

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AT&T MOBILITY LLC, AT&T SERVICES INC., ERICSSON INC., NOKIA OF
AMERICA CORPORATION, T-MOBILE USA, INC
Petitioners,

v.

DAINGEAN TECHNOLOGIES LTD.,
Patent Owner.

Case No. IPR2024-00402
U.S. Patent No. 10,841,958

DECLARATION OF DR. WAYNE STARK

TABLE OF CONTENTS

I.	Introduction.....	1
II.	Qualifications.....	2
	A. Educational Background and Academia Experiences	2
	B. Industry Experience.....	3
	C. Patents.....	4
	D. List of Prior Testimony	4
III.	Materials Reviewed and Considered	4
IV.	My Understanding of Certain Patent Law Principles.....	5
V.	Level of Ordinary Skill in the Art	11
VI.	Technical Background.....	13
VII.	Overview of The '958 Patent.....	19
VIII.	Claim Construction.....	21
IX.	Prior Art.....	22
	A. Lee	22
	1. Overview of Lee.....	22
	2. Lee is Entitled to its Provisional Filing Date.....	31
	B. Brismar	54
	1. Overview of Brismar.....	54
X.	Claims 1-4 are Unpatentable	60
	A. Ground 1: The Challenged Claims are Anticipated and/or Rendered Obvious by Lee	60
	B. Ground 2: Brismar.....	86
	1. The Challenged Claims are Anticipated and/or Rendered Obvious by Brismar	86
XI.	Conclusion	107

I, Dr. Wayne Stark, declare as follows:

I. INTRODUCTION

1. I have been retained by Petitioners and their counsel, McKool Smith P.C. (“McKool Smith”), as an independent expert consultant in this proceeding regarding U.S. Patent No. 10,841,958 (“the ’958 Patent”) (EX. 1001). I have been asked to consider whether certain references disclose or suggest the limitations recited in Claims 1-4 of the ’958 Patent (“the Challenged Claims”).

2. I am being compensated for my work in this proceeding at a rate of \$600 per hour and receiving reimbursement for expenses incurred in the course of my work. My compensation is in no way contingent on the nature of my findings, the presentation of my findings in testimony, or the outcome of this or any other proceeding. I have no other interest in this proceeding.

3. This declaration is directed to the Challenged Claims of the ’958 Patent and sets forth certain opinions I have formed, the conclusions I have reached, and the bases for each. The conclusions I present are based on my own judgment. I am not an employee of the Petitioners, McKool Smith, the inventors of the ’958 Patent, or of any affiliated companies.

4. Based on my experience, knowledge of the art at the relevant time, and analysis of prior art references, it is my opinion that the Challenged Claims of the

'958 Patent are unpatentable over the prior art references discussed below.

II. QUALIFICATIONS

A. Educational Background and Academia Experiences

5. I received a Bachelor's of Science Degree in 1978, a Master's of Science Degree in 1979, and a Ph.D. in 1982, all in Electrical Engineering, and all from the University of Illinois. Since that time, I have been at the University of Michigan, where I am a Professor of Electrical Engineering and Computer Science.

6. In 1985, the National Science Foundation awarded me the Presidential Young Investigator Award. I served on a National Science Foundation Panel investigating Wireless Technologies around the world.

7. In 1997, I was named an IEEE fellow for my contributions to coding and modulation for spread-spectrum systems. I was an associate editor for the IEEE Transactions on Communications. I was a member of the board of governors of the IEEE Information Society. I served as a guest editor for the IEEE Journal on Selected areas in Communications and am currently on the editorial board of the IEEE Journal on Selected Areas in Communications.

8. I have received several awards for my professional achievements. For example, I received the 2002 Military Communications Conference (MILCOM) Technical Achievement Award. In 2009, MILCOM awarded me the Best Paper Award for my paper titled "Enhancing Cognitive Radio Dynamic Spectrum Sensing

Through Adaptive Learning.” Additionally, in 2010, the Journal of Communications and Network awarded me the Best Paper Award for my paper titled “Minimum Energy-Per-Bit Wireless Multi-Hop Networks with Spatial Reuse.”

9. I also received research funding from the National Science Foundation, the Army Research Office, and the Defense Advanced Research Projects Agency. Many of the research projects related to the use of error control coding in wireless communication systems.

10. During the course of my professional career, I have authored and coauthored more than 200 publications in the field of wireless communications, including publications addressing various aspects of wireless communication protocols and error control coding as applied to spread-spectrum systems.

11. A complete list of my publications appears in my curriculum vitae (CV) attached as Exhibit 1, which I incorporate by reference herein.

B. Industry Experience

12. I have consulted with a number of companies, including Ericsson. I spent 9 months at Ericsson in North Carolina while on sabbatical from my teaching role in the 1996-1997 time frame. During that time, I did research on various topics related to cellular communications and satellite communications.

13. Over the last 40 years, I have conducted fundamental research in academia and in industry on wireless communications. I have taken sabbaticals or

leaves of absence from my academic career to work in industry, including 1 year at IBM in Zurich, Switzerland; 9 months at Ericsson in Cary, North Carolina; 3 months at Microsoft in Redmond, Washington; and 6 months at Uhnder in Austin, Texas. In these roles, I have worked on practical aspects of wireless communications, including satellite communications and cellular communications. I have also worked on the development of radar systems.

C. Patents

14. I am a named inventor or co-inventor on 13 U.S. patents, including patents related to telecommunication systems. My patents are identified in my CV (Exhibit 1).

D. List of Prior Testimony

15. I have served as expert witnesses on cases involving telecommunication systems, including cellular, Wi-Fi, and satellite systems. A list of cases in which I have testified during the last four years appears in my CV (Exhibit 1).

III. MATERIALS REVIEWED AND CONSIDERED

16. My findings contained in this declaration are based on my education, research, experience, and background in the field of computer and communication networks, and specifically, in relation to wireless communication systems, as well as on my investigation and study of prior art references and other documents

disclosed in this declaration, including the following:

Exhibit No.	Description
EX. 1001	U.S. Pat. No. 10,841,958 (“the ’958 Patent”)
EX. 1004	U.S. Pat. Publication No. 2019/0158988 (“Lee”)
EX. 1005	U.S. Pat. Publication No. 2015/0382284 (“Brismar”)
EX. 1006	U.S. Provisional Patent Application No. 62/334,418 (“Lee Provisional”)
EX1007	’958 Patent File History

IV. MY UNDERSTANDING OF CERTAIN PATENT LAW PRINCIPLES

17. As a technical expert, I am not offering any legal opinions. Rather, I am offering technical assessments and opinions. In rendering my analysis, I have been informed by counsel regarding various legal standards for determining patentability. I have applied those standards in forming my technical opinions expressed in this declaration.

18. I understand that in this proceeding, Petitioners have the burden of proving that the Challenged Claims are invalid by a preponderance of the evidence. I understand that “preponderance of the evidence” means that a fact or conclusion is more likely true than not true.

19. The patent Claims define the invention made by the inventors and define what the patent owner owns and what the owner may prevent others from using. I understand that an independent Claim sets forth all the requirements that must be met to be covered by that Claim. I further understand that a dependent Claim

does not itself recite all of the requirements of the Claim but refers to another Claim and incorporates all of the requirements of the Claim to which it refers.

20. I understand that a Claim in an issued patent is unpatentable as anticipated if the recited invention is described in a single prior-art reference that discloses each limitation, either expressly or inherently.

21. It is my understanding that a claimed invention is unpatentable if the differences between the invention and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Obviousness, as I understand it, is based on the scope and content of the prior art, the differences between the prior art and the Claim, and the level of ordinary skill in the art.

22. I understand that under 35 U.S.C. § 103, “[a] patent for a claimed invention may not be obtained though the invention is not identically disclosed or described as set forth in section 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.”

23. I understand that a patent Claim may be unpatentable as obvious over a single prior art reference or in view of a combination of prior art references. I

understand that prior art references may also be combined with the knowledge of a person of ordinary skill in the art. I further understand that a person of ordinary skill in the art is presumed to know the relevant prior art. I understand that the obviousness analysis may take into account the inferences and creative steps that a person of ordinary skill in the art would employ.

24. I understand that when evaluating obviousness, one must not consider whether the claimed invention would have been obvious to a layman or to an expert; not use hindsight when comparing the prior art to the claimed invention; and not consider what was learned from the teachings of the patent. In particular, I understand that it is improper to use the patent Claims as a road map for selecting and combining items of prior art. In other words, one should avoid using the challenged patent as a guide through the prior art references, combining the right references in the right way so as to achieve the result of the Claims at issue. Instead, one must put oneself in the place of a person of ordinary skill at the time the invention was made and consider only what was known before the invention was made.

25. I understand that obviousness should be considered in light of the problems known to the person having ordinary skill in the art at the relevant time and the complexity of the alternatives for solving the problem. That individual elements of the claimed invention are disclosed in the prior art is not alone sufficient

to reach a conclusion of obviousness.

26. I also understand that when considering the obviousness of a patent Claim, one must consider whether a teaching, suggestion, or motivation to combine the references exists so as to avoid impermissibly applying hindsight when considering the prior art. I understand that a teaching, suggestion, or motivation may be found explicitly or implicitly: (1) in the prior art; (2) in the knowledge of those of ordinary skill in the art; or (3) from the nature of the problem to be solved. I also understand that the legal determination of the motivation to combine references allows recourse to logic, judgment, and common sense, but that any such motivation to combine references must still avoid the improper application of hindsight or reliance on the patentee's disclosure of his invention as found in the patent specification, drawings, and Claims. In a similar vein, I understand that one should consider whether a person of ordinary skill in the art would have had a reasonable expectation of success in achieving the purported invention.

27. I further understand that certain factors may support or rebut the obviousness of a Claim. I understand that such secondary considerations include, among other things, commercial success of the patented invention, skepticism of those having ordinary skill in the art at the time of the invention, unexpected results of the invention, any long-felt but unresolved need in the art that was satisfied by the alleged invention, the failure of others to make the alleged invention, praise of the

alleged invention by those having ordinary skill in the art, and copying of the alleged invention by others in the field. I understand that there must be a nexus—a connection—between any such secondary considerations and the alleged invention. I also understand that contemporaneous independent invention by others is a secondary consideration tending to show obviousness.

28. I understand that in determining whether a prior art reference would have been combined with other prior art or with other information within the knowledge of a person of ordinary skill in the art, the following are examples of approaches and rationales that may be considered:

- combining prior art elements according to known methods to yield predictable results;
- simple substitution of one known element for another to obtain predictable results;
- use of a known technique to improve similar devices in the same way;
- applying a known technique to a known device ready for improvement to yield predictable results;
- applying a technique or approach that would have been “obvious to try,” i.e., choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;

- known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to one of ordinary skill in the art;
- numerical ranges disclosed in the prior art that overlap with numerical limitations set forth in the challenged Claims;
- whether certain aspects of the patented subject matter were result-effective, such that a person of ordinary skill in the art would know that such element is determinative as to the effectiveness of the patent subject matter; and
- some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention. I understand that this teaching, suggestion or motivation may come from prior art references or from the knowledge or common sense of one of ordinary skill in the art.

29. I have been informed by counsel that the Board construes Claims according to the so-called “*Phillips*” standard. Under the *Phillips* standard, terms in a Claim are given their ordinary and customary meaning, consistent with the patent’s specification, as understood by a POSITA. I have been informed by counsel that

what is to be considered includes the Claims, the patent specifications and drawings, and the prosecution history, including any art listed by the examiner or the Applicant. I have been informed by counsel that information external to the patent, including expert and inventor testimony and unlisted prior art, are to be considered if ambiguities remain.

V. LEVEL OF ORDINARY SKILL IN THE ART

30. It is my understanding that a person of ordinary skill in the art (“POSITA”) is a hypothetical person who analyzes the prior art without the benefit of hindsight. I have been instructed that the level of ordinary skill may be reflected by the prior art of record, and that a person of ordinary skill in the art to which the claimed subject matter pertains would have the capability of understanding the scientific and engineering principles applicable to the pertinent art. I have been instructed that there are multiple factors that may be considered in determining the level of ordinary skill in the art, including: (1) type of problems encountered in the prior art; (2) prior art solutions to those problems; (3) rapidity with which innovations are made; (4) sophistication of the technology; and (5) educational level of active workers in the field. I also understand that a POSITA is also a person of ordinary creativity, not an automaton. They would be able to fit the teachings of multiple patents together like a puzzle and have the capability of understanding the scientific and engineering principles applicable to the pertinent art.

31. As stated in the '958 Patent, the “Technical Problem” to which the alleged invention is directed is providing “methods, apparatus, and techniques for more efficient transmission of system information blocks (SIBs).” EX. 1001 at 1:59–62. More specifically, the alleged information is “configured, upon a change of content of system information, to include, in a broadcast message comprising first system information which is broadcast from the access node, an indication of when the access node is scheduled to broadcast second system information which is not included in the first system information.” *Id.* at 2:2-11. In other words, the '958 Patent concerns systems and methods for reducing system overhead by making system information a configurable mix of broadcast and on-demand. The system broadcasts system information which says when the non-broadcast system information has changed, and the user equipment (UEs) receive a message indicating as such.

32. I have been asked to provide a definition for the level or ordinary skill in the art for a POSITA in the field of the '958 Patent at the time the priority application for the '958 Patent was filed. To that end, I have been asked to assume for purposes of this declaration that the '958 Patent is entitled to Claim priority to July 28, 2016, which corresponds to the filing date of U.S. Provisional Patent application 62/368,126.

33. In my opinion, a POSITA in reference to the '958 Patent would possess

(1) the equivalent of an undergraduate degree in Electrical Engineering or a related field; and (2) at least three years of experience in design, development, and/or testing of telecommunication systems. It is also my opinion that this definition is flexible in the sense that additional education (*e.g.*, a PhD in Electrical Engineering) could substitute for professional experience or *vice versa*.

34. I consider myself to have at least the credentials of a POSITA, and I am capable of addressing the issues from the perspective of such a person. As a result of my education, academic experience, and industrial experience, I am familiar with cellular networks, including the wireless standards on which they are based, and with the state of that technology on or around July 28, 2016.

35. All of my opinions in this declaration are from the perspective of a POSITA, as I have defined it above and during the relevant time frame.

VI. TECHNICAL BACKGROUND

36. Cellular systems have evolved over the last five decades. Roughly every 10 years corresponds to a new generation. First generation systems, roughly the 1980's, were based on analog transmission techniques (*e.g.* frequency modulation). Second generation systems, roughly the 1990s, employed digital modulation with forward error control. This reduced the necessary transmission power for a reliable connection. However, the connections in second generation cellular systems were circuit switched (a dedicated allocation of resources to a voice

call). Third generation cellular systems, roughly the 2000s, introduced packet switching as an option in order to provide access to an internet protocol (IP) based network. Third generation (3G) systems used signals based on code division multiple access (CDMA). Fourth generation systems, roughly the 2010s, are exclusively packeted switched using voice over IP (VOIP) to provide for voice calls. Fourth generation is also called Long Term Evolution (LTE). LTE is based on transmitting signals using orthogonal frequency division multiplexing (OFDM). LTE systems also used multiple input, multiple output (MIMO) configuration of antennas in order to increase the bandwidth efficiency, the bits per second per Hertz of bandwidth.

37. In cellular communications a base station (BS), also called an evolved Node B (eNB) in LTE, and user equipment (UE) communicate using radio frequency signals. Signals from a base station to a UE are called downlink transmissions while signals from a UE to a base station are called uplink signals. Cellular communication systems use two limited resources in order to provide connectivity of users to information networks. One resource is energy (from a battery in a cell phone). The other resource is frequency spectrum. Frequency spectrum is limited because it is allocated by the Federal Communication Commission for different applications.

