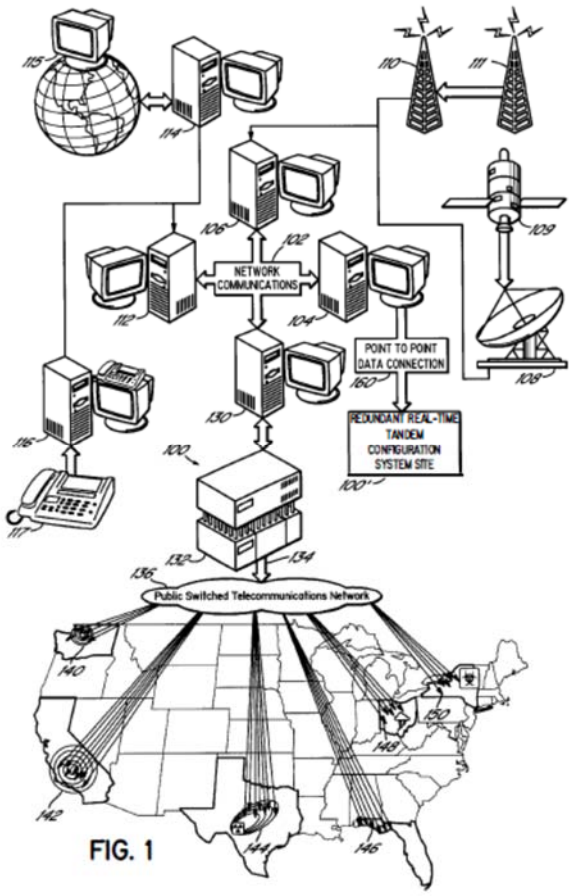


FIG. 1

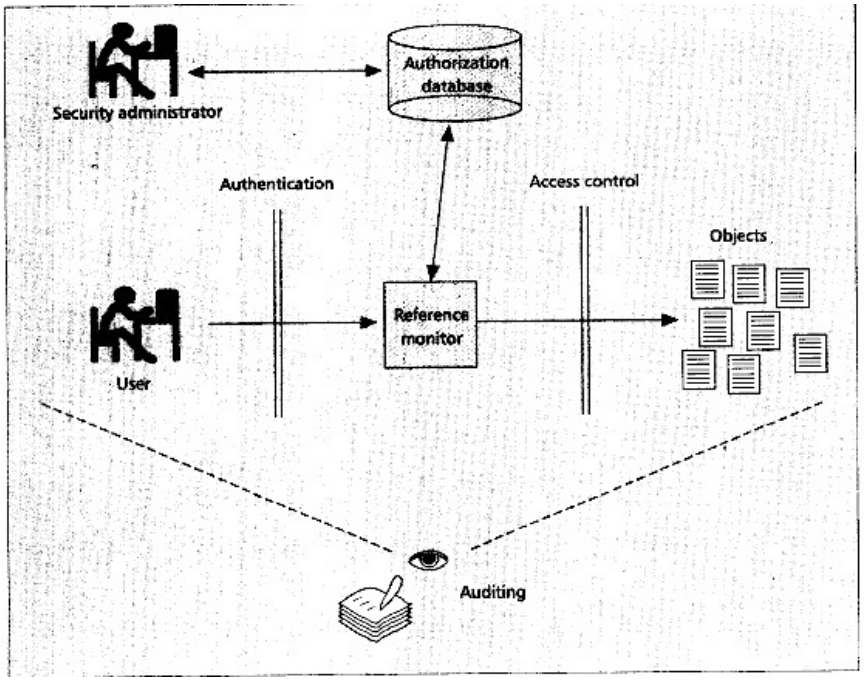
Ex. 1017, at [0073] ("A user interface 117 is also included with the communication server 111. The user interface 117 processes user transactions, and dynamically composes HTML responses containing maps and other graphical elements (such as icons, photos, and the like), drawing in part upon the communications server's 111 map manager 121. The user interface 117 permits users to interact with the communications system's maps via zoom, pan, and drawing primitives … .").

Rieger also discloses that the received broadcast request includes a broadcast agent identification, a geographically defined broadcast target area, and a broadcast message.

Claim 19	Gundlegård in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers
	Ex. 1017, at [0003] ("[T]he target user community for a posting is defined in terms of geographical coordinates, e.g., by a bounded region on a map.").
	Ex. 1017, at [0077] ("Each posting is comprised of an identification tag that describes who has posted it, when it was posted, what its posting category is, and other such factual information about its origin.").
	Ex. 1017, at [0078] ("Postings are further defined by an information component, which is the content of the posting.").
	Ex. 1017, at [0079] ("Each posting is also provided with a 'broadcast' descriptor, which identifies the posting's geographical target region(s).").
	Zimmers also discloses receiving over an input interface a broadcast request from one of a plurality of coupled broadcast agent message origination systems.
	Ex. 1018 at 11:12-18 ("[A]lert conditions may also be identified by **individuals** …. Authorized **individuals** may include ….") (emphases added).
	Ex. 1018, at Figure 1:

Claim 19	Gundlegård in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers
	 FIG. 1 Ex. 1018, at 19:21-24 ("[A] user connects to a web server 114, typically using a hypertext transfer protocol (HTTP) application."). Zimmers also discloses that the received broadcast request includes a broadcast agent identification, a geographically defined broadcast target area, and a broadcast message. Ex. 1018, at 19:24-44 ("[W]eb server 114 receives an Internet protocol (IP) address for the user from the Internet connection. … [T]he user is prompted to enter a login identifier and password via a hypertext markup language (HTML) form, otherwise known as a world wide web-based form. … If the connection is allowed … web server 114 determines the notification text that the user is permitted to create. … [T]he user is prompted