38. In a cellular system different users need to be coordinated in order for transmissions from one user to not “collide” with another user. Because the users

are distributed geographically, coordinating the transmission of user information requires transmissions of control signals between the base station and the UE. There are many pieces of information that a UE needs in order to connect with a base station. This information includes scheduling information, the particular base station ID, a frequency band indicator that describes the spectrum being used by a particular base station, among many other pieces of information.

39. A protocol is used to provide the control signaling scheme as well as the signaling scheme for user data. Protocols are often divided into layers. The figure below shows the structure of the lowest layers in the WCDMA protocol. ETSI TS 125 201 V3.0.1 (2000-01).

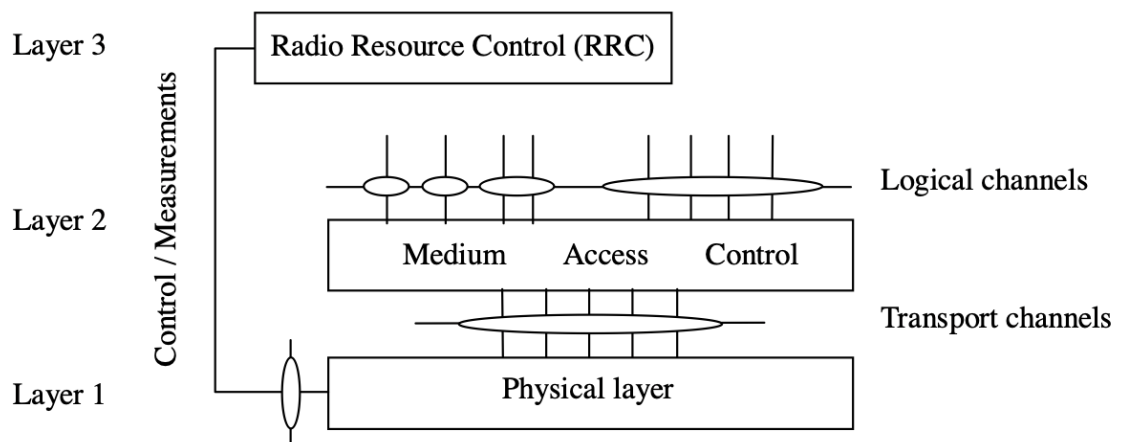


Figure 1 Radio interface protocol architecture around the physical layer

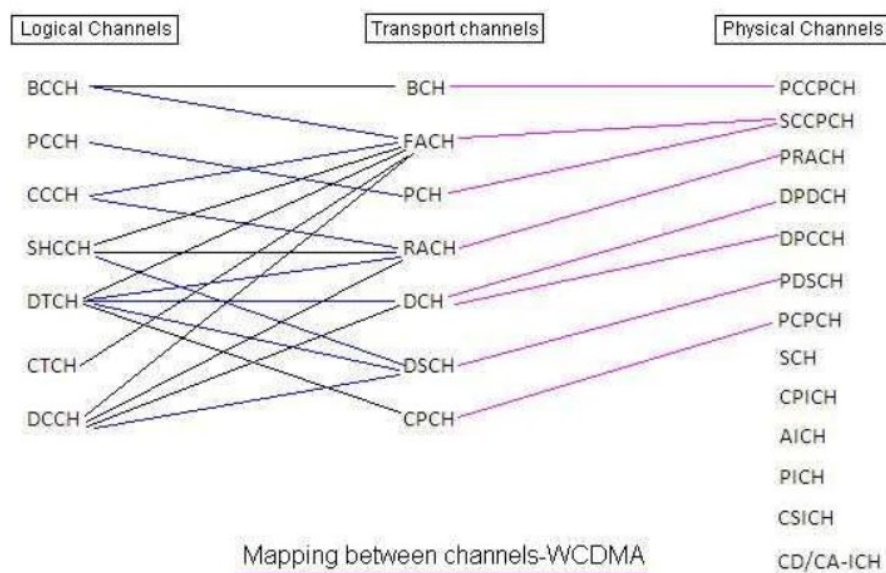
40. At the lowest layer, often called the physical layer or layer 1, mapping of data (control or user data) to signals is accomplished. The physical channels in

WCDMA include: P-CCPCH- Primary Common Control Physical Channel, SCH- Synchronization Channel, S-CCPCH- Secondary Common Control Physical Channel, PICH- Paging Indicator Channel, DPCH(DL)- Dedicated Physical Channel in the downlink, PDSCH- Physical Downlink Shared Channel, DPCH(UL)- Dedicated Physical Channel in the uplink, PUSCH- Physical Uplink Shared Channel, PRACH- Physical Random Access Channel, PNBSCH- Physical Node B Synchronization Channel

41. The medium access control (MAC) protocol in WCDMA and LTE is part of the second layer in the protocol stack and is responsible for scheduling of transmissions. The MAC protocol layers input are logical channels from which transport channels are generated and passed to the physical layer. Logical channels contain information of the same type (e.g. control information, user information). The next layer in the protocol stack is the Radio Link Control (RLC) layer. The next layer is the radio resource control (RRC) layer which includes the transmission of system information and connections of each UE to the network.

42. The system information in WCDMA and LTE is partitioned into various blocks. These include the master information block (MIB) and many different system information blocks (SIBs). Each SIB carries information with a particular function. In WCDMA and LTE System information block 1 (SIB1) contains information about cell selection, cell access and system information (SI)

scheduling. Continuous transmission of all SIBs would require a large use of spectral resources. Such use would reduce the spectral resources available for user data. The figure below shows for WCDMA how system information is mapped from logical channels to physical channels.¹



43. The '958 Patent relates to wireless communications, for example in a 5G cellular network, and in particular to “methods and apparatus for requesting, transmitting, and using system information (SI) in wireless communications.” EX. 1001 at 1:13-15. The 5G cellular network includes functionalities that are the same as the prior 4G and 3G networks, including the concept of SI. The following discusses SI updates and transmissions in more detail.

¹ See <https://www.rfwireless-world.com/Tutorials/UMTS-logical-transport-physical-channels.html>.

44. It was commonly known that when a cellular phone user first turns on a wireless device, the UE, which needs certain parameters or information about the network in order to connect and function. This information may be referred to as SI. After powering on, the UE acquires the SI that is required in order to be able to connect to the network, which may be referred to as the master information block (MIB). This information is repeatedly broadcast by all base stations (BS) in the network such that UEs may connect.

45. The MIB additionally included information related to where the UE can acquire additional pieces of SI it needs. For example, one type of information included on the MIB is SI block 1 (SIB1). The MIB includes the time and frequency scheduling information of a search space for the UE to monitor for SIB1. The UE scans the search space to find and receive a broadcast of SIB1. The UE requires both the MIB and SIB1 in order to connect to the network. The combination of MIB and SIB1 are the minimum or required SI needed.

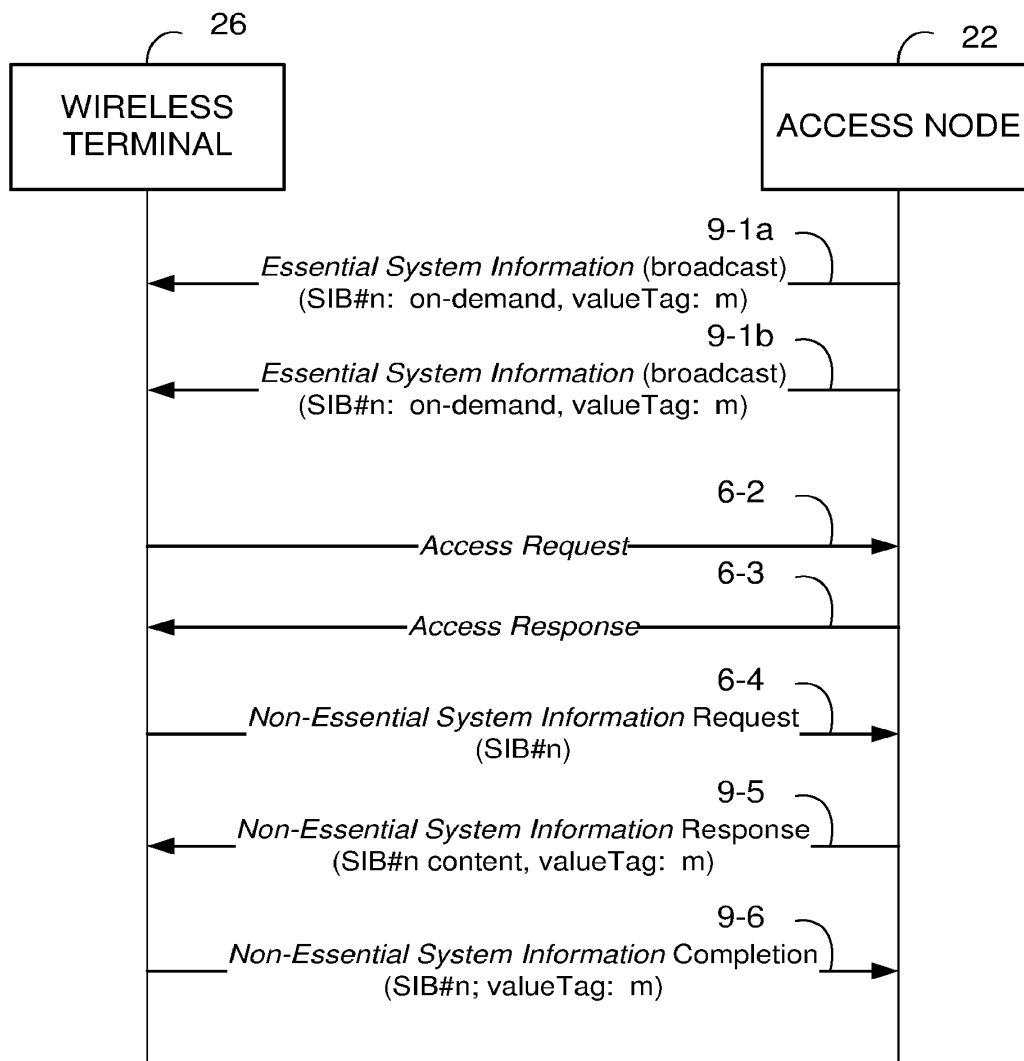
46. In addition to the required SI, there are other SIBs in the network, for example SIB2, SIB3...SIBn. The UE will likely need some, but not all, of these additional SIBs. The additional SIBs are each associated with a value tag. A value tag is an integer which is updated to indicate that information related to the SIB has changed. The UE needs to know when these SIBs change in order to ensure it has the most up-to-date system information for remaining connected to the network.

47. When there is an SI update, the 5G network may broadcast a notification to all UEs. This notification may be a paging message. When the UE receives the notification, the UE may then reacquire the changed SI in order to remain connected to the network.

VII. OVERVIEW OF THE '958 PATENT

48. The '958 Patent is titled “Access Node, a Method for an Access Node, a Wireless Terminal and a Method for a Wireless Terminal.” As noted above, the alleged invention relates to requesting, transmitting and using SI in wireless communications.

49. For example, the '958 Patent describes classifying a first type of system information comprising “essential” system information, and a second type of system information comprising “non-essential” system information. *See, e.g.*, EX. 1001 at 8:34-46. The essential SI is required by the wireless terminal for initial access to the radio access network, and the non-essential SI is all information not required for the initial access. *Id.* The '958 Patent discloses periodically transmitting (broadcasting) the first type SI (comprising the essential SI), and providing the second type SI (comprising the non-essential SI) on-demand. This SI transmission procedure is depicted in Figure 9, which is reproduced below.

*Fig. 9*

EX. 1001 at Fig. 9.

50. As reflected in the figure reproduced above, and further explained in the '958 Patent, the access node first transmits the essential system information on SIB1 (9-1a,9-1b). The access node then transmits non-essential system information on SIB2 (9-5) in response to a non-essential system information request (6-4). *See, e.g.,* EX. 1001 at Fig. 9.

51. The '958 Patent also discloses that the essential system information messages (9-1a and 9-1b in Fig. 9 above), include amongst other things, a value tag. *Id.* at 11:51-63. When this value tag is changed, indicating that the non-essential system information has been changed, the non-essential system information is then transmitted.

52. The alleged invention of the '958 Patent merely combines the background concepts from the prior art included in this declaration. Claim 3, exemplary of the '958 alleged invention, is reproduced below.

3. A method for an access node of a radio access network that communicates over a radio interface with a wireless terminal, the method comprising:

generating a first type system information block (SIB) comprising information and a value tag, the information indicating whether one or more associated second type system information blocks are provided by broadcast or on-demand, the value tag being updated upon a change of a corresponding second type SIB, the first

type SIB being required for the wireless terminal to perform an initial access to the radio access network; upon a change of a second type SIB whose associated information indicated before the change that the second type SIB was provided on-demand, including in the first type SIB the information associated with the second type SIB indicating that the second type SIB is provided by broadcast;

transmitting the first type SIB;

transmitting a message that triggers the wireless terminal to receive the first type SIB, wherein; whether or not the second type SIB has changed is determined based on a value tag, associated with the second type SIB, stored in the wireless terminal, and the value tag included in the first type SIB corresponding to the second type SIB.

EX. 1001 at Claim 3.

VIII. CLAIM CONSTRUCTION

53. I have been told that Claim terms in an *inter partes* review proceeding are to be given their ordinary and accustomed meaning as understood by a person of

ordinary skill in the art. In my analysis of the Challenged Claims, I have applied the plain and ordinary meaning as understood by a person of ordinary skill in the art at the relevant time. In my analysis, it was not necessary to construe any terms because all limitations in the '958 Patent are disclosed in the prior art under any reasonable interpretation of the Claim terms.

IX. PRIOR ART

A. Lee

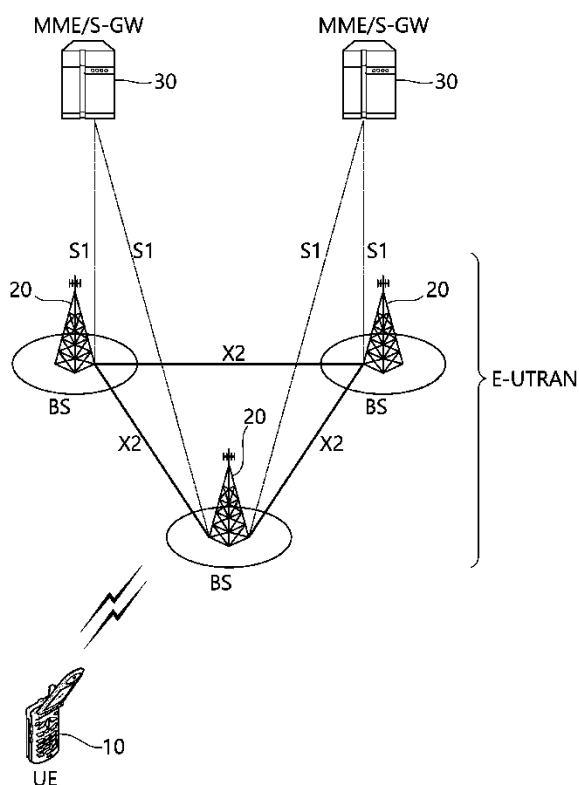
1. Overview of Lee

54. Lee is directed to cellular communication systems. EX. 1004 at [0003]. Lee generally discloses techniques for “requesting a system information block,” particularly for requesting missing system information. This method includes, for example, “receiving, from the RAN, SIB broadcast information indicating whether the SIB supported by the cell is broadcast in a broadcast control channel (BCCH) section; detecting an omitted SIB on the basis of the SIB list and SIB broadcast information; and requesting the omitted SIB from the RAN.” *Id.* at Abstract.