Claim 19	Gundlegård in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers
	again, using the web based form, for a notification type. … . [A]dditional web based forms are used to prompt the user for relevant information for the notification, such as geographic information … .”).
19[b]. storing a geographically defined broadcast message jurisdiction for a broadcasting agent;	Gundlegård does not expressly disclose this element. Rieger discloses the complete “storing” element. Ex. 1017, at [0081] (“Administrators of the communications system 100 can restrict the nature of postings created by any particular user by defining geographic regions into which the user is either authorized or unauthorized to post. Authorized regions can be assigned optional passwords and posting category restrictions that further narrow the user’s posting privileges in those regions. These controls would, for example, permit system administrators to grant specific privileges to a regional authority to create postings of particular categories, e.g., Governmental/Traffic, Governmental/Weather, to particular regions, while excluding all other users from posting those categories to the regions.”). Ex. 1017, at [0082] (“The communications server 111 is also comprised of a user accounts manager 125. The user accounts manager 125 stores and retrieves user account information on demand from the user interface 117.”). Ex. 1017, at [0083] (“In an embodiment, user account information is maintained in a database.”). Ex. 1017, at [0184-85] (“3.9.1 User Account Types … In an embodiment, communications system 200 classifies users by account types, which are defined by subscription packages. Each account type grants or denies access to various system features and resources, defines usage level limits. … . **Posting region size and distance, and ping regions and weekly ping hit counts are examples**

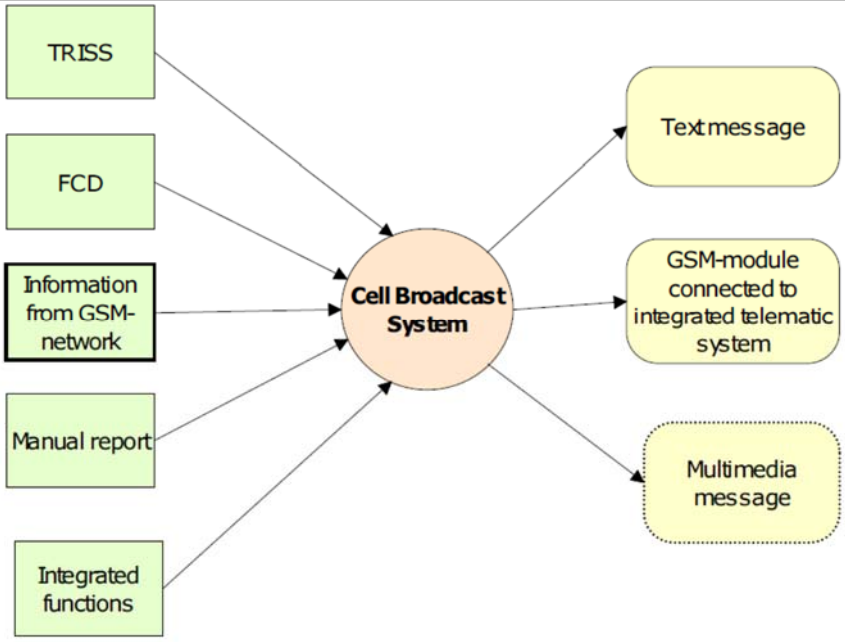
Claim 19	Gundlegård in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers
	of system usage limits that are imposed by the various account types.") (emphasis added). Sandhu discloses storing authorization settings in a database as part of any common access control system. Ex. 1020, at 40 ("Access control is concerned with limiting the activity of legitimate users. It is enforced by a reference monitor which mediates every attempted access by a user (or program executing on behalf of that user) to objects in the system. The reference monitor consults an **authorization database** in order to determine if the user attempting to do an operation is actually authorized to perform that operation.") (emphasis added). Ex. 1020, Figure 1:  Ex. 1020, at 41-42 ("The subject-object distinction is basic to access control. Subjects initiate actions or operations on objects. These actions are permitted or denied in accord with the **authorizations established in the system**.") (emphasis added).

Claim 19	Gundlegård in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers
19[c]. verifying an authority of the broadcast agent identification including an authority of the originating broadcast agent to send the broadcast message to the broadcast target area by comparing the stored geographically defined broadcast message jurisdiction for the originating broadcast agent with the broadcast target area associated with the broadcast message in the broadcast request; and	Gundlegård does not expressly disclose this element completely. But it does teach the importance of a verification step by disclosing a network that handles "authentication" and acknowledges that messages may be successful or unsuccessful. Ex. 1013, at 2 ¶ 9 ("The GSM and UMTS networks consist of a core network (CN) and a base system. The core network includes nodes that handle e.g. **authentication**, subscriber information, and switching.") (emphasis added). Ex. 1013, at 3 ¶ 5 ("The support system contains the Cell Broadcast Centre (CBC) and Cell Broadcast Entities (CBEs) for **every sender of Cell Broadcast messages**.") (emphasis added). Ex. 1013, at 9 ¶ 3 ("It [BSC/RNC] is also responsible for scheduling the messages on the Cell Broadcast Channel (CBCH) **and giving feedback to the CBC about successful or unsuccessful commands**.") (emphasis added). Ex. 1013, Figure 7 (annotation added):  *Figure 7. Information flow for Write-replace command in GSM Cell Broadcast system.*[5]

Claim 19	Gundlegård in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers
	The 3GPP Standard also discloses the importance of a verification step by disclosing a standard that requires message validation. Ex. 1019 at Section 9.3.16 (listing error messages that result from invalid broadcast message records). Rieger discloses this element in its entirety. Ex. 1017, at [0081] ("Administrators of the communications system 100 can restrict the nature of postings created by any particular user by defining geographic regions into which the user is either authorized or unauthorized to post. Authorized regions can be assigned optional passwords and posting category restrictions that further narrow the user's posting privileges in those regions. These controls would, for example, permit system administrators to grant specific privileges to a regional authority to create postings of particular categories, e.g., Governmental/Traffic, Governmental/Weather, to particular regions, while excluding all other users from posting those categories to the regions."). Zimmers provides an example of how limiting the geographical scope of weather alerts can reduce the "cry wolf" syndrome resulting from overbroad emergency broadcasts. *See* Ex. 1018, at 2:49-63. Zimmers also discloses two stages: authentication followed by verifying a broadcast message request as a function of the authority of the originating broadcast agent to send the broadcast message to the broadcast target based on certain parameters in the broadcast message request. Ex. 1018 at 19:35-40 ("**if** the connection is allowed, **then** in step 492 web server 114 determines the notification text that the user is permitted to create. … . The provided notification type is then evaluated in step 496 to

Claim 19	Gundlegård in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers
	determine if it is a type allowed by the server for the user.") (emphases added). And, Sandhu discloses that a basic principle of any access control system is that stored information for an originating user is compared with information associated with the user's request. Ex. 1020 at 44 ("Discretionary protection policies govern the access of users to the information on the basis of the user's identity and authorizations (or rules) that specify, for each user (or group of users) and each object in the system, the access modes (e.g., read, write, or execute) the user is allowed on the object. **Each request of a user to access an object is checked against the specified authorizations. If there exists an authorization stating that the user can access the object in the specific mode, the access is granted, otherwise it is denied**.") (emphasis added).
19[d]. transmitting the broadcast message over an output interface to one or more coupled broadcast message networks providing broadcast message alerting service to at least a portion of the broadcast target area.	Gundlegård discloses transmitting the broadcast message over an output interface to one or more coupled broadcast message networks providing broadcast message alerting service to at least a portion of the broadcast target area. Ex. 1013, at 8 ¶ 2 ("The CBE is a client from where it is possible to **send** Cell Broadcast messages.") (emphasis added). Ex. 1013, Figure 16:

Claim 19	Gundlegård in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers



Ex. 1013 at 34 ¶ 8 ("The fact that messages can be **sent** to the whole country or just to one cell is also important for these kinds of warnings.") (emphasis added).

Ex. 1013 at 16 ¶ 1 ("The BSC is responsible **for queuing, repetition and transmission** of the messages, but the BTS can indicate overflow or underflow on the Cell Broadcast channel.") (emphasis added).

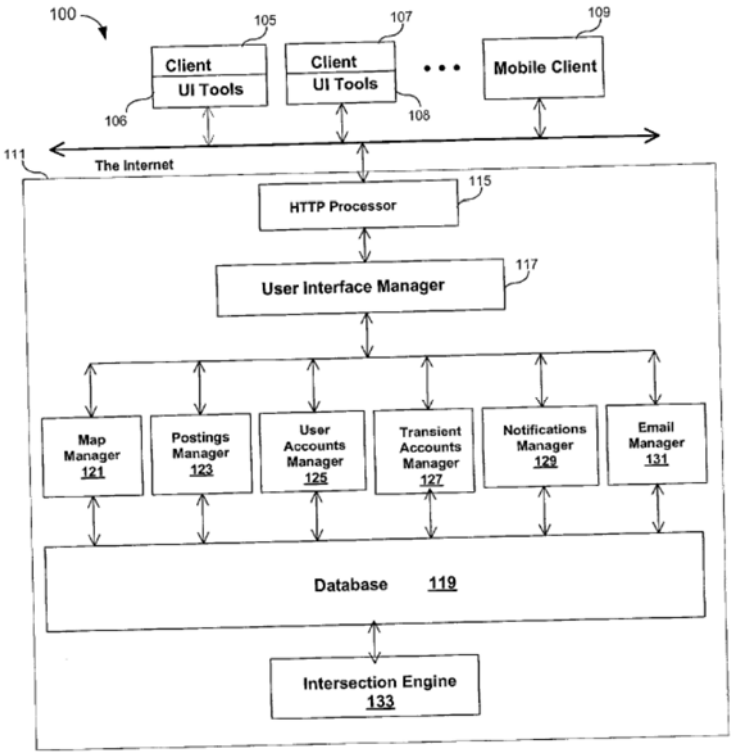
The 3GPP Standard also discloses this element:

Ex. 1019 at 7 ¶ 10 ("**CBS messages are broadcast to defined geographical areas known as cell broadcast areas. These areas may comprise of one or more cells, or may comprise the entire PLMN. Individual CBS messages will be assigned their own geographical coverage areas** by mutual agreement between the information provider and the PLMN operator. **CBS messages may originate from a number of Cell Broadcast Entities (CBEs)**, which are connected to the Cell Broadcast Centre. CBS messages are then sent from the CBC to the cells, in accordance with the CBS's coverage requirements.") (emphasis added).

B. Mani in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers

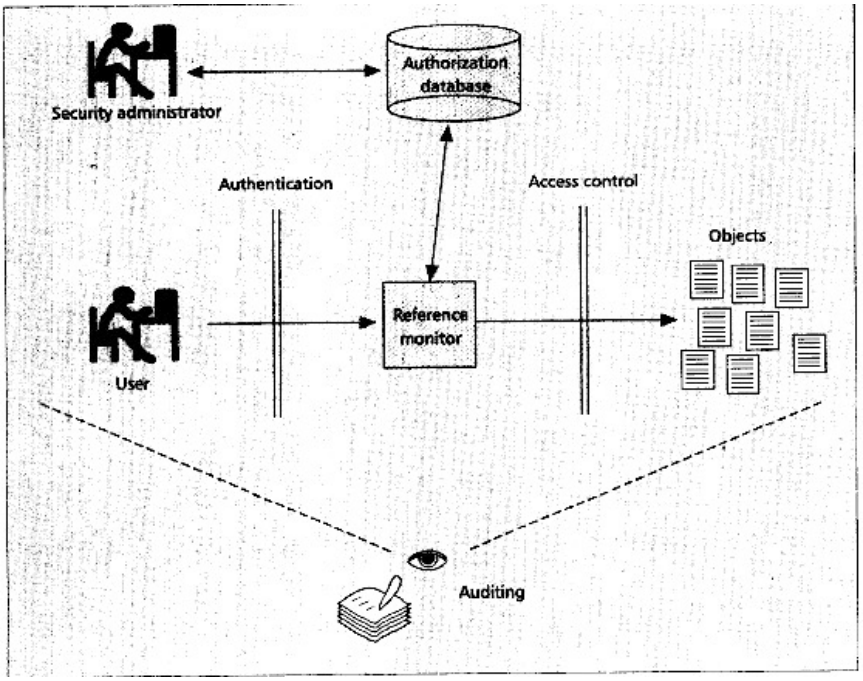
[93] The following table discusses how Mani in view of the 3GPP Standard, Sandhu and Rieger in view of Zimmers renders obvious the claim at issue for the '221 Patent.