55. The cellular network of Lee includes a radio access network that transmits system information blocks (SIBs) to user equipment. *Id.* at Abstract. This is shown in Figure 1 of Lee, reproduced below. In this figure the E-UTRAN (Evolved UMTS Terrestrial Radio Access Network) consists of base stations (20) that use wireless transmission to communicate via a radio interface with a cell phone

(10).

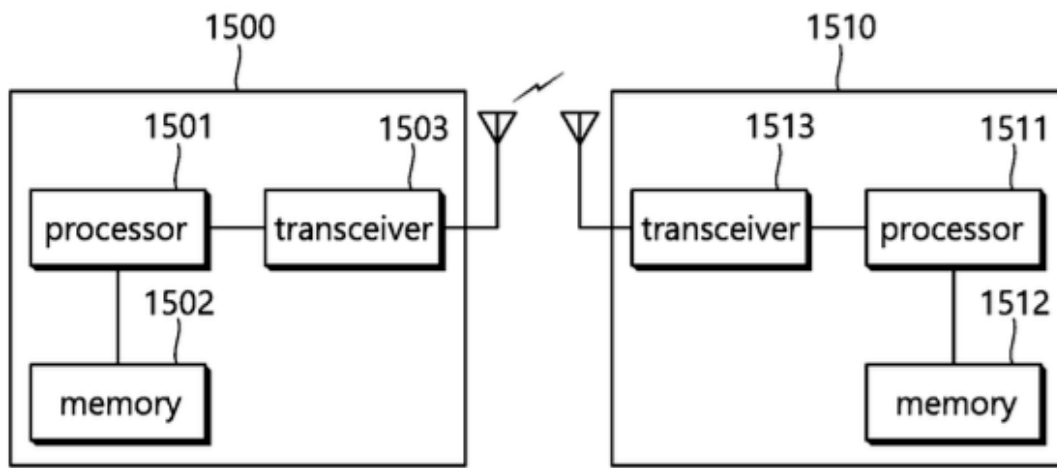
FIG. 1



Id. at Figure 1.

56. Figure 15 of Lee, reproduced below, shows the components of a base station (1500) and user equipment (1510). *Id.* at [0183]. The base station includes a processor (1501), a transceiver (1503) and memory (1502). *Id.* at [0184]. “The transceiver 1503 is connected to the processor 1501, and transmits and/or receives radio signals.” *Id.* “The user equipment includes a processor (1511), a transceiver

(1513) and memory (1512).” *Id.* at [0185]. “The transceiver 1513 is connected to the processor 1511, and transmits and/or receives radio signals.” *Id.* As shown in Figure 15 below, there is an antenna connected to the base station and the UE. The signals propagate from one antenna to the other antenna. The processors in 1500 and 1510 use instructions stored in memory to carry out the desired function of the cellular network. *Id.* at [0184]. Processors in cellular base stations and phone are implemented using digital circuits.



Id. at Figure 15.

57. 8. Lee describes the goal of obtaining higher data transfer rates in a 5G system. As described in Lee, the problem with the LTE system is that “as the number of system information blocks grows, the quantity of radio resources required to broadcast a SI system information block also inevitably increases...To transmit

continuously increase system information to a user equipment (UE), it is necessary to propose a method for acquiring system information that efficiently utilizes the radio resources.” EX. 1004 at [0008].

58. To solve this problem, Lee proposes a method that more efficiently transmits SIBs. There are various methods described to more efficiently transmit SIBs. As in LTE, Lee discloses multiple SIBs. “The SIB is subdivided into SIB-x forms according to its importance or cycle.” EX. 1004 at [0007]. “There are different types of SIBs.” *Id.* at [0070]. “SIB1 includes pieces of information associates with cell access, and particularly includes scheduling information on other SIBs (SIB2 to SIBn) than SIB1.” In addition, “SIB2 includes necessary information for a UE to access a cell.” *Id.* at [0072]. The information in SIB2 includes the bandwidth of the uplink cell and an uplink power control parameter. As such, it is essential for a UE to connect to a base station that SIB1 be received by the UE. The SIB1 is transmitted by broadcasting to UEs using the downlink shared channel (DL-SCH). *Id.* at [0071]. Since SIB2 is essential for a UE to connect and the scheduling information for SIB2 is contained in SIB1, SIB1 is also essential for a UE to connect with a base station.

59. Lee describes a more efficient method of transmitting system information. “The new type of system information is not always broadcast by a network but may be transmitted from the network only when a UE request the system

information. This type of system information may be referred to as an on-demand system information (OSI) or minimum system information (MSI).” *Id.* at [0101].

60. Lee describes the motivation for the invention as “Regarding on-demand system information, a UE may request system information in a cell, and a network receiving the request may transmit the requested system to the UE. However, when the UE frequently requests system information, an uplink may become very congested. Therefore, it is necessary to newly propose a system information request procedure for minimizing up link congestion when a UE requests system information.” *Id.* at [0102].

61. Lee differentiates between types of SIBs. In particular, Lee introduces a first type SIB (SIB1) which includes information associated with cell access, and specifically includes scheduling information on other SIBs. *Id.* at [0071]. SIBs with the same transmission periodicity (among the other SIBs) are transferred via the same SI message, such that scheduling information includes a mapping relationship between each SIB and an SI message. *Id.* Scheduling information includes information such as the duration of an SI window and an SI transmission periodicity. *Id.* SIB1 is broadcast through a downlink shared channel (DL SCH). *Id.*

62. Lee classifies additional types of SIBs. The table below maps the different SIBs Lee describes, with a description of the included information.

SIB	Included Information	Lee’s Disclosure
-----	----------------------	------------------

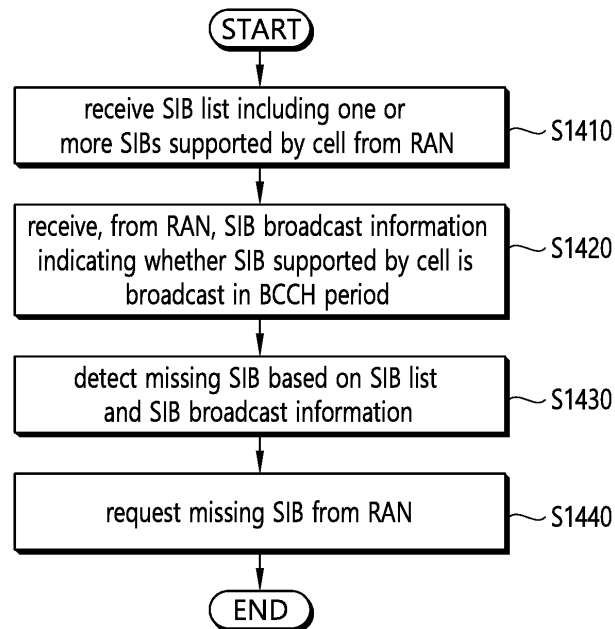
SIB1	SIB1 includes information associated with cell access, including scheduling information for the other SIBs.	[0071]
SIB2	SIB2 includes necessary information for a UE to access a cell. This necessary information includes information on an uplink cell bandwidth, a random access parameter, and an uplink power control parameter.	[0072]
SIB3	SIB3 includes cell reselection information.	[0073]
SIB4	SIB4 includes frequency information on a serving cell and intrafrequency information on a neighboring cell for cell reselection.	[0073]
SIB5	SIB5 includes frequency information on a different E-UTRA and inter-frequency information on a neighboring cell for cell reselection.	[0073]
SIB6	SIB6 includes frequency information on a UTRA and information on a UTRA neighboring cell for cell reselection.	[0073]
SIB7	SIB7 includes frequency information on a GERAN for cell reselection.	[0073]
SIB8	SIB8 includes information on a neighboring cell.	[0073]
SIB9	SIB9 includes a Home eNodeB (HeNB) identifier.	[0074]
SIB10	SIB10-12 includes a public warning message. For example, SIB10-12 may include an earthquake warning.	[0074]
SIB11		
SIB12		

SIB14	SIB14 supports enhanced access barring and controls UE's cell access.	[0074]
SIB15	SIB15 includes information needed to receive an MBMS at contiguous carrier frequencies.	[0074]
SIB16	SIB16 includes GPS time and coordinated universal time related information.	[0074]
SIB17	SIB17 includes RAN auxiliary information.	[0074]

63. Lee explains that UEs need to maintain up-to-date system information when accessing a cell, and that when system information is changed, the UEs need to know in advance the time that the BS will transmit the new system information. *Id.* at [0076]. Lee teaches, for example, that when a network changes a particular type of on-demand system information, the network may broadcast the changed system information during a specific period. *Id.* at [0167]. Lee discloses a system whereby certain information may be requested by the UE “on-demand” as opposed to broadcast. Lee discloses that “the network may indicate to the UE whether on-demand system information is broadcast in the next period (e.g., the next modification period). When the network intends to broadcast on-demand system information in the next period, the network may indicate to the UE whether all system information is broadcast or only changed on-demand system information is broadcast.” *Id.* at [0168].

64. Lee describes a method in which a UE requested an SIB, a diagram for which is depicted in Figure 14, which is reproduced below:

FIG. 14



Id. at Fig. 14, [0171].

65. At step S1410, the UE receives an SIB list including one or more SIBs supported by a cell from a RAN. *Id.* at [0173]; Fig. 14.

66. At step S1420, the UE receives from the RAN, SIB broadcast information indicating whether an SIB supported by the cell is broadcast in a BCCH period. *Id.* at [0174]; Fig. 14.

67. At step S1430, the UE detects a missing SIB based on the SIB broadcast information. *Id.* at [0175]. The missing SIB may be an SIB not broadcasted in the BCCH period. *Id.* at [0176]. Further, the missing SIB may be an SIB that the UE needs to receive in order to perform a particular function or service. *Id.* at [0177].

68. At step S1440, the UE requests the missing SIB from the RAN. *Id.* at [0178]. The UE may receive the missing SIB in response to this request.

69. Lee additionally discloses that the UE receives a value tag indicating system information to be requested from the RAN. *Id.* at [0180]. Value tags are pieces of information transmitted by an eNB that inform the UE that there is a change in an SIB. For example, a value tag sent in SIB1 could indicate the current version of SIB2. So, when SIB2 changes, a value tag sent in SIB1 would be changed. Lee discloses that the system information includes a value tag that indicates “system information to be transmitted when the UE requests system information.” *Id.* at [0134]. “The UE may receive, from the RAN, a value tag indicating system information to be requested from the RAN.” *Id.* at [0180].

70. Lee further discloses that the network may broadcast all system information, or the changed on-demand system information without a request by the UE. *Id.* at [0168]. The UE may check whether on-demand system information has changed, for example, based on the value tag changing. *Id.* at [0169].

71. Lee teaches that when the UE recognizes that the on-demand system information is changed, and that the on-demand system information is not scheduled to be broadcast, then the UE may request the on-demand system information. *Id.* at [0170]. In an instance where the on-demand system information is changed, but it is scheduled to be broadcast, the UE does not need to request the on-demand system information. *Id.* When the network broadcasts only the changed on-demand system information, if the UE requires a particular type of unchanged information, it may request that particular information. *Id.*

72. In the system disclosed by Lee, information can be requested by the UE, so-called “on-demand” information, or the “on-demand” information can be broadcast to all users in the case that multiple users would have use of that information. By broadcasting this information, the resources used on the uplink (the resources that would have been necessary for each UE to request the information) is reduced.

2. Lee is Entitled to its Provisional Filing Date

73. I understand that Lee Claims priority to U.S. Prov. App. Nos. 62/334,418 filed on May 10, 2016, No. 62/334,427 filed on May 10, 2016, No. 62/334,443 filed on May 10, 2016, and No. 62/366,643 filed on Jul. 26, 2016. *Id.*

74. I have been informed by counsel and understand that because the filing dates of each of the four Provisionals which Lee Claims priority to are before July

28, 2016, Lee is considered prior art if the subject matter relied upon from Lee is supported by Lee's earlier priority applications.

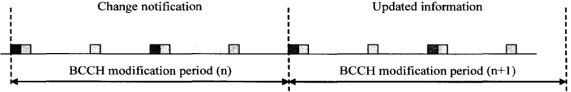
75. It is my opinion that the subject matter relied upon from Lee in my analysis below is supported in the Lee Provisional Applications, as shown in the table below.

Subject Matter from EX. 1004 Cited in Analysis Below	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006) ²
[0009] According to an embodiment, there is provided a method for requesting, by a user equipment (UE), a system information block (SIB) in a wireless communication system. The method may include: receiving an SIB list including one or more SIBs supported by a cell from a radio access network (RAN); receiving, from the RAN, SIB broadcast information indicating whether an SIB supported by the cell is broadcast in a broadcast control channel (BCCH) period; detecting a missing SIB based on the SIB list and the SIB broadcast information; and requesting the missing SIB from the RAN.	“Upon detecting a missing SIB that a UE should read e.g. due to a supported feature such as MBMS, D2D, V2X, or WLAN, UE sends SI request. The SI request indicates the missing SIB which is listed in the broadcast system information but not scheduled/broadcast in the current or the next BCCH period.” p. 37 ³
[0041] Referring to FIG. 1, the LTE system architecture includes one or more user equipment (UE; 10), an evolved-UMTS terrestrial radio access network (E-UTRAN) and an evolved packet core (EPC). The UE 10 refers to a communication equipment carried by a user. The UE 10 may be fixed or mobile, and may be referred to as another terminology, such as a mobile station (MS), a user terminal (UT), a subscriber station (SS), a wireless device, etc.	“The E-UTRAN may include one or more evolved NodeB (eNodeB) 20, and a plurality of user equipment (UE) 10 may be located in one cell. One or more E-UTRAN mobility management entity (MME)/system architecture evolution (SAE) gateways 30 may be positioned at the end of the network and connected to an external network.” p. 39

² U.S. Provisional Patent Application No. 62/334,418 (Ex-1004, “Lee Provisional”).

³ Citations are to the page numbers in Lee Provisional.

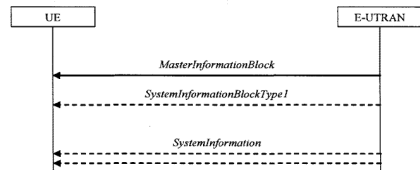
Subject Matter from EX. 1004 Cited in Analysis Below	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006) ²
[0042] The E-UTRAN includes one or more evolved node-B (eNB) 20, and a plurality of UEs may be located in one cell. The eNB 20 provides an end point of a control plane and a user plane to the UE 10. The eNB 20 is generally a fixed station that communicates with the UE 10 and may be referred to as another terminology, such as a base station (BS), a base transceiver system (BTS), an access point, etc. One eNB 20 may be deployed per cell. There are one or more cells within the coverage of the eNB 20. A single cell is configured to have one of bandwidths selected from 1.25, 2.5, 5, 10, and 20 MHz, etc., and provides downlink or uplink transmission services to several UEs. In this case, different cells can be configured to provide different bandwidths. [0041]-[0042]	“An eNodeB 20 provides end points of a user plane and a control plane to the UE 10.” p. 40 “The eNodeB 20 is generally a fixed station that communicates with a UE 10, and may also be referred to as a base station (BS) or an access point.” p. 40
[0071] SIB1 includes pieces of information associated with cell access, and particularly includes scheduling information on other SIBs (SIB2 to SIBn) than SIB1. SIBs having the same transmission periodicity among the SIBs other than SIB1 are transferred via the same system information (SI) message. Thus, scheduling information includes a mapping relationship between each SIB and an SI message. An SI message is transmitted within an SI window in a time domain, and each SI message is associated with one SI window. Since SI windows for different pieces of SI do not overlap, only one SI message is transmitted within an SI window. Thus, scheduling information includes the duration of an SI window and an SI transmission periodicity. Time/frequency for transmitting an SI message is determined by dynamic scheduling by a BS. SIB1 is broadcast through a downlink shared channel (DL SCH) according to a periodicity of eight radio frames (that is, 80-ms periodicity), and SIB1 is repeatedly retransmitted on a fifth subframe of an SFN-mod-2 radio frame within the 80-ms periodicity. [0072] SIB2 includes necessary information for a UE to access a cell. SIB2 includes information on an uplink cell bandwidth, a random access parameter, and an uplink power control parameter. [0071]-[0072]	“SIBs other than <i>SystemInformationBlockType1</i> are carried in <i>SystemInformation</i> (SI) messages and mapping of SIBs to SI messages is flexibly configurable by <i>schedulingInfoList</i> included in <i>SystemInformationBlockType1</i>, with restrictions that: each SIB is contained only in a single SI message, and at most once in that message; only SIBs having the same scheduling requirement (periodicity) can be mapped to the same SI message; <i>SystemInformationBlockType2</i> is always mapped to the SI message that corresponds to the first entry in the list of SI messages in <i>schedulingInfoList</i>. There may be multiple SI messages transmitted with the same periodicity. <i>SystemInformationBlockType1</i> and all SI messages are transmitted on DL-SCH.”