Claim 19	Mani in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers
19[pre]. A method of public service broadcast messaging to a broadcast target area, the method comprising:	Ex. 1014, at ¶ 60 ("the present invention advantageously provides an enhanced emergency message notification service… ."); *See also* Ex. 1014, at ¶ 59 ("the emergency message may be transmitted in broadcast mode to the target serving area (step 1004).").
19[a]. receiving over an input interface a broadcast request including a broadcast agent identification, a geographically defined broadcast target area, and a broadcast message from one of a plurality of coupled broadcast agent message origination systems;	Ex. 1014, at ¶ 39 ("A multimedia node or network element 504 is operable to serve a plurality of subscribers, e.g., subscriber 508A operating a multimedia IT device 506A for originating and/or terminating calls."). Broadcast request… Ex. 1014, at ¶ 54 ("The incoming emergency message may preferably include parametric information comprised of, for example, emergency type, magnitude of the emergency, target area to be served, geographic area information relating to the message originator (i.e., authorized entity), and the like."); *See also* Ex. 1015 (incorporated by reference), ¶ 39 (disclosing the use of originator identification information including password and loginID information."). Ex. 1019 goes into great detail describing the message parameters, including message type, message ID (for source), and geographic area. See Ex. 1019, Sections 9.3-

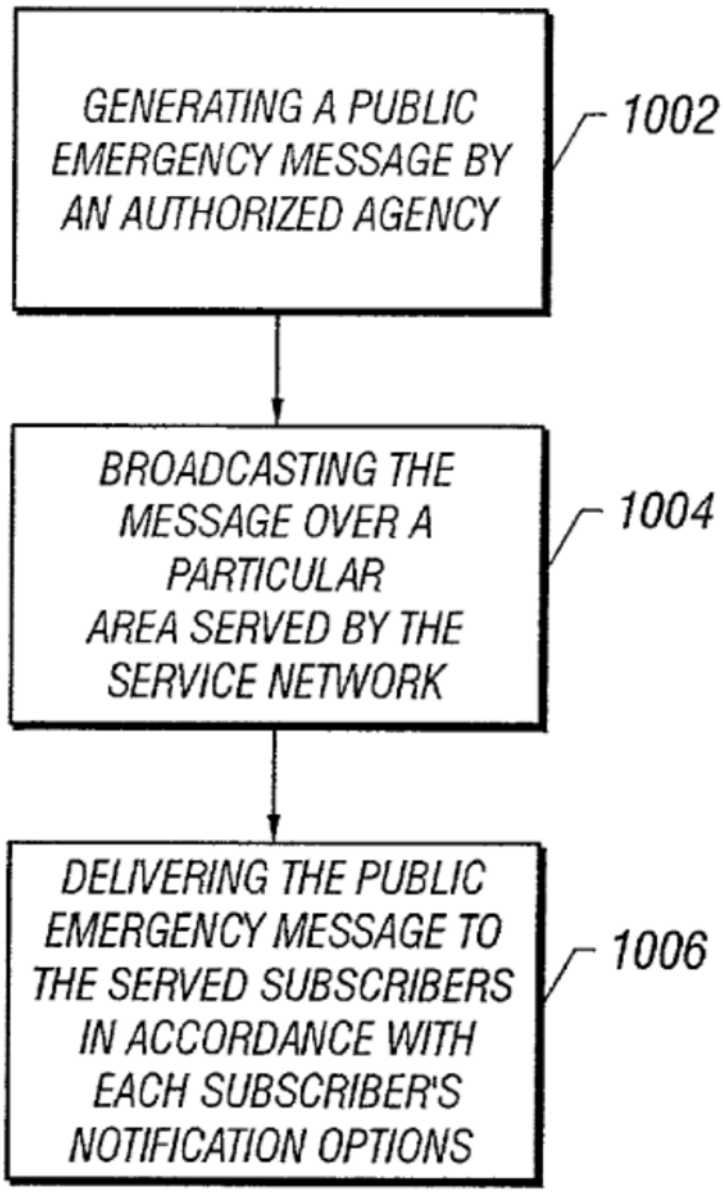
Claim 19	Mani in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers
	9.4 (describing message parameters including a broadcast message originator identifier (*e.g.*, the message identifier) and a broadcast target area (*e.g.*, a cell-list or as part of the serial number parameter). Rieger also discloses receiving over an input interface a broadcast request from one of a plurality of coupled broadcast agent message origination systems. Ex. 1017, Figure 1:  FIG. 1 Ex. 1017, at [0073] ("A user interface 117 is also included with the communication server 111. The user interface 117 processes user transactions, and dynamically composes HTML responses containing maps and other graphical elements (such as icons, photos, and the like), drawing in part upon the communications server's 111 map manager 121. The user interface 117 permits users to interact with the