Subject Matter from EX. 1004 Cited in Analysis Below	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006) ²
	p. 2 “RAN may broadcast only one or more of the master information block and the system information blocks from Type 1 to Type N while not broadcasting the system information blocks from Type N to Type M. N can be a system information type number lower than or equal to M.” p. 34
[0076] System information is commonly applied to all UEs accessing a cell, and UEs need to always maintain up-to-date system information to perform an appropriate operation. When system information is changed, UEs need to know in advance the time the BS transmits new system information. In order that a BS and a UE mutually recognize a radio frame period for transmitting new system information, the concept of BCCH modification period is introduced in “3GPP TS 36.331 v9. 3.0,” which is described in detail. [0077] FIG. 4 shows an update of system information. [0078] Referring to FIG. 4, a BS, which intends to update system information in an (n+1)th modification period, notifies in advance UEs of an update of system information in an nth modification period. A UE, which is notified the update of the system information in the nth modification period, receives and applies new system information at the very beginning of the (n+1)th modification period. When an update of system information is scheduled, the BS includes a system information modification indicator in a paging message. Generally, a paging message is a message received by an idle-mode UE. However, since an update of system information is notified through a paging message, a connected-mode UE also needs to receive a paging message at times and to identify an update of system information. [0076]-[0078]	 Figure 5.2.1.3-1: Change of system information p. 4 “The Paging message is used to inform UEs in RRC IDLE and UEs in RRC CONNECTED about a system information change. If the UE is in RRC CONNECTED or uses a DRX cycle shorter than or equal to the modification period, and receives a Paging message including the <i>systemInfoModification</i>, it knows that the system information will change at the next modification period boundary. If a UE in RRC IDLE uses a DRX cycle longer than the modification period, and the notification is received in a Paging message including the <i>systemInfoModification-eDRX</i>, it acquires the updated system

Subject Matter from EX. 1004 Cited in Analysis Below	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006) ²
	information at the next eDRX acquisition period boundary.” p. 4 “The supported SIB can be listed in a certain system information (e.g. MIB or SIB Type 1) which is always broadcast. The system information broadcast in a BCCH period includes a list of supported SIBs and indicates whether the supported SIBs are scheduled/broadcast or not in the current or the next BCCH period in which system information is periodically broadcast. The BCCH period can be either BCCH modification period or BCCH repetition period.” p. 37 “When the network changes a certain type of on-demand system information, the network broadcasts all or the changed on-demand system information during a certain period (e.g. modification period). The period can be configured in master system information or any essential system information.” p. 37 “The network indicates the system information is to be changed by broadcast signaling (e.g. essential system information or paging message)

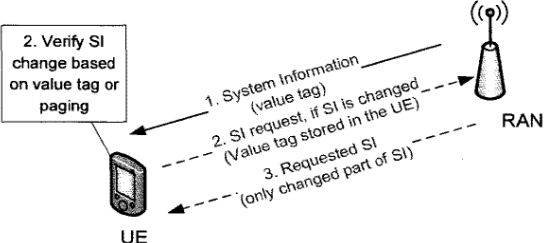
Subject Matter from EX. 1004 Cited in Analysis Below	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006) ²
	during a certain period (e.g. modification period). The indication can be common for all SI or per SL.” p. 37 “The above change indication further includes whether the network broadcasts the on-demand SI in the next period (modification period). If the network is intended to broadcast on-demand SI in the next modification period, the network further indicates whether all or only changed SI is broadcasted in the above change indication.” p. 37
[0083] After completing the modification period in which the paging is received, the UE receives SIB1 information to receive new SIB information (S504). There are several types of SIBs depending on purposes. SIB1 to SIB14 exist in Rel-11 LTE technology, and SIBs are continuously developed to support new functions of standard technologies. Among different SIBs, SIB1 may include scheduling information on other SIBs. Therefore, SIB1 needs to be received first in order to receive other SIB information. [0083]	“<i>SystemInformationBlockType1</i> configures the SI-window length and the transmission periodicity for the SI messages.” p. 3 “Upon receiving a change notification, the UE using a DRX cycle that is smaller than or equal to the modification period acquires the new system information immediately from the start of the next modification period. Upon receiving a change notification applicable to eDRX, a UE in RRC IDLE using a DRX cycle that is longer than the modification period acquires the updated system information

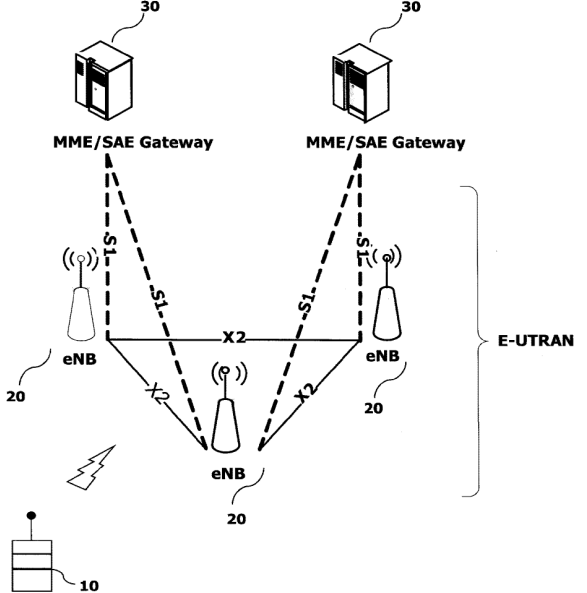
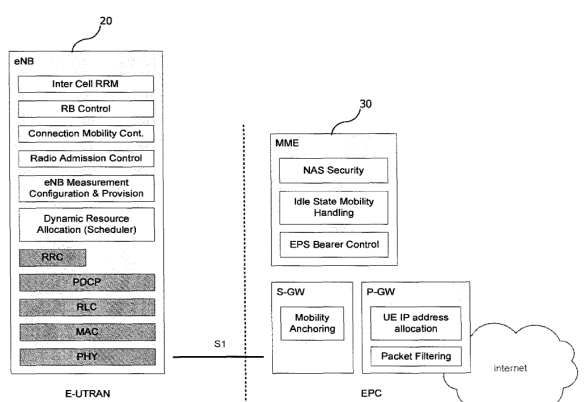
Subject Matter from EX. 1004 Cited in Analysis Below	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006) ²
	immediately from the start of the next eDRX acquisition period.” p. 3 “The Paging message is used to inform UEs in RRC IDLE and UEs in RRC CONNECTED about a system information change. If the UE is in RRC CONNECTED or uses a DRX cycle shorter than or equal to the modification period, and receives a Paging message including the systemInfoModification, it knows that the system information will change at the next modification period boundary.” p. 4 “<i>SystemInformationBlockType1</i> includes a value tag, <i>systemInfoValueTag</i>, that indicates if a change has occurred in the SI messages.” p. 4 “The UE is not required to periodically check <i>schedulingInfoList</i> contained in <i>SystemInformationBlockType1</i>, but Paging message including the <i>etws-Indication</i> triggers the UE to reacquire <i>schedulingInfoList</i> contained in <i>SystemInformationBlockType1</i> for scheduling changes for <i>SystemInformationBlockType10</i> and <i>SystemInformationBlockType11</i>”

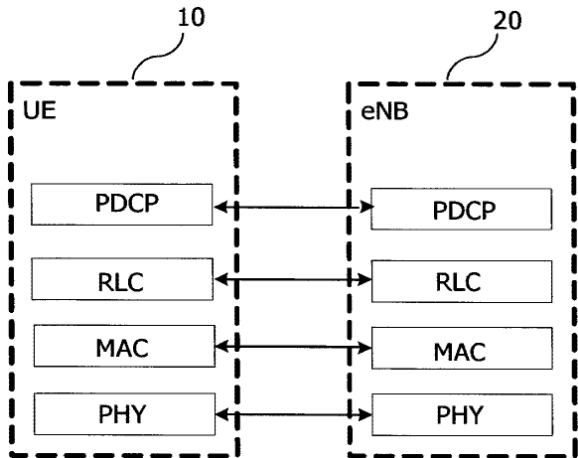
Subject Matter from EX. 1004 Cited in Analysis Below	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006) ²
	p. 5 “Upon receiving the Paging message, the UE shall: ... 1 > if the systemInfoModification is included; ... 2> re-acquire the required system information using the system information acquisition procedure as specified in 5.2.2.” p. 20 1.1.2 5.2.2 System information acquisition 1.1.2.1 5.2.2.1 General  <pre> sequenceDiagram participant UE participant EUTRAN as E-UTRAN UE->>EUTRAN: MasterInformationBlock EUTRAN-->>UE: SystemInformationBlockType1 UE-->>EUTRAN: SystemInformation </pre> Figure 5.2.2.1-1: System information acquisition, normal p. 6. “The UE shall: 1 > ensure having a valid version, as defined below, of (at least) the following system information, also referred to as the 'required' system information: 2> if in RRC_IDLE: 3> the MasterInformationBlock and SystemInformationBlockType1 (or

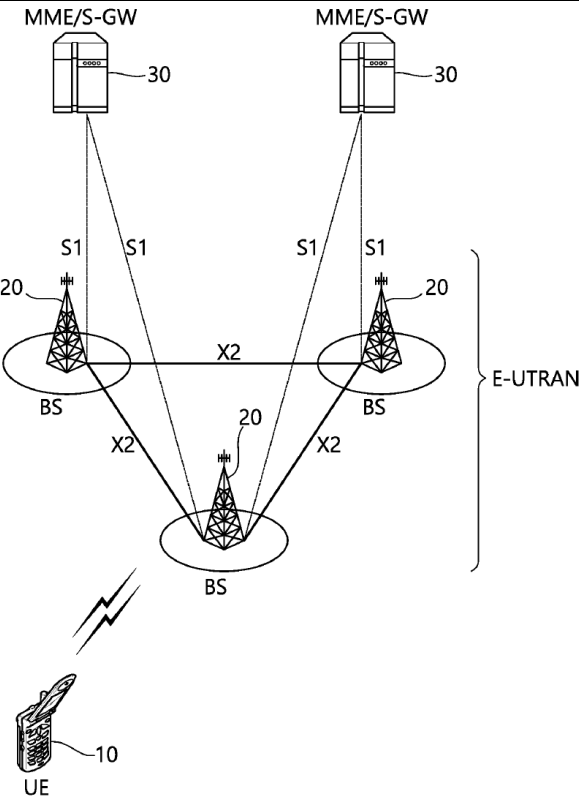
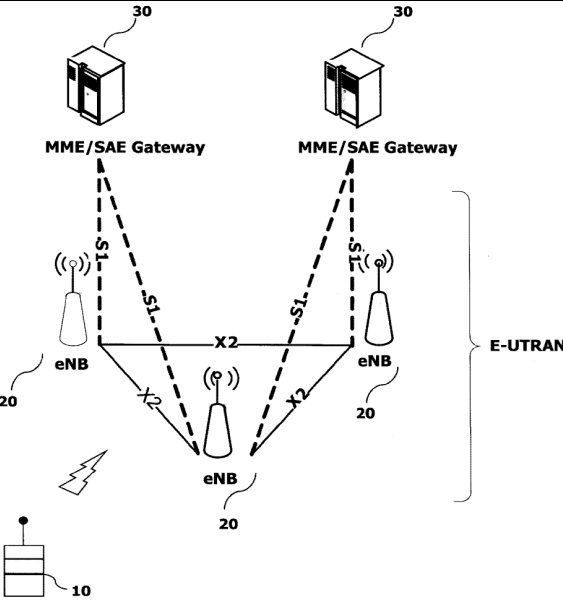
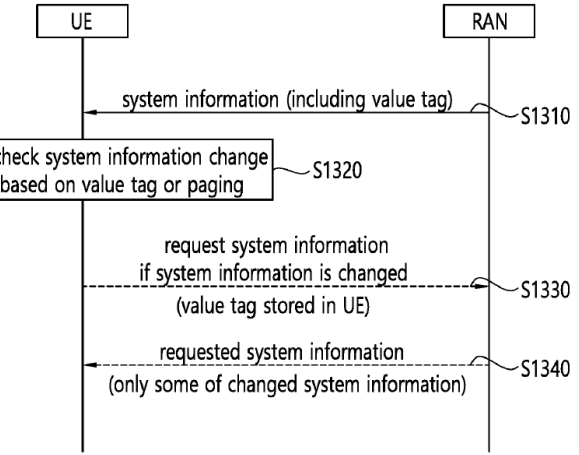
Subject Matter from EX. 1004 Cited in Analysis Below	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006) ²
	SystemInformationBlockType1-BR depending on whether the UE is a BLUE or the UE in CE) as well as SystemInformationBlockType2 through SystemInformationBlockTypeB (depending on support of the concerned RATs), SystemInformationBlockType17 (depending on support of RAN-assisted WLAN interworking); ... 1>consider any stored system information except SystemInformationBlockType10, SystemInformationBlockType11, systemInformationBlockType12 and systemInformationBlockType14 to be invalid if systemInfoValueTag included in the SystemInformationBlockType1 is different from the one of the stored system information and in case of BLUEs and UEs in CE, systemInfoValueTagSI is not broadcasted. Otherwise consider system information validity as defined in 5.2.1.3” pp. 6-7. pp. 11-16 (providing procedures for UE actions upon receiving SystemInformationBlock2 – SystemInformationBlock20).

Subject Matter from EX. 1004 Cited in Analysis Below	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006) ²
[0166] FIG. 13 illustrates a procedure in which a UE requests changed system information when system information is changed according to an embodiment of the present invention. [0167] When a network changes a particular type of on-demand system information, the network may broadcast the changed system information or all system information during a specified period. For example, the specified period may be a modification period. The specified period may be set in master system information or any necessary system information. [0168] Referring to FIG. 13, in step S1310, the network may indicate to the UE that on-demand system information is to be changed by broadcast signaling during a specified period. For example, the broadcast signaling may be essential system information or a paging message. This indication may include a value tag for a particular type of system information or a common value tag for all system information. Additionally, the network may indicate to the UE whether on-demand system information is broadcast in the next period (e.g., the next modification period). When the network intends to broadcast on-demand system information in the next period, the network may indicate to the UE whether all system information is broadcast or only changed on-demand system information is broadcast. Regardless of on-demand system information, the network may broadcast all system information or changed on-demand system information without a request by the UE. [0169] In step S1320, the UE may check whether the on-demand system information is changed. For example, the UE may determine whether the on-demand system information is changed based on the value tag. For example, the UE may determine whether the on-demand system information is changed based on the paging message. [0170] In step S1330, when the UE recognizes that the on-demand system information is changed and the on-demand system information is not scheduled to be broadcast, the UE may trigger a system information request for the on-demand system information. On the other hand, when the UE recognizes that the on-demand system information is changed and the on-demand system information is scheduled to be broadcast, the UE may not trigger a system information request for the on-demand system information.	“The supported SIB can be listed in a certain system information (e.g. MIB or SIB Type 1) which is always broadcast. The system information broadcast in a BCCH period includes a list of supported SIBs and indicates whether the supported SIBs are scheduled/broadcast or not in the current or the next BCCH period in which system information is periodically broadcast. The BCCH period can be either BCCH modification period or BCCH repetition period.” p. 37 “When the network changes a certain type of on-demand system information, the network broadcasts all or the changed on-demand system information during a certain period (e.g. modification period). The period can be configured in master system information or any essential system information.” p. 37 “The network indicates the system information is to be changed by broadcast signaling (e.g. essential system information or paging message) during a certain period (e.g.

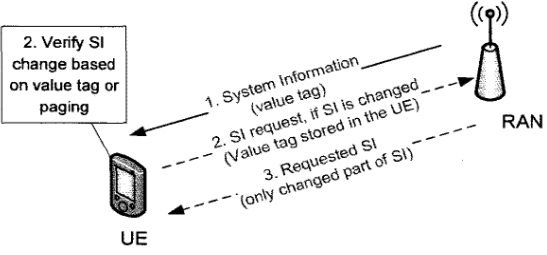
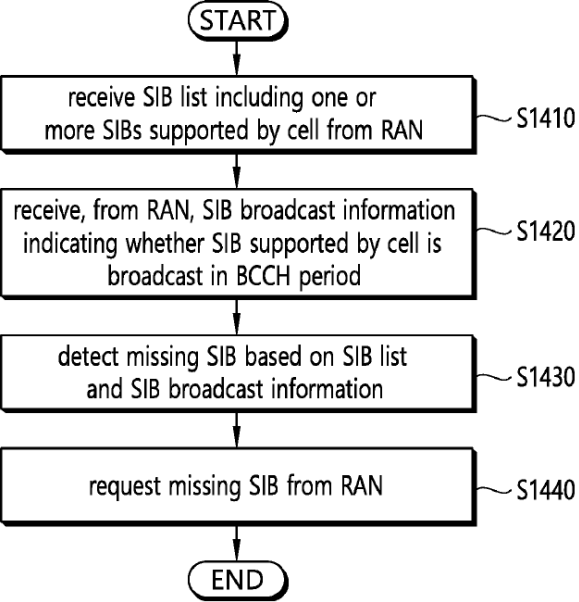
Subject Matter from EX. 1004 Cited in Analysis Below	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006) ²
When the network broadcasts only the changed on-demand system information but the UE requires a particular type of system information that is different from the changed on-demand system information, the UE may trigger a system information request for the particular type of system information. Additionally, when the UE triggers a system information request, the value tag stored in the UE may be transmitted to an RAN. [0166]-[0170]	modification period). The indication can be common for all SI or per SL.” p. 37 “The above change indication further includes whether the network broadcasts the on-demand SI in the next period (modification period). If the network is intended to broadcast on-demand SI in the next modification period, the network further indicates whether all or only changed SI is broadcasted in the above change indication.” p. 37  The diagram illustrates the process of a UE requesting system information from a RAN. It shows a UE (User Equipment) and a RAN (Radio Access Network) with an antenna. The process is numbered 1 through 3: 1. System Information (value tag) - A solid arrow points from the RAN to the UE. 2. SI request, if SI is changed (Value tag stored in the UE) - A dashed arrow points from the UE to the RAN. 3. Requested SI (only changed part of SI) - A dashed arrow points from the RAN to the UE. p. 38
[0184] A BS 1500 includes a processor 1501, a memory 1502 and a transceiver 1503. The memory 1502 is connected to the processor 1501, and stores various types of information for driving the processor 1501. The transceiver 1503 is connected to the processor 1501, and transmits and/or receives radio signals. The processor 1501 implements proposed functions, processes and/or methods. In the above embodiment, an operation of the BS may be implemented by the processor 1501.	“As illustrated in FIG. 1, the E-UMTS network includes an evolved UMTS terrestrial radio access network (E-UTRAN), an Evolved Packet Core (EPC) and one or more user equipment.” p. 39.

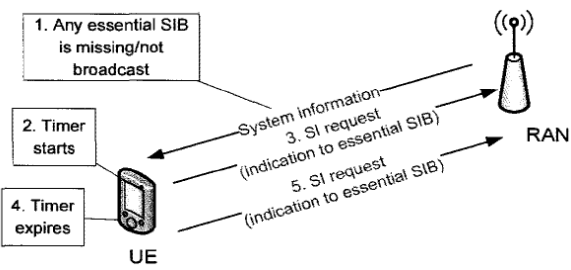
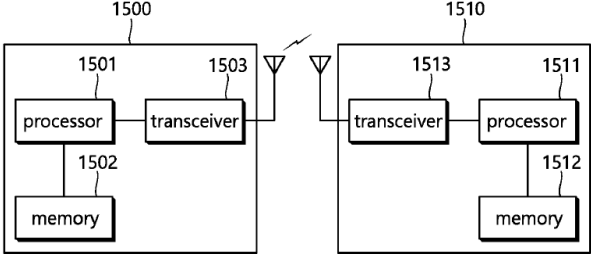
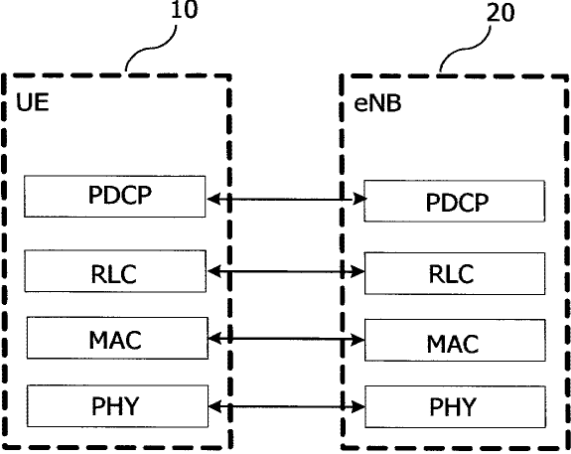
Subject Matter from EX. 1004 Cited in Analysis Below	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006) ²
[0185] A UE 1510 includes a processor 1511, a memory 1512 and a transceiver 1513. The memory 1512 is connected to the processor 1511, and stores various types of information for driving the processor 1511. The transceiver 1513 is connected to the processor 1511, and transmits and/or receives radio signals. The processor 1511 implements proposed functions, processes and/or methods. In the above embodiment, an operation of the UE may be implemented by the processor 1511. [0186] The processor may include an application-specific integrated circuit (ASIC), a separate chipset, a logic circuit, and/or a data processing unit. The memory may include a read-only memory (ROM), a random access memory (RAM), a flash memory, a memory card, a storage medium, and/or other equivalent storage devices. The transceiver may include a base-band circuit for processing a wireless signal. When the embodiment is implemented in software, the aforementioned methods can be implemented with a module (i.e., process, function, etc.) for performing the aforementioned functions. The module may be stored in the memory and may be performed by the processor. The memory may be located inside or outside the processor, and may be coupled to the processor by using various well-known means.	 p. 49 “FIG. 2 is a block diagram depicting architecture of a typical E-UTRAN and a typical EPC.” p. 40.
[0184]-[0186]	 p. 50. “As illustrated in FIG. 3(a), the RLC and MAC layers (terminated in an eNodeB 20 on the network side) may

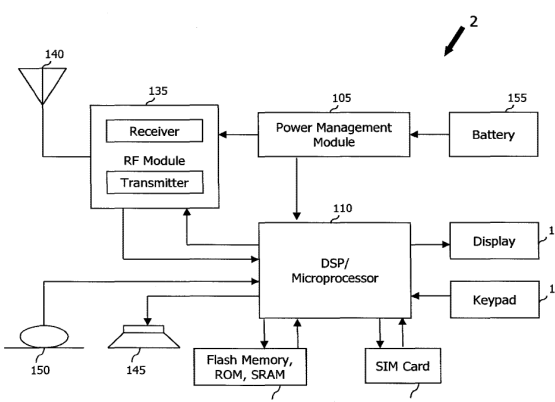
Subject Matter from EX. 1004 Cited in Analysis Below	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006) ²
	perform functions such as Scheduling, Automatic Repeat Request (ARQ), and Hybrid Automatic Repeat Request (HARQ). The PDCP layer (terminated in eNodeB 20 on the network side) may perform the user plane functions such as header compression, integrity protection, and ciphering. p. 42  The diagram shows two dashed boxes representing a User Equipment (UE) and an eNodeB (eNB). The UE box is labeled '10' and 'UE', and the eNB box is labeled '20' and 'eNB'. Each box contains four stacked rectangular blocks representing protocol layers: PDCP, RLC, MAC, and PHY. Horizontal double-headed arrows connect the corresponding layers between the UE and eNB: PDCP to PDCP, RLC to RLC, MAC to MAC, and PHY to PHY. p. 51. Further, a POSITA would understand from Fig. 3a (p. 51) that the eNB's "PHY" includes a transceiver, including a baseband circuit for processing wireless signals, and the termination of higher layers (MAC, RLC, PDCP) at the eNB includes processing logic and memory.

Subject Matter from EX. 1004 Cited in Analysis Below	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006) ²
 Figure 1	 p. 49
 Figure 13	“The supported SIB can be listed in a certain system information (e.g. MIB or SIB Type 1) which is always broadcast. The system information broadcast in a BCCH period includes a list of supported SIBs and indicates whether the supported SIBs are scheduled/broadcast or not in the current or the next BCCH period in which system information is periodically broadcast. The BCCH period can be either BCCH modification period or BCCH repetition period.”

Subject Matter from EX. 1004 Cited in Analysis Below	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006) ²
	p. 37 “When the network changes a certain type of on-demand system information, the network broadcasts all or the changed on-demand system information during a certain period (e.g. modification period). The period can be configured in master system information or any essential system information.” p. 37 “The network indicates the system information is to be changed by broadcast signaling (e.g. essential system information or paging message) during a certain period (e.g. modification period). The indication can be common for all SI or per SL.” p. 37 “The above change indication further includes whether the network broadcasts the on-demand SI in the next period (modification period). If the network is intended to broadcast on-demand SI in the next modification period, the network further indicates whether all or only changed SI is broadcasted in the above change indication.” p. 37

Subject Matter from EX. 1004 Cited in Analysis Below	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006) ²
	 p. 38
 Figure 14	“Some system information blocks may be missing. For instance, even if a cell supports MBMS service, D2D service, V2X service or WLAN interworking/integration, the cell may not broadcast SIB related to MBMS, D2D, V2X, or WLAN.” p. 37 “RAN broadcasts which SIB or which feature is supported at a cell. The supported SIB can be listed in a certain system information (e.g. MIB or SIB Type 1) which is always broadcast. The system information broadcast in a BCCH period includes a list of supported SIBs and indicates whether the supported SIBs are scheduled/broadcast or not in the current or the next BCCH period in which system information is periodically broadcast.” p. 37 “Upon detecting a missing SIB that a UE should read e.g. due to a supported

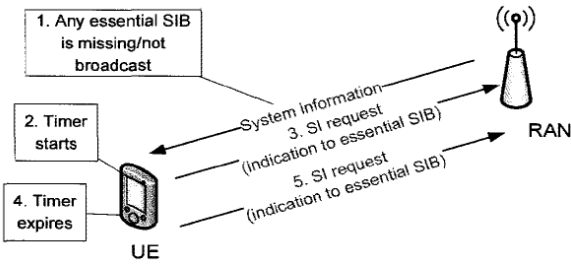
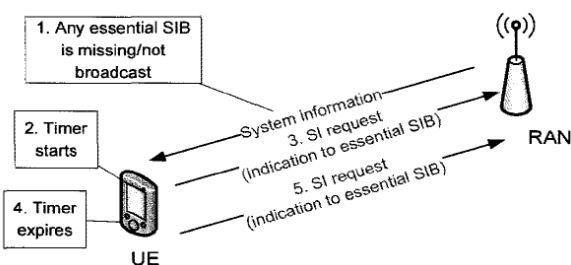
Subject Matter from EX. 1004 Cited in Analysis Below	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006) ²
	feature such as MBMS, D2D, V2X, or WLAN, UE sends SI request.” p. 37 “If a cell does not broadcast essential SIBs which UE needs to acquire at a cell, the SI request from a UE may alternatively indicate to RAN that essential SIBs are missing. Upon receiving the SI request, RAN sends the essential SIBs that are not broadcast to the UE.” p. 37  p. 37
 Figure 15	

Subject Matter from EX. 1004 Cited in Analysis Below	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006) ²
	p. 51. Further, a POSITA would understand from Fig. 3a (p. 51) that the eNB's "PHY" includes a transceiver, including a baseband circuit for processing wireless signals, and the termination of higher layers (MAC, RLC, PDCP) at the eNB includes processing logic and memory.  p. 55.

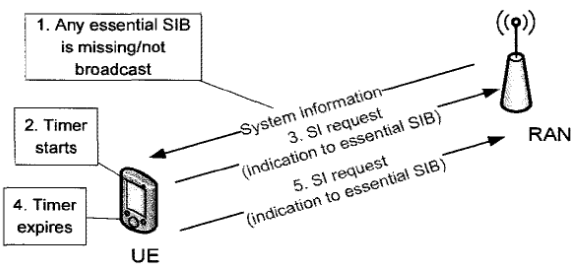
76. It is also my opinion that Lee's Claims are supported by the Lee Provisional. The table below identifies subject matter that supports Lee's Claims.