Claim 19	Mani in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers
	communications system's maps via zoom, pan, and drawing primitives … ."). Rieger also discloses that the received broadcast request includes a broadcast agent identification, a geographically defined broadcast target area, and a broadcast message. Ex. 1017, at [0003] ("[T]he target user community for a posting is defined in terms of geographical coordinates, e.g., by a bounded region on a map."). Ex. 1017, at [0077] ("Each posting is comprised of an identification tag that describes who has posted it, when it was posted, what its posting category is, and other such factual information about its origin."). Ex. 1017, at [0078] ("Postings are further defined by an information component, which is the content of the posting."). Ex. 1017, at [0079] ("Each posting is also provided with a 'broadcast' descriptor, which identifies the posting's geographical target region(s)..").
19[b]. storing a geographically defined broadcast message jurisdiction for a broadcasting agent;	Mani does not expressly disclose storing geographic jurisdiction for a broadcasting agent. Rieger (Ex. 1017) discloses this feature. *See* Ex. 1017, at ¶ 81 ("Administrators of the communications system 100 can restrict the nature of postings created by any particular user by defining geographic regions into which the user is either authorized or unauthorized to post. Authorized regions can be assigned optional passwords and posting category restrictions that further narrow the user's posting privileges in those regions. These controls would, for example, permit system administrators to grant specific privileges to a regional authority to create postings of particular categories, e.g., Governmental/Traffic, Governmental/Weather, to particular regions, while excluding all other users from

Claim 19	Mani in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers
	posting those categories to the regions."); *see also* Ex. 1017, at ¶¶ 184-185 (explaining the use of the system for different user account types for sending messages to different jurisdictions: "Posting region size and distance are examples of system usage limits that are imposed by the various account types."). Sandhu discloses storing authorization settings in a database as part of any common access control system. Ex. 1020, at 40 ("Access control is concerned with limiting the activity of legitimate users. It is enforced by a reference monitor which mediates every attempted access by a user (or program executing on behalf of that user) to objects in the system. The reference monitor consults an **authorization database** in order to determine if the user attempting to do an operation is actually authorized to perform that operation.") (emphasis added).
19[c]. verifying an authority of the broadcast agent identification including an authority of the originating broadcast agent to send the broadcast message to the broadcast target area by comparing the stored geographically defined broadcast message jurisdiction for the originating broadcast agent with the broadcast target area associated with the broadcast message in	Rieger (Ex. 1017) in view of Zimmers (Ex. 1018) disclose this feature and motivation for providing it. *See* Ex. 1017, at ¶ 81 ("Administrators of the communications system 100 can restrict the nature of postings created by any particular user by defining geographic regions into which the user is either authorized or unauthorized to post. Authorized regions can be assigned optional passwords and posting category restrictions that further narrow the user's posting privileges in those regions. These controls would, for example, permit system administrators to grant specific privileges to a regional authority to create postings of particular categories, e.g., Governmental/Traffic, Governmental/Weather, to particular regions, while excluding all other users from posting those categories to the regions."). Ex. 1018 (Zimmers) provides an example of how limiting the geographical scope of weather alerts can

Claim 19	Mani in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers
the broadcast request; and	reduce the "cry wolf" syndrome resulting from overbroad emergency broadcasts. *See* Ex. 1018, at 2:49-63. Ex. 1020 (Sandhu) also explains a background description of basic authorization and auditing concepts well-known in the art. "Access control is concerned with limiting the activity of legitimate users. It is enforced by a reference monitor which mediates every attempted access by a user (or program executing on behalf of that user) to objects in the system. The reference monitor consults an authorization database in order to determine if the user attempting to do an operation is actually authorized to perform that operation." Ex. 1020, at 40.  "Access control assumes that authentication of the user has been successfully verified prior to enforcement of access control via a reference monitor." Ex. 1020, at 40. "Discretionary protection policies govern the access of users to the information on the basis of the user's identity

Claim 19	Mani in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers
	and authorizations (or rules) that specify, for each user (or group of users) and each object in the system, the access modes (e.g., read, write, or execute) the user is allowed on the object. Each request of a user to access an object **is checked against the specified authorizations**. If there exists an authorization stating that the user can access the object in the specific mode, the access is granted, otherwise it is denied." Ex. 1020, at 44 (emphasis added). Thus, Sandhu, Rieger and Zimmers disclose storing a defined jurisdictional area for a message sender, and setting a user restriction wherein a request to broadcast a message "is checked against the specified authorizations" as taught by Sandhu and Rieger to verify the sender's authority.

Claim 19	Mani in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers
19[d]. transmitting the broadcast message over an output interface to one or more coupled broadcast message networks providing broadcast message alerting service to at least a portion of the broadcast target area.	 FIG. 10 Mani explains that notifications can be distributed across multiple networks. "It should be appreciated by those skilled in the art upon reference hereto that in one embodiment, the network 502 may be comprised of a

Claim 19	Mani in View of the 3GPP Standard, Sandhu and Rieger in View of Zimmers
	combination of various PSN and CSN portions and their hybrids, including local and inter-carrier network portions. A multimedia node or network element 504 is operable to serve a plurality of subscribers, e.g., subscriber 508A operating a multimedia IT device 506A for originating and/or terminating calls … it should be recognized that the softswitch functionality may also be provided as part of the serving multimedia node 504. A call treatment server 512 is provided as an application server node coupled to the network 502, wherein suitable multimedia service logic 513 is provided for querying a subscriber emergency notification profile database. Again, as alluded to hereinabove, it should be apparent that the functionality of the call treatment server node 512 may be distributed or embedded, depending upon the service architecture and application layering." (Ex. 1014, ¶¶ 39-40.) The 3GPP Standard also discloses this element: Ex. 1019, at 7 ¶ 10 ("**CBS messages are broadcast to defined geographical areas known as cell broadcast areas. These areas may comprise of one or more cells, or may comprise the entire PLMN. Individual CBS messages will be assigned their own geographical coverage areas** by mutual agreement between the information provider and the PLMN operator. **CBS messages may originate from a number of Cell Broadcast Entities (CBEs)**, which are connected to the Cell Broadcast Centre. CBS messages are then sent from the CBC to the cells, in accordance with the CBS's coverage requirements.") (emphasis added).

XIII. MOTIVATION TO COMBINE PRIOR ART REFERENCES

[94] The following sections explain why a person of ordinary skill in the art would combine the references, as grouped in the preceding charts.