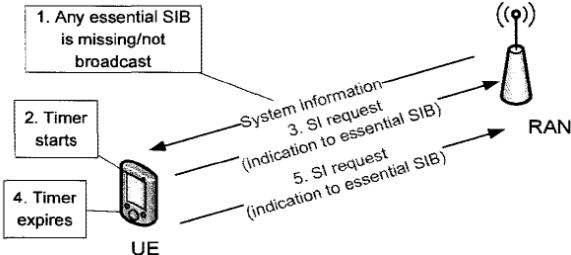
Lee Claim 1 (EX. 1004 at Claim 1)	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006)
1. A method for requesting, by a user equipment (UE), a system information block (SIB) in a wireless	"Some system information blocks may be missing. For instance, even if a cell supports MBMS service, D2D service, V2X service or WLAN interworking/integration, the cell may

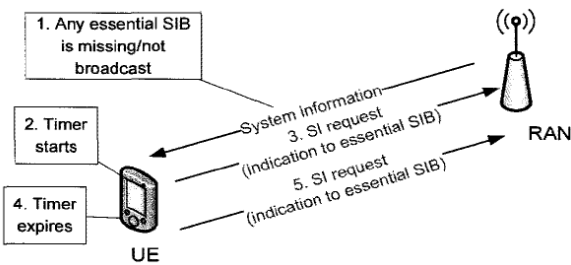
Lee Claim 1 (EX. 1004 at Claim 1)	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006)
communication system, the method comprising:	not broadcast SIB related to MBMS, D2D, V2X, or WLAN.” p. 37 “RAN broadcasts which SIB or which feature is supported at a cell. The supported SIB can be listed in a certain system information (e.g. MIB or SIB Type 1) which is always broadcast. The system information broadcast in a BCCH period includes a list of supported SIBs and indicates whether the supported SIBs are scheduled/broadcast or not in the current or the next BCCH period in which system information is periodically broadcast.” p. 37 “Upon detecting a missing SIB that a UE should read e.g. due to a supported feature such as MBMS, D2D, V2X, or WLAN, UE sends SI request.” p. 37 “If a cell does not broadcast essential SIBs which UE needs to acquire at a cell, the SI request from a UE may alternatively indicate to RAN that essential SIBs are missing. Upon receiving the SI request, RAN sends the essential SIBs that are not broadcast to the UE.” p. 37

Lee Claim 1 (EX. 1004 at Claim 1)	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006)
	 The diagram illustrates a process for requesting System Information Blocks (SIBs) from a Radio Access Network (RAN). It shows a User Equipment (UE) and a RAN. The process steps are: 1. Any essential SIB is missing/not broadcast. 2. Timer starts. 3. SI request (indication to essential SIB) is sent from UE to RAN. 4. Timer expires. 5. SI request (indication to essential SIB) is sent from UE to RAN. The RAN is represented by a tower icon, and the UE is represented by a mobile phone icon. Pp. 37
receiving an SIB list comprising one or more SIBs supported by a cell from a radio access network (RAN);	“RAN broadcasts which SIB or which feature is supported at a cell. The supported SIB can be listed in a certain system information (e.g. MIB or SIB Type 1) which is always broadcast. The system information broadcast in a BCCH period includes a list of supported SIBs and indicates whether the supported SIBs are scheduled/broadcast or not in the current or the next BCCH period in which system information is periodically broadcast.” p. 37  The diagram illustrates a process for requesting System Information Blocks (SIBs) from a Radio Access Network (RAN). It shows a User Equipment (UE) and a RAN. The process steps are: 1. Any essential SIB is missing/not broadcast. 2. Timer starts. 3. SI request (indication to essential SIB) is sent from UE to RAN. 4. Timer expires. 5. SI request (indication to essential SIB) is sent from UE to RAN. The RAN is represented by a tower icon, and the UE is represented by a mobile phone icon. p. 37

Lee Claim 1 (EX. 1004 at Claim 1)	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006)
receiving, from the RAN, SIB broadcast information indicating whether an SIB supported by the cell is broadcast in a broadcast control channel (BCCH) period;	“Some system information blocks may be missing. For instance, even if a cell supports MBMS service, D2D service, V2X service or WLAN interworking/integration, the cell may not broadcast SIB related to MBMS, D2D, V2X, or WLAN.” p. 37 “RAN broadcasts which SIB or which feature is supported at a cell. The supported SIB can be listed in a certain system information (e.g. MIB or SIB Type 1) which is always broadcast. The system information broadcast in a BCCH period includes a list of supported SIBs and indicates whether the supported SIBs are scheduled/broadcast or not in the current or the next BCCH period in which system information is periodically broadcast.” p. 37 “Upon detecting a missing SIB that a UE should read e.g. due to a supported feature such as MBMS, D2D, V2X, or WLAN, UE sends SI request.” p. 37 “If a cell does not broadcast essential SIBs which UE needs to acquire at a cell, the SI request from a UE may alternatively indicate to RAN that essential SIBs are missing. Upon

Lee Claim 1 (EX. 1004 at Claim 1)	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006)
	receiving the SI request, RAN sends the essential SIBs that are not broadcast to the UE.” p. 37  <pre> sequenceDiagram participant UE participant RAN Note over UE: 1. Any essential SIB is missing/not broadcast Note over UE: 2. Timer starts UE->>RAN: 3. SI request (indication to essential SIB) Note over UE: 4. Timer expires UE->>RAN: 5. SI request (indication to essential SIB) RAN->>UE: System information </pre> p. 37
detecting a missing SIB based on the SIB list and the SIB broadcast information; and	“Some system information blocks may be missing. For instance, even if a cell supports MBMS service, D2D service, V2X service or WLAN interworking/integration, the cell may not broadcast SIB related to MBMS, D2D, V2X, or WLAN.” p. 37 “RAN broadcasts which SIB or which feature is supported at a cell. The supported SIB can be listed in a certain system information (e.g. MIB or SIB Type 1) which is always broadcast. The system information broadcast in a BCCH period includes a list of supported SIBs and indicates whether the supported SIBs are scheduled/broadcast or not in the

Lee Claim 1 (EX. 1004 at Claim 1)	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006)
	current or the next BCCH period in which system information is periodically broadcast.” p. 37 “Upon detecting a missing SIB that a UE should read e.g. due to a supported feature such as MBMS, D2D, V2X, or WLAN, UE sends SI request.” p. 37  <pre> sequenceDiagram participant UE participant RAN Note over UE: 1. Any essential SIB is missing/not broadcast Note over UE: 2. Timer starts Note over UE: 4. Timer expires UE->>RAN: 3. SI request (indication to essential SIB) RAN->>UE: System Information UE->>RAN: 5. SI request (indication to essential SIB) </pre> p. 37
requesting the missing SIB from the RAN.	“Upon detecting a missing SIB that a UE should read e.g. due to a supported feature such as MBMS, D2D, V2X, or WLAN, UE sends SI request.” p. 37 “If a cell does not broadcast essential SIBs which UE needs to acquire at a cell, the SI request from a UE may alternatively indicate to RAN that essential SIBs are missing. Upon receiving the SI request, RAN sends the

Lee Claim 1 (EX. 1004 at Claim 1)	Supporting Corresponding Subject Matter in Lee Provisional (EX. 1006)
	essential SIBs that are not broadcast to the UE.” p. 37  p. 37

B. Brismar

1. Overview of Brismar

77. Brismar generally describes a method “implemented by a network node in a wireless communication network to transmitting system information to a plurality of wireless terminals.” *Id.* at Abstract. In particular, Brismar is directed to transmitting a first group of system information blocks via a first physical channel, and a second group of additional SIBs via a second (different) physical channel. *Id.*

78. Similar to Lee discussed above, Brismar discloses different types of SIBs. For example, in Fig. 2A-2C which are reproduced below, Brismar depicts an

example of a method performed by a network node to distribute system information.

Id. at [0083]. Fig. 2A. The system transmits a first SIB (for example, MIB/SB-BC1) on a first channel, and transmits a new SIB on a second channel. *Id.*

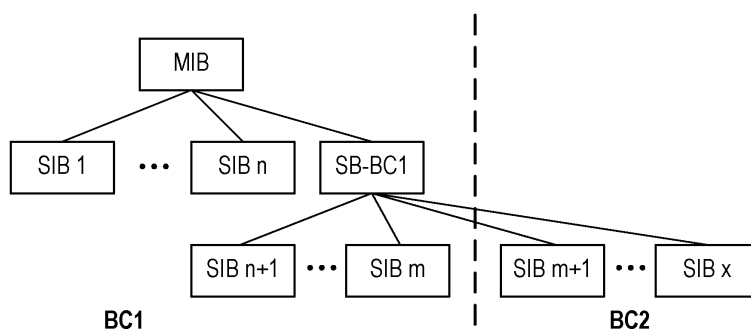


FIG. 2A

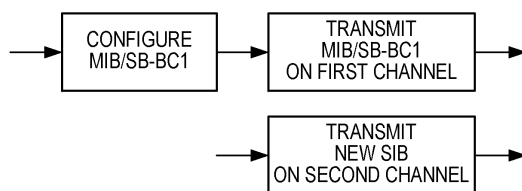


FIG. 2B

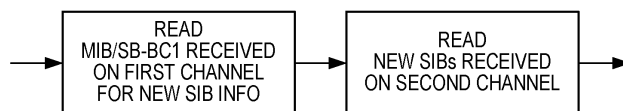


FIG. 2C

EX. 1005 at Figure 2A-2C.

79. Brismar teaches that a first type of SIB comprises static system

information, and a second type of SIB comprises dynamic system information. The static system information is grouped in the same SIB and transmitted on the broadcast channel using the same repetition period. *Id.* at [0103]. There is no benefit to getting a subset of the static BC2 information before the UE has been able to read all legacy SIBs on BC1. *Id.*

80. “The information included in the SB-BC1 may include any one or more of:

- a SIB type which identifies the SIBs (e.g., SIB m+1 . . . SIB x). The SIB type may implicitly indicate that the SIB is transmitted on the second distribution channel utilizing the BC2 mechanism;
- an explicit indication that the SIB is transmitted on the second distribution channel utilizing the BC2 mechanism;
- an indication whether the area scope of the SIB is “cell” or “PLMN”;
- a value tag if the SIB includes static information;
- an expiration timer if the SIB includes dynamic information;
- a start position (e.g., SFN) on the second distribution channel where the first SIB segment (e.g., SIB m+1) is scheduled and

optionally one or several offset parameters if the subsequent SIB segments are not sent in consecutive TTIs;

- a repetition period indicating how often the SIB is repeated on the broadcast channel.” Brismar at [0074-0081].

Id. at [0074-0081].

81. “In this embodiment, legacy update mechanisms may be reused. When the network (e.g., the RNC, RBS) modifies the content of a SIB transmitted on the second distribution channel, the network may also increment the SIB value tag contained in SB-BC1. The change may propagate up to the MIB on BC1, and the new MIB value tag may be signaled to the UE, e.g., on the PCH and FACH/HS-DSCH transport channels, using the legacy notification messages. For dynamic SIBs, expiration timers may be used.” *Id.* at [0087].

82. For the first type SIB containing static information, Brismar teaches that “a value tag is used to indicate when there is a need for the UE to read new information on the broadcast channel.” *Id.* at [0012]. The SIB value tag is sent with the scheduling information in the MIB or in SB. “Whenever SIB content is modified, the corresponding SIB value tag is updated by the network.” *Id.* The new value tag is signaled in message Paging Type 1 and System Information Change Information to notify the UEs that the system information has changed. Once the UE receives this notification, it compares the value tags and if they differ, the UE needs to

reacquire the SIB to get the most up-to-date system information. *Id.*

83. Brismar additionally teaches an on-demand scheduling scheme. *Id.* at [0125]. In this alternative method, the system information is not sent periodically on the broadcast channel, but is requested by the UE. This way, information is only sent when the UE needs it. This is depicted in Figure 12, reproduced below.

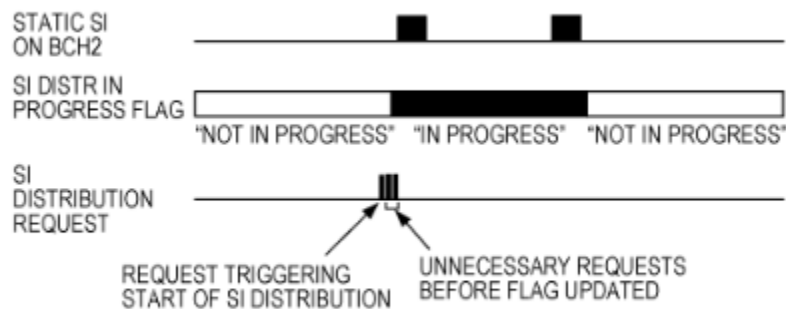


FIG. 12

Id. at Figure 12.

84. “In this embodiment, legacy update mechanisms may be reused. When the network (e.g., the RNC, RBS) modifies the content of a SIB transmitted on the second distribution channel, the network may also increment the SIB value tag contained in SB-BC1. The change may propagate up to the MIB on BC1, and the new MIB value tag may be signaled to the UE, e.g., on the PCH and FACH/HS-DSCH transport channels, using the legacy notification messages. For dynamic SIBs, expiration timers may be used.” *Id.* at [0087].

85. “On-demand scheduling: In this alternative, the system information is

not sent periodically on the broadcast channel. Rather, UE may request the information, e.g., when entering a new cell for which the UE has no stored information. This scheduling option makes it possible to use a more aggressive DTX scheme as the information may be sent only when a UE needs it. The UE may request the system information using different means.” Brismar at [0125].

86. “The system information can be divided into static parts that remain unchanged over long times, and dynamic parts that are updated quite frequently...In practice, the UE will need to read static SI quite seldom, typically when entering cells the UE has not been in recently (UEs typically remember the SI from cells it has recently visited, to avoid having to read the SI again when returning to the cell). In order to save downlink capacity, one idea is to not continuously distribute the static SI, but instead only distribute it when a UE requests it (referred to as on-demand SI distribution). This can avoid the continuous transmission of information that no UE is listening to, which is a waste of resources.” Brismar at [0159].

87. “One potential issue with UEs sending SI distribution requests is that many UEs can request that same SI information at the same time, causing a high uplink load. As an illustration, consider a case of a train with many UEs arriving into a new cell. All UEs on that train would like to read SI for the new cell.” *Id.* at [0170]. “In order to avoid this unnecessary uplink load, the RBS can, according to one embodiment, be given the possibility to block UEs from sending SI distribution

requests. This can be accomplished by introducing an RBS controlled flag in the downlink denoted as SI distribution in progress flag. In this embodiment, the UE may be required to read the SI distribution in progress flag before attempting to send the SI distribution request. If the flag indicates that SI distribution is in progress, the UE may be required to refrain from sending the SI distribution request.” *Id.* at [0171].

88. Brismar discloses that “the UE may be required to first monitor the SI distribution in progress flag, and if SI distribution is not already in progress (or soon to start), the UE then may send its SI distribution request.” *Id.* at [0173].

X. CLAIMS 1-4 ARE UNPATENTABLE

A. Ground 1: The Challenged Claims are Anticipated and/or Rendered Obvious by Lee

a) Claim 1

[1pre] An access node of a radio access network that communicates over a radio interface with a wireless terminal, the access node comprising:

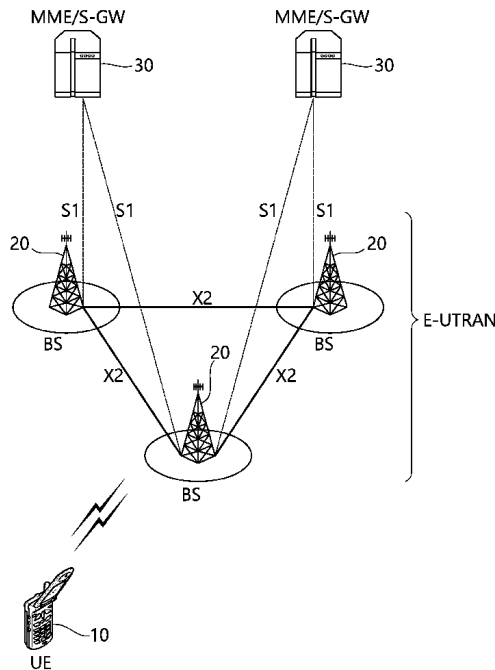
89. Lee is directed to “a method for requesting, by a user equipment (UE), a system information block (SIB) in a wireless communication system. The method may include: receiving an SIB list including one or more SIBs supported by a cell from a radio access network (RAN); receiving, from the RAN, SIB broadcast information indicating whether an SIB supported by the cell is broadcast in a broadcast control channel (BCCH) period; detecting a missing SIB based on the SIB

list and the SIB broadcast information; and requesting the missing SIB from the RAN.” *Id.* at [0009].

90. Lee teaches “An access node of a radio access network that communicates over a radio interface with a wireless terminal.” For example, in Figure 1 reproduced below, Lee depicts an LTE system architecture including one or more UEs, an evolved-UMTS terrestrial radio access network (E-UTRAN) and an evolved packet core (EPC). EX. 1004 at [0041]. The E-TRAN includes one or more evolved node-B (ENB) and a plurality of UEs in one cell. *Id.* at [0042]. The eNB is generally a fixed station that communicates with the UE. The eNB may also be referred to as a BS or an access point. *Id.*

91. In wireless communication networks, downlink (DL) denotes communication from the eNB to the UE, and uplink (UL) denotes communication from the UE to the eNB. In a DL transmission, a transmitter is part of the eNB and a receive is part of the UE. Vice versa, in UL transmissions, the transmitter is part of the UE and the receiver is part of the eNB. *Id.* at [0043].

FIG. 1



92. *Id.* at Fig. 1, [0041]-[0042].

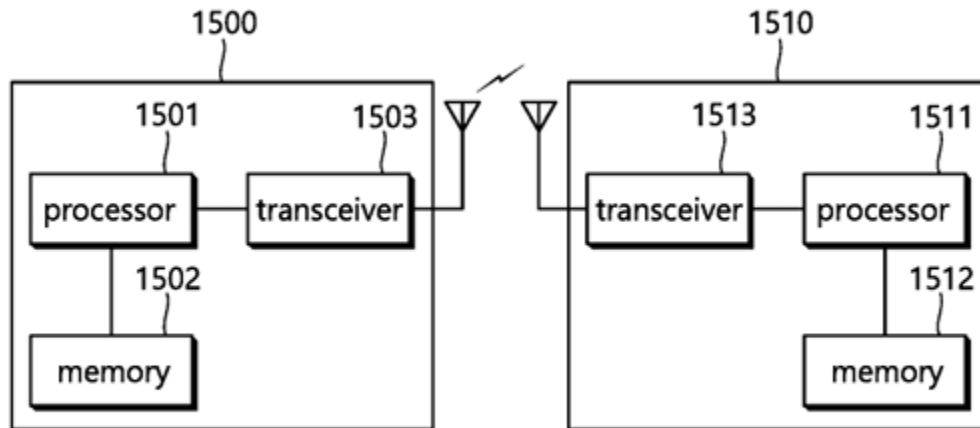
93. Thus, Lee discloses “an access node of a radio access network that communicates over a radio interface with a wireless terminal.” EX. 1001 at Claim 1. EX. 1001 at Claim 1.

[1a] processor circuitry configured:

94. Lee teaches “processor circuitry configured” to perform the claimed functionality. For example, Lee explicitly discloses that the “BS includes a processor.” *Id.* at [0184]. Lee explains that the processor “implements proposed functions, processes and/or methods” and that “an operation of the BS may be

implemented by the processor.” *Id.*

95. The presence of the processor(s) in the BS (element 1501) is depicted as in Figure 15, reproduced below.



Id. at Fig. 15, [0185]-[0186].

96. In my opinion, a POSITA would understand that a processor necessarily includes processor circuitry which is configured to implement the desired functionality. This is made apparent by Lee’s explicit disclosure that “implements proposed functions, processes and/or methods” and that “an operation of the BS may be implemented by the processor.” *Id.* at [0184].

97. Accordingly, Lee teaches “processor circuitry configured to” perform the functionality discussed below. EX. 1001 at Claim 1.

[1b] to generate a first type system information block (SIB) comprising information and a value tag, the information indicating whether one or more associated second type system information blocks are provided by broadcast or on-demand, the value tag being updated upon a change of a corresponding second type SIB, the first type SIB being required for the wireless terminal to perform an initial access to the radio access network;

98. Lee teaches processor circuitry configured to “to generate a first type system information block (SIB) comprising information and a value tag, the information indicating whether one or more associated second type system information blocks are provided by broadcast or on-demand, the value tag being updated upon a change of a corresponding second type SIB, the first type SIB being required for the wireless terminal to perform an initial access to the radio access network.”

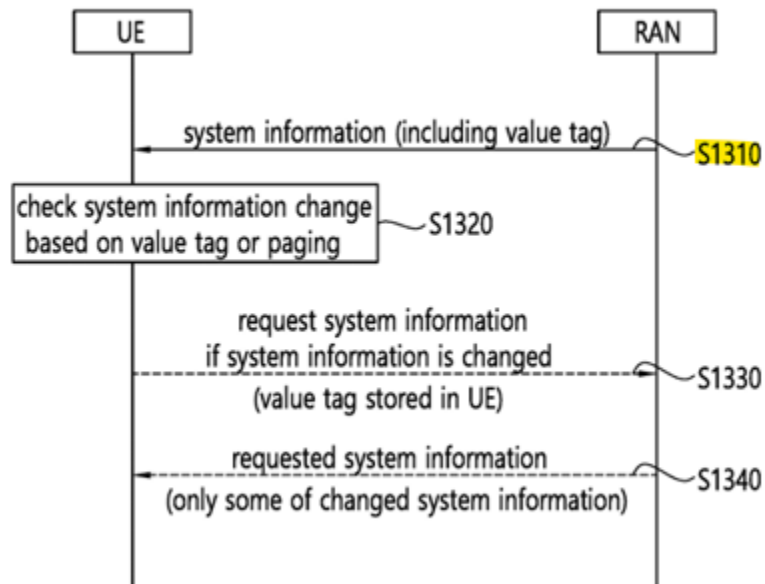
99. Lee teaches “generating a first type system information block” wherein “the first type SIB [is] required for the wireless terminal to perform an initial access to the radio access network.” For example, Lee introduces SIB1 and teaches that “SIB1 includes pieces of information associated with cell access, and particularly includes scheduling information on other SIBs (SIB2 to SIBn). EX. 1004 at [0071]. The first type SIB is required for the wireless terminal to perform an initial access to the RAN. Therefore, Lee teaches that the circuitry is configured “to generate a first type system information block...the first type SIB being required for the

wireless terminal to perform an initial access to the radio access network.” *Id.*

100. Lee also discloses additional SIBs, including SIB2 which includes necessary information for a UE to access a cell. SIB2 includes information on an uplink cell bandwidth, a random access parameter, and an uplink power control parameter.” EX. 1004 at [0072]. The additional SIBs include a variety of information, explained in my overview of Lee above and outlined in the Table I created corresponding to the type of information included with each SIB. *See supra* IX.A.1.

101. Lee discloses that “the first type SIB comprises information and a value tag.” This is seen at step S1310 in Figure 13, reproduced below.

102.

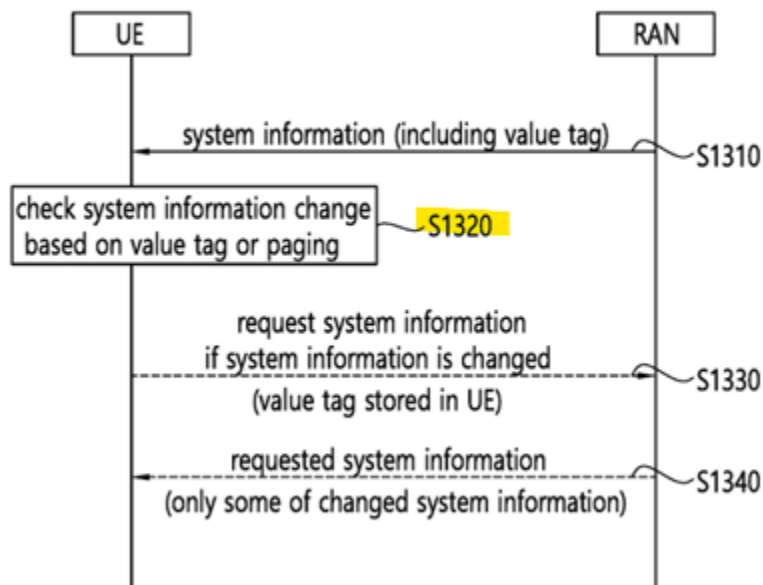


EX. 1004 at Fig. 13 (annotation added); [0166]. Lee discloses that “when a network changes a particular type of on-demand system information, the network may broadcast the changed system information [0167]. “Additionally, the network may indicate to the UE whether on-demand system information is broadcast in the next period.” [0168]. Thus, Lee discloses “information indicating whether one or more associated second type system information blocks are provided by broadcast or on-demand.”

103. Lee also teaches that “the value tag [can be] updated upon a change of a corresponding second type SIB.” For example, Lee teaches that in Figure 13 above, “the network may indicate to the UE that on-demand system information is to be changed by broadcast signaling during a specified period. For example, the broadcast signaling may be essential system information or a paging message. This indication may include a value tag for a particular type of system information or a common value tag for all system information. Additionally, the network may indicate to the UE whether on-demand system information is broadcast in the next period (e.g., the next modification period). When the network intends to broadcast on-demand system information in the next period, the network may indicate to the UE whether all system information is broadcast or only changed on-demand system information is broadcast. Regardless of on-demand system information, the network may broadcast all system information or changed on-demand system information

without a request by the UE.” *Id.* at [0168]. In other words, Lee discloses both (1) information about whether the second type SI is broadcast or on-demand and (2) a value tag indicating change in second type SIB.

104. The broadcast signaling includes the essential system information or paging information. The value tag for the other type of system information indicates whether there has been a change to the system information (for example, if the value tag has changed). At step S1320 (highlighted below), the UE checks if the system information has changed based on value tag, for example. The UE may alternatively determine whether the on-demand system information is changed based on the paging message. *Id.* at [0169].



EX. 1004 at Fig. 13 (annotation added), [0166].

105. The table below overviews what I consider to be the first and

second type SIBs (relative to the Claim language) in Lee's disclosure. Specifically, at S1310 in Figure 13 above, Lee's system transmits a first type SIB (which includes information and a value tag). Upon determining that system information has changed based on either value tag or paging, a second type SIB (requested by the UE) is transmitted at step S1340. The value tag provides the indication as to the system information changing in order to prompt the UE to request transmission of the changed SI.

System Information Block Type from the Challenged Claims	Lee's Disclosure
First Type SIB	System information (including value tag), S1310 in Figure 13
Second Type SIB	Requested system information (changed system information), S1340 in Figure 13

106. Thus, Lee discloses "generating a first type system information block (SIB) comprising information and a value tag, the information indicating whether one or more associated second type system information blocks are provided by broadcast or on-demand, the value tag being updated upon a change of a corresponding second type SIB, the first type SIB being required for the wireless terminal to perform an initial access to the radio access network." EX. 1001 at Claim 1.

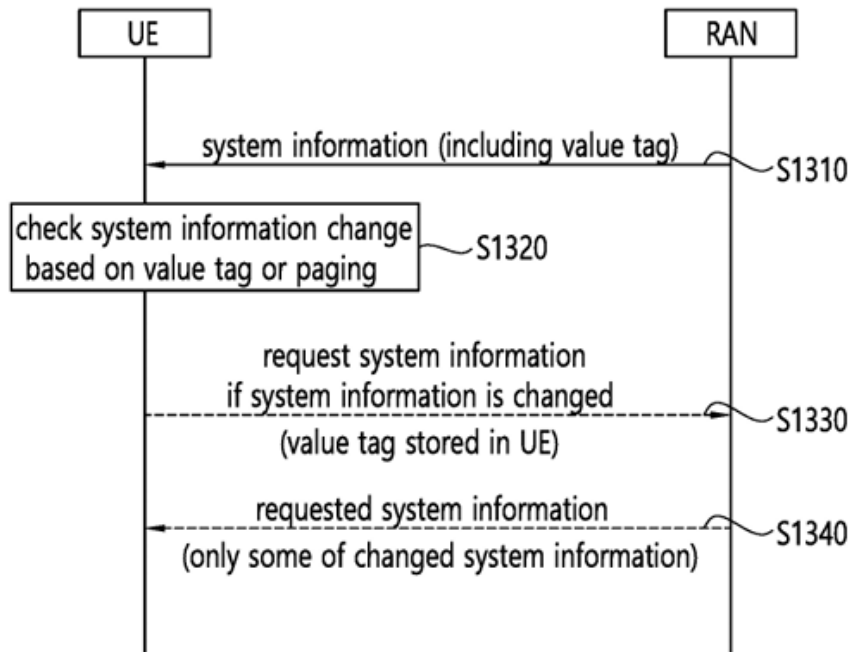
[1c] upon a change of a second type SIB whose associated information indicated before the change that the second type SIB was provided on-demand, to include in the first type SIB the information associated with the second type SIB indicating that the second type SIB is provided by broadcast;

107. Lee teaches or renders obvious that “upon a change of a second type SIB whose associated information indicated before the change that the second type SIB was provided on-demand, to include in the first type SIB the information associated with the second type SIB indicating that the second type SIB is provided by broadcast.” The first type SIB includes a value tag which provides an indication of if and when the second type SIB has been changed. *See supra* Section X.A.(a)[1b].

108. Lee discloses that when “a network changes a particular type of on-demand system information, the network may broadcast the changed system information or all system information during a specified period. For example, the specified period may be a modification period. The specified period may be set in master system information or any necessary system information.” *Id.* at [0167]. Lee also teaches that the UE may check whether the second type SIB is changed based on the value tag. EX. 1004 at [0169].

109. In Figure 13, reproduced below, Lee discloses that at step S1310 “the network may indicate to the UE that on-demand system information is to be changed by broadcast signaling during a specified period. For example, the broadcast

signaling may be essential system information or a paging message. This indication may include a value tag for a particular type of system information or a common value tag for all system information. Additionally, the network may indicate to the UE whether on-demand system information is broadcast in the next period (e.g., the next modification period). When the network intends to broadcast on-demand system information in the next period, the network may indicate to the UE whether all system information is broadcast or only changed on-demand system information is broadcast. Regardless of on-demand system information, the network may broadcast all system information or changed on-demand system information without a request by the UE.” *Id.* at [0168]. This disclosure shows that Lee teaches when on-demand system information has changed, that system information may be broadcast.



EX. 1004 at Fig. 13; [0168].

110. Not only does Lee disclose this limitation, but in my opinion, it would be obvious to a POSITA in light of Lee's disclosure. Lee very clearly teaches that there is a value tag and an indication of whether a system information block is on demand in the first type SIB. *See supra* Section X.A.(a)[1b]. In my opinion, a POSITA would therefore understand that the first type SIB therefore needs to include a message that says that the changed system information is now broadcast (and include the updated value tag) so that the UE's needing the updated system information know to prepare to receive it.

111. If the Board disagrees that the Claim limitation is necessarily disclosed

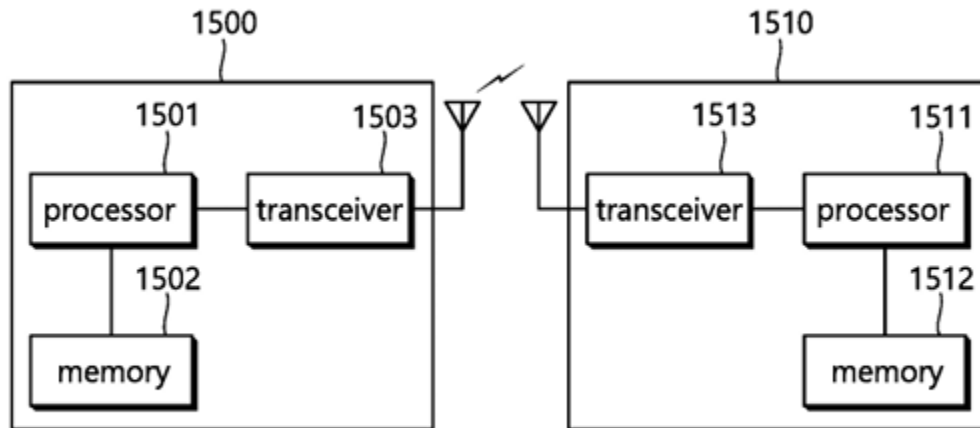
in Lee, it is my opinion that the functionality would be obvious to a POSITA. Upon a change of the second type SIB, the first type SIB would need to indicate to the UE that the changed on-demand system information will be broadcast. A POSITA would interpret and/or modify Lee's disclosure in light of this knowledge, because the UE would require an indication that this information would be broadcast in order to know to receive it. Otherwise, the information would just be changed and broadcast, but the UE would have no way to know to receive such changed system information.

112. Thus, Lee discloses or renders that “upon a change of a second type SIB whose associated information indicated before the change that the second type SIB was provided on-demand, to include in the first type SIB the information associated with the second type SIB indicating that the second type SIB is provided by broadcast.” EX. 1001 at Claim 1.