A. Motivation to Combine Gundlegård with the 3GPP Standard

[95] Gundlegård (Ex. 1013) is not directed to specific message formatting for the cell broadcast messaging service. Instead, Gundlegård discloses a number of potential applications, from the content provider and network provider's points of view, of the 3GPP cell broadcast messaging standard (Ex 1019). This standard was written to enable the development of cell broadcast messaging applications. A person of ordinary skill in the art would understand that such a standard would be necessary to implement a cell broadcast messaging service. And, Gundlegård explicitly draws on the 3GPP Standard, for example, by citing it as reference number 5 in the bibliography.

[96] Gundlegård suggests a number of potential applications in Section 6, including local warnings (Section 6.5) and weather forecasts and warnings (Section 6.6). Similarly, the 3GPP Standard contemplates the use of cell broadcast messaging in many applications, including traffic, weather and entertainment. The General Description section of the 3GPP Standard (Ex. 1019, at 7) provides traffic and weather examples, and also provides in Figure 6 an index structure with many exemplary message topics, including local and national news, weather and sports. (Ex. 1019, at 34.) Accordingly, both Gundlegård and the 3GPP Standard are from the same field of endeavor.

[97] Certainly, and in my experience, when designing and implementing any

value-added application that uses cellular network telecommunications, a person of ordinary skill in the art would rely on the applicable standard specifications—that's why they're developed. The application would either develop or use the existing standard interfaces so that it is compatible with cellular network equipment and systems from different manufacturers. In any cell broadcast messaging application, the 3GPP Standard is among the most applicable standards.

B. Motivation to Combine Gundlegård with Sandhu

[98] Gundlegård suggests a number of business models for a cell broadcast messaging service based on which party would be charged for the service (Ex. 1013, Section 2.10 at 13) and business models (Ex. 1013, Section 3.2 at 20). A person of ordinary skill would understand that addressing the problem of allocating costs as suggested in Gundlegård would require an access, authorization and auditing scheme. Sandhu provides a background description of basic authorization and auditing concepts that would form the understanding of a person of ordinary skill in the art seeking to implement such a scheme. "[A]ccess control is not a complete solution for securing a system. It must be coupled with auditing. … Auditing requires the registration (logging) of all user requests and activities for their later analysis. ... [A]uditing can be useful for determining possible flaws in the security system. Finally, auditing is essential to ensure that authorized users do not misuse their privileges." (Ex. 1020, at 40.)

[99] Furthermore, auditing procedures do not just assist in ensuring security; they are required for competent commercial operations, such as billing, accounting, auditing, marketing, engineering and other reasons. To audit the system for such reasons, data must be recorded and logged such that the audit function can analyze that data.

[100] Combining the teachings of Sandhu with Gundlegård is thus a predictable use of known techniques to achieve expected results in messaging applications (*e.g.*, to maintain system security, facilitating billing) to solve a common problem (*e.g.*, maintaining system security and facilitating billing).

C. Motivation to Combine Gundlegård with Rieger in View of Zimmers

[101] As discussed above, a person of ordinary skill in the art would combine Gundlegård with Zimmers. Gundlegård teaches that the message originator may specify the geographic area of the message. For example, Gundlegård explains in Section 2.2 that "[m]any applications can … be handled with a map interface where the broadcasting area can be defined." There are practical and safety considerations for enabling geographic area limitations. For example, Zimmers provides an example of how limiting the geographic scope of weather alerts can reduce the "Boy Who Cried Wolf" problem resulting from overly broad emergency broadcasts. (Ex. 1018, Col. 2:59-63.) Leaving "uninterested citizens undisturbed" avoids this problem. (Ex. 1018, Col. 5:21-24).

[102] In addition, a person of ordinary skill in the art would know that there are engineering and commercial or financial reasons to limit the broadcast area of a message. From an engineering perspective, it is always a standard principle to economize, optimize and not waste the computer resources involved in real-time communications systems. There is no way to truly predict when a messaging communications system will experience an overload condition, traffic congestion or a partial fault impacting the flow of messages; thus, it is always a technical design consideration to provide optimal solutions that are appropriate and commensurate with the problem being solved. From a commercial or financial perspective, cost recovery and commercial fees may be based on the number of messages broadcast, the broadcast area, the particular cost to connect to cellular networks to broadcast the message, etc. In addition, from a consumers perspective, they do not want to be needlessly subjected to and charged for irrelevant, unsuitable or unproductive broadcast messages they received, especially while roaming.

[103] Rieger discloses a communication system for posting geographically-relevant messages to recipients by "outlining a region on a map." (Ex. 1017, Abstract). Rieger details a number of user interfaces for implementing its system. For example, Rieger explains the use of the system for different user account types for sending messages to different jurisdictions. "Posting region size and distance are examples of system usage limits that are imposed by the various account types." (Ex.

1017, ¶¶ 184-185.) More specifically, Rieger discloses an example of governmental traffic alerts in addition to separate government alerts related to weather. In both cases, the geographic region of the alert is restricted depending on the sender. Specifically, Rieger provides the following (Ex. 1017, ¶¶ 81.):

> "Administrators of the communications system 100 can restrict the nature of postings created by any particular user by defining geographic regions into which the user is either authorized or unauthorized to post. Authorized regions can be assigned optional passwords and posting category restrictions that further narrow the user's posting privileges in those regions. These controls would, for example, permit system administrators to grant specific privileges to a regional authority to create postings of particular categories, e.g., Governmental/Traffic, Governmental/Weather, to particular regions, while excluding all other users from posting those categories to the regions."

[104] Significantly, Rieger teaches restricting message distribution based on two criteria: (1) the message category and (2) the applicable geographic region.

[105] Based on the combined teachings of Rieger and Zimmers, a person of ordinary skill in the art would be motivated to implement a geographic restriction on a user-by-user basis in the system of Gundlegård. There are obvious safety benefits based on the teachings of Zimmers. And, there are also engineering and commercial or financial benefits. Rieger reinforces this implementation by expressly disclosing an application that prohibits a user from posting messages beyond a geographic area authorized for that user.

[106] As discussed above, Gundlegård discloses a number of business opportunities, including weather alerts, with different user-charging schemes.

Zimmers (Ex. 1018) teaches an alert notification system with multiple users. (*See* Col. 11:12-18.) ("[A]lert conditions may also be identified by *individuals* …. Authorized *individuals* may include ….") (emphases added). These two references are therefore from the same field of endeavor, *i.e.*, user-generated emergency alerts, including weather. Zimmers teaches that there should be two stages of security in such a system: (1) user authentication and (2) user privileges. For example, Zimmers (Ex. 1018, at Col. 19:35-40) says (emphases added), "*if* the connection is allowed, *then* in step 492 web server 114 determines the notification text that the user is permitted to create. … . The provided notification type is then evaluated in step 496 to determine if it is a type allowed by the server for the user." Zimmers depicts the two stages of user authentication and user privileges (Figure 10 below). (Ex. 1018, FIG. 4D.)

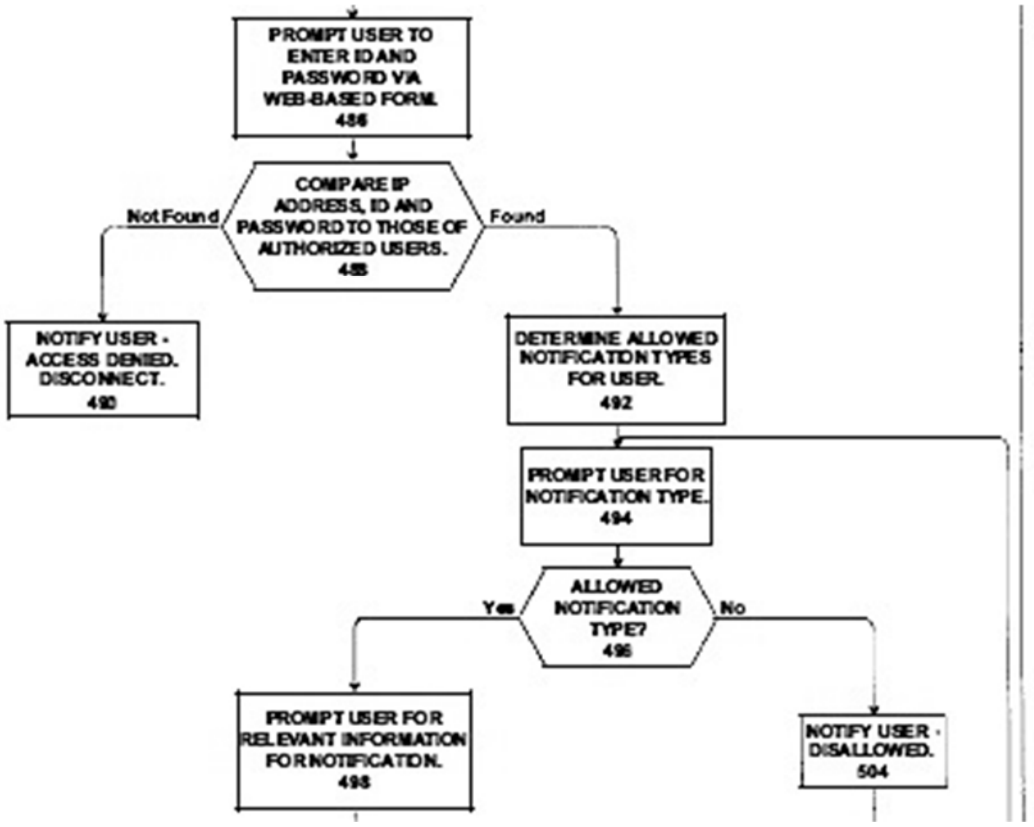


Figure 10

[107] A person of ordinary skill in the art would certainly understand the need for these two stages. For example, for user privileges to be properly applied to a system user in the case where fees are applied for those particular privileges, it is first necessary to know the user they are being applied to. Gundlegård discloses the capability to enable charging for different users of a cell broadcast messaging system. Thus, a user who is granted privileges to broadcast a particular message type can only be charged for sending that message type if the system knows who that user is.

D. Motivation to Combine Mani with the 3GPP Standard

[108] Although Mani (Ex. 1015) discloses using certain "parametric information" in broadcast messages, it is not directed to specific message formatting for cell broadcast. Instead, Mani discloses a flexible system designed to broadcast emergency messages over multiple networks, including to a broadcast target area. A person of ordinary skill in the art would understand that a standard message formatting protocol would be necessary to implement Mani to broadcast emergency messages via the cell broadcast messaging service. A person of ordinary skill in the art would naturally choose the 3GPP Standard, which was written to enable the development of cell broadcast messaging applications. And, ¶ 31 of Mani explicitly references the Public Land Mobile Network ("PLMN") for wireless telephony.

[109] A person of ordinary skill in the art would understand that the particular term of art, PLMN, is used to designate a particular cellular network. The PLMN identification designation is the highest hierarchical level when describing cellular network components and technology. For example, a particular cell in a cellular network is identified by a cell ID. A cell can belong (with other cells) to a "location area" (denoted as a location area code or LAC) or a "service area" (denoted as a location area code or SAC). A location area (LAC) or service area (SAC) can belong, with other areas, to a PLMN identified by its PLMN ID. This is significant because the cell-list parameter used to specify the geographic area for the cell broadcast

message in UMTS networks can be a service area identifier or "SAI." An SAI is defined as the combination of the PLMN ID and LAC and SAC.

[110] The implication for specifying the geographic area using such a comprehensive hierarchy is that a CBE and/or a CBC can transmit messages for broadcast to multiple PLMNs, meaning multiple cellular networks; otherwise, there would be no reason to use a PLMN identifier to specify a geographic area. Therefore, a person of ordinary skill in the art would accordingly look to the 3GPP Standard to implement the system of Mani.

E. Motivation to Combine Mani with Sandhu

[111] Mani (Ex. 1015) does not disclose how to implement user roles. Nevertheless, Mani does discuss the concept of different users having different authorizations and privilege levels. In particular, Mani states, "emergency notification of the present invention can be based on: (i) privilege/authorization level of the calling party, (ii) nature of notification and criticality/nature of … the privilege level can be established by "operator verification," alluded to in the foregoing description." (Ex. 1015, ¶ 55.)

[112] Mani also discloses the importance of certain administrative functions in managing its system. For example, Mani teaches including an "event log module 232" and a "billing module 238." (Ex. 1015, ¶ 30.)

[113] A person of ordinary skill in the art would understand that

implementing user roles and the administrative functions taught by Mani would involve the teachings of Sandhu, which provides a comprehensive background description of basic authorization and auditing concepts well-known in the art. "[A]ccess control is not a complete solution for securing a system. It must be coupled with auditing. …. Auditing requires the registration (logging) of all user requests and activities for their later analysis. …. [A]uditing can be useful for determining possible flaws in the security system. Finally, auditing is essential to ensure that authorized users do not misuse their privileges." (Ex. 1020, at 40.)

[114] Auditing procedures do not just assist in ensuring security; they are required for competent commercial operations, such as billing, accounting, auditing, marketing, engineering and other reasons. To audit the system for such reasons, data must be recorded and logged such that the audit function can analyze that data.

[115] Combining the teachings of Sandhu with Mani is thus a predictable use of known techniques to achieve expected results in messaging applications (*e.g.*, to maintain system security, facilitating billing) to solve a common problem (*e.g.*, maintaining system security and facilitating billing).

F. Motivation to Combine Mani with Rieger in View of Zimmers

[116] As discussed above, a person of ordinary skill in the art would combine Mani with Zimmers. Mani teaches sending a broadcast message to a specific target area. For example, Mani depicts at Element 1004 in Figure 10 that the system is

"BROADCASTING THE MESSAGE OVER A PARTICULAR AREA SERVED BY THE SERVICE NETWORK." (Ex. 1014, FIG. 10.)

[117] Mani further teaches that, "the emergency message may be transmitted in broadcast mode to the target serving area (step 1004)." (Ex. 1014, ¶ 59.) There are practical and safety considerations for enabling geographic area limitations. For example, Zimmers provides an example of how limiting the geographic scope of weather alerts can reduce the "Boy Who Cried Wolf" problem resulting from overly broad emergency broadcasts. (Ex. 1018, Col. 2:59-63.) Leaving "uninterested citizens undisturbed" avoids this problem. (Ex. 1018, Col. 5:21-24).

[118] In addition, a person of ordinary skill in the art would know that there are engineering and commercial or financial reasons to limit the broadcast area of a message. From an engineering perspective, it is always a standard principle to economize, optimize and not waste the computer resources involved in real-time communications systems. There is no way to truly predict when a messaging communications system will experience an overload condition, traffic congestion or a partial fault impacting the flow of messages; thus, it is always a technical design consideration to provide optimal solutions that are appropriate and commensurate with the problem being solved. From a commercial or financial perspective, cost recovery and commercial fees may be based on the number of messages broadcast, the broadcast area, the particular cost to connect to cellular networks to broadcast

the message, etc. In addition, from a consumers perspective, they do not want to be needlessly subjected to and charged for irrelevant, unsuitable or unproductive broadcast messages they received, especially while roaming.

[119] Rieger discloses a communication system for posting geographically-relevant messages to recipients by "outlining a region on a map." (Ex. 1017, Abstract). Rieger details a number of user interfaces for implementing its system. For example, Rieger explains the use of the system for different user account types for sending messages to different jurisdictions. "Posting region size and distance are examples of system usage limits that are imposed by the various account types." (Ex. 1017, ¶¶ 184-185.) More specifically, Rieger discloses an example of governmental traffic alerts in addition to separate government alerts related to weather. In both cases, the geographic region of the alert is restricted depending on the sender. Specifically, Rieger provides the following (Ex. 1017, ¶¶ 81.):

> "Administrators of the communications system 100 can restrict the nature of postings created by any particular user by defining geographic regions into which the user is either authorized or unauthorized to post. Authorized regions can be assigned optional passwords and posting category restrictions that further narrow the user's posting privileges in those regions. These controls would, for example, permit system administrators to grant specific privileges to a regional authority to create postings of particular categories, e.g., Governmental/Traffic, Governmental/Weather, to particular regions, while excluding all other users from posting those categories to the regions."

[120] Significantly, Rieger teaches restricting message distribution based on two criteria: (1) the message category and (2) the applicable geographic region.

[121] Based on the combined teachings of Rieger and Zimmers, a person of ordinary skill in the art would be motivated to implement a geographic restriction on a user-by-user basis in the system of Gundlegård. There are obvious safety benefits based on the teachings of Zimmers. And, there are also engineering and commercial or financial benefits. Rieger reinforces this implementation by expressly disclosing an application that prohibits a user from posting messages beyond a geographic area authorized for that user.

XIV. CONCLUSION

[122] It is my professional opinion that claim 19 of the '221 Patent is invalid as it is "obvious" to one of ordinary skill in the art at the time of the invention under 35 U.S.C. § 103.

[123] The opinions expressed above represent my current opinions. I reserve the right to supplement my Expert Report based on any new information I may learn after the date of this report, or based on information contained in any expert report served by the Patent Owners. I intend to rely on the materials listed above and may use one or more of the pages of these documents as exhibits. In addition, I may use one or more demonstrative exhibits at trial, or in my written testimony, for illustration purposes.

DATE: November 1st, 2016

Randall A. Snyder

Randall A. Snyder