[1d] transmitter circuitry configured to:

113. Lee teaches “transmitter circuitry configured” to perform the claimed functionality. Lee discloses that “when system information is changed, UEs need to know in advance the time the *BS transmits new system information.*” EX. 1002 at [0076] (emphasis added). In my opinion, A POSITA would understand that this disclosure necessarily requires the presence of transmitter circuitry, because such circuitry must exist in the system in order for the BS to be able to “transmit new system information.” This is also depicted in Figure 15, reproduced below, which

discloses the presence of a transceiver as part of BS (1500).



Id. at Fig. 15, [0185]-[0186].

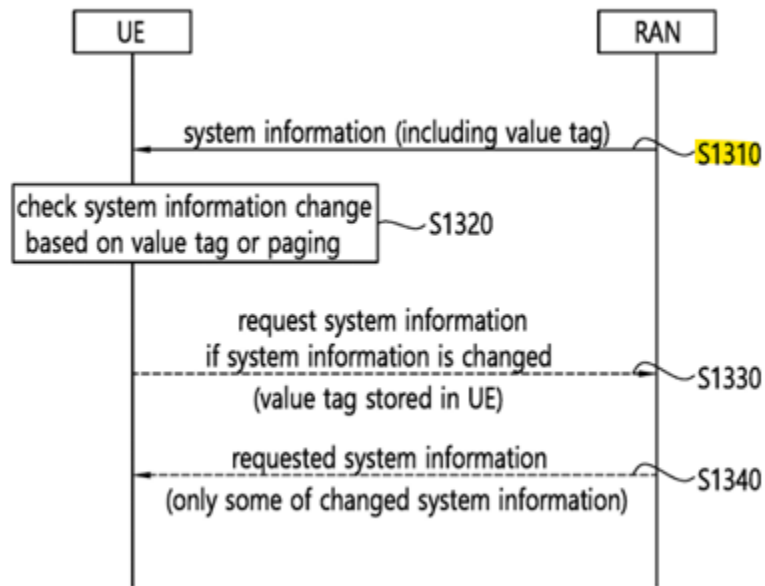
114. Lee discloses that, with reference to Figure 15 above, the pictured transceiver “transmits and/or receives radio signals.” In my opinion, a POSITA would also understand that the transmission of radio signals necessarily requires transmitter circuitry.

115. Thus, Lee teaches “transmitter circuitry configured” to perform the functionality discussed in detail below. EX. 1001 at Claim 1.

[1e] transmit the first type SIB;

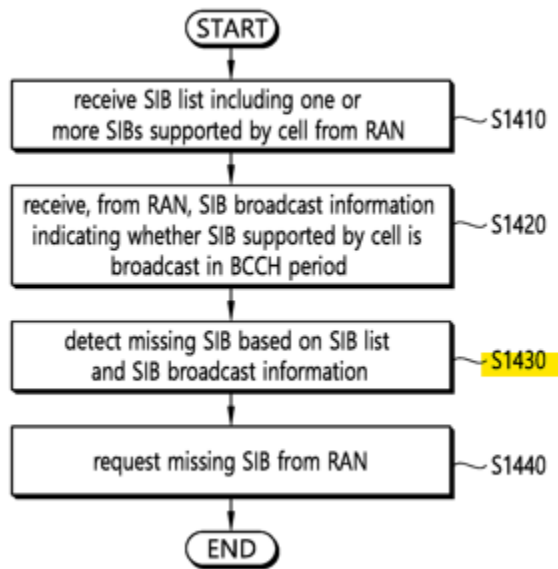
116. Lee teaches that the transmitter circuitry is configured to “transmit the first type SIB.” Lee discloses that “the BS transmits [new] system information.” EX. 1004 at [0076].

117. Lee additionally discloses that “SIB1 includes pieces of information associated with cell access, and particularly includes scheduling information on other SIB s (SIB2 to SIBn) than SIB1. SIBs having the same transmission periodicity among the SIBs other than SIB1 are transferred via the same system information (SI) message. Thus, scheduling information includes a mapping relationship between each SIB and an SI message. An SI message is transmitted within an SI window in a time domain, and each SI message is associated with one SI window. Since SI windows for different pieces of SI do not overlap, only one SI message is transmitted within an SI window. Thus, scheduling information includes the duration of an SI window and an SI transmission periodicity. Time/frequency for transmitting an SI message is determined by dynamic scheduling by a BS. SIB1 is broadcast through a downlink shared channel (DL SCH) according to a periodicity of eight radio frames (that is, 80-ms periodicity), and SIB1 is repeatedly retransmitted on a fifth subframe of an SFN-mod-2 radio frame within the 80-ms periodicity.” *Id.* at [0071]. This is depicted in Figure 13, reproduced below.



EX. 1004 at Fig. 13 (annotation added), [0166].

118. In Figure 14, reproduced below, illustrates a method in which a UE requests an SIB. *Id.* at [0172]. At step S1430 (highlighted below), “the UE may detect a missing SIB based on the SIB list and the SIB broadcast information. The missing SIB may be an SIB that is not broadcasted in the BCCH period among the SIBs included in the SIB list. The BCCH period may be the current BCCH period or the next BCCH period. The missing SIB may be an SIB that the UE needs to receive from the RAN in order to perform a particular service. The particular service may include at least one of an MBMS service, a D2D service, a V2X service, or WLAN interworking.” *Id.* at [0175]-[0177].



EX. 1004 at Fig. 14 (annotation added), [0166].

119. Thus, Lee teaches element “transmit[ting] the first type SIB.” EX. 1001 at Claim 1.

[1f] transmit a message that triggers the wireless terminal to receive the first type SIB, wherein;

120. Lee teaches that the transmitter circuitry is configured to “transmit a message that triggers the wireless terminal to receive the first type SIB.”

121. Lee teaches that “SIB1 includes pieces of information associated with cell access, and particularly includes scheduling information on other SIB s (SIB2 to SIBn) than SIB1. SIBs having the same transmission periodicity among the SIBs other than SIB1 are transferred via the same system information (SI) message. Thus, scheduling information includes a mapping relationship between each SIB and an SI

message. An SI message is transmitted within an SI window in a time domain, and each SI message is associated with one SI window. Since SI windows for different pieces of SI do not overlap, only one SI message is transmitted within an SI window. Thus, scheduling information includes the duration of an SI window and an SI transmission periodicity. Time/frequency for transmitting an SI message is determined by dynamic scheduling by a BS. SIB1 is broadcast through a downlink shared channel (DL SCH) according to a periodicity of eight radio frames (that is, 80-ms periodicity), and SIB1 is repeatedly retransmitted on a fifth subframe of an SFN-mod-2 radio frame within the 80-ms periodicity.” EX. 1004 at [0071]. In other words, Lee teaches that SIB1 is transferred via a system information message.

122. Lee further discloses that “the eNB 20 may notify the UE that the SIB information is to be changed soon through a paging in a modification period before broadcasting changed SIB information. Thereafter, the changed SIB information is broadcast in a next modification period.” *Id.* at [082]. “After completing the modification period in which the paging is received, the UE receives SIB1 information to received new SIB information (S504).” *Id.*

123. Lee additionally discloses that “the network may indicate to the UE that on-demand system information is to be changed by broadcast signaling during a specified period. For example, the broadcast signaling may be essential system information or a paging message.” *Id.* at [0168].

124. Further, as I went over above, Lee teaches that “SIB1 includes pieces of information associated with cell access, and particularly includes scheduling information on other SIBs (SIB2 to SIBn). EX. 1004 at [0071]. In other words, the first type SIB must be received first, in order to receive other SIBs. *See supra* Section X.A.(a)[1b]. Lee further teaches that “a BS, which intends to update system information in an (n+1)th modification period, notifies in advance UEs of an update of system information in an nth modification period. A UE, which is notified the update of the system information in the nth modification period, receives and applies new system information at the very beginning of the (n+1)th modification period. When an update of system information is scheduled, the BS includes a system information modification indicator in a paging message. Generally, a paging message is a message received by an idle-mode UE. However, since an update of system information is notified through a paging message, a connected-mode UE also needs to receive a paging message at times and to identify an update of system information”. EX. 1004 at [0078]. Put simply, Lee discloses a paging message.

125. A UE must be configured to receive RAN transmissions in order for SIB information to be communicated from a RAN to a UE. Thus, in my opinion, a POSITA would understand that the system disclosed in Lee is configured in such a way to ensure that this will occur. In other words, the UE in Lee’s system must be configured, via a message from the RAN, to configure the UE to receive first type

SIB from the RAN so that the UE may then receive the other SIBs.

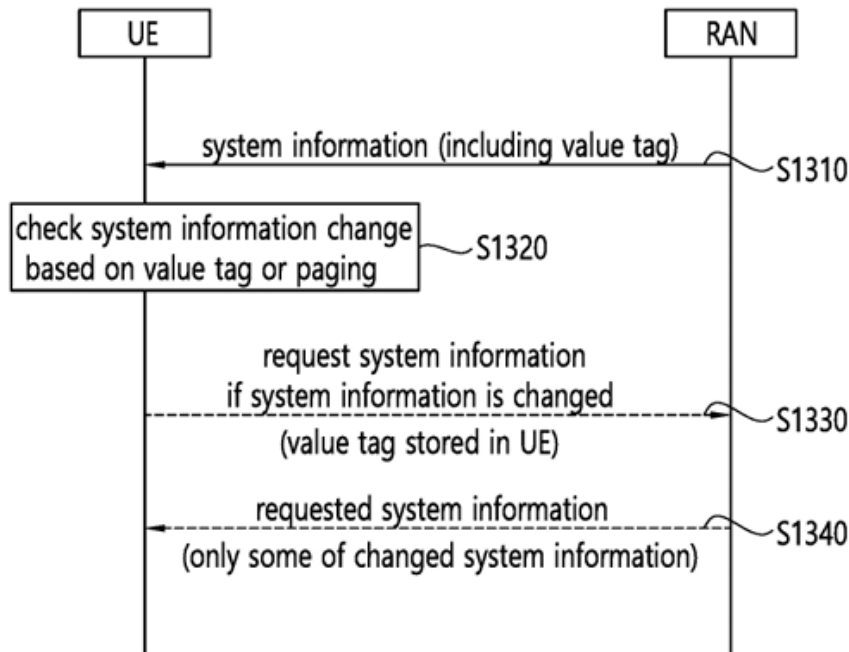
126. Thus, Lee teaches transmitter circuitry configured to “transmit the first type SIB.” EX. 1001 at Claim 1.

[1g] whether or not the second type SIB has changed is determined based on a value tag, associated with the second type SIB, stored in the wireless terminal, and the value tag included in the first type SIB corresponding to the second type SIB.

127. Lee teaches that the transmitter circuitry is configured to, “whether or not the second type SIB has changed is determined based on a value tag, associated with the second type SIB, stored in the wireless terminal, and the value tag included in the first type SIB corresponding to the second type SIB.”

128. Lee discloses that “SIB1 may include scheduling information on other SIBs. Therefore, SIB1 needs to be received first in order to receive other SIB information.” EX. 1004 at [0083].

129. As I have explained above with reference to limitation [1b], first type SIB includes a value tag corresponding to the second type SIB. *See supra* [cite]. Thus, Lee discloses that the value tag is “included in the first type system information block” and that the value tag is “corresponding to the second type SIB.”



EX. 1004 at Fig. 13, [0168].

130. Figure 13 above illustrates a procedure in which a UE requests changed system information. EX. 1004 at [0166]. At step S1320, the UE may check whether the on-demand system information is changed. For example, the UE may determine whether the on-demand system information is changed based on the value tag. For example, the UE may determine whether the on-demand system information is changed based on the paging message.”

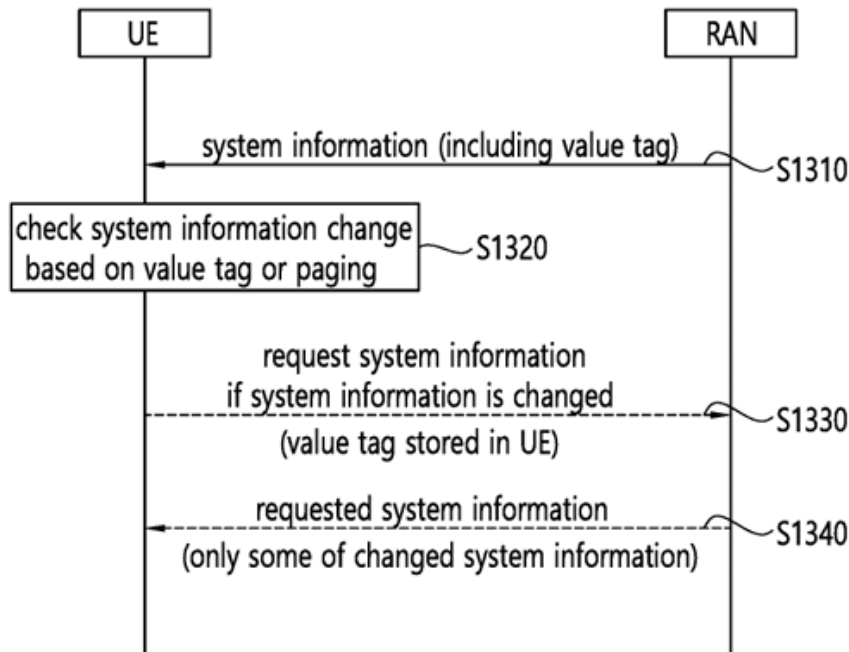
131. Thus, Lee that “whether or not the second type SIB has changed is determined based on a value tag, associated with the second type SIB, stored in the wireless terminal, and the value tag included in the first type SIB corresponding to

the second type SIB.” EX. 1001 at Claim 1

b) Claim 2: The access node of Claim 1, wherein the transmitter circuitry is further configured to transmit the second type SIB by broadcast after the change.

132. Lee teaches Claim 1 as explained above, and wherein “the transmitter circuitry is further configured to transmit the second type SIB by broadcast after the change.”

133. Figure 13, reproduced below, illustrates Lee’s disclosure of transmitting a second type SIB after the change. Specifically, “in step S1310, the network may indicate to the UE that on-demand system information is to be changed by broadcast signaling during a specified period. For example, the broadcast signaling may be essential system information or a paging message. This indication may include a value tag for a particular type of system information or a common value tag for all system information. Additionally, the network may indicate to the UE whether on-demand system information is broadcast in the next period (e.g., the next modification period). When the network intends to broadcast on-demand system information in the next period, the network may indicate to the UE whether all system information is broadcast or only changed on-demand system information is broadcast. Regardless of on-demand system information, the network may broadcast all system information or changed on-demand system information without a request by the UE.” *Id.* at [0168].



Id. at Fig. 13, [0166].

134. Thus, Lee discloses generating “transmitter circuitry ... configured to transmit the second type SIB by broadcast after the change.” EX. 1001 at Claim 2.

c) Claim 3

135. In my opinion, Claim 3 is substantively the same as Claim 1, but is directed to a method for an access node of a radio access network rather than the access node itself. Claim 3’s limitations, where not identical to Claim 1’s limitations, recite the step the corresponding limitation requires the access node to be configured to perform the recited function.

136. Therefore, the same teachings of Lee that anticipate and/or render the

limitations of Claim 1 obvious, anticipate and/or render the same limitations in Claim 3 obvious, as it is obvious both to configure an access node to perform a step and to have the access node actually perform the step.

[3pre] A method for an access node of a radio access network that communicates over a radio interface with a wireless terminal, the method comprising:

137. As discussed above, limitation [1pre] recites an “access node of a radio access network that communicates over a radio interface with a wireless terminal.” Limitation [3pre] recites a “method for an access node of a radio access network that communicates over a radio interface with a wireless terminal.” For the same reasons as I described with respect to limitation [1pre], the same disclosures and analysis regarding Lee renders limitation [3pre] anticipated and/or obvious.

[3a] generating a first type system information block (SIB) comprising information and a value tag, the information indicating whether one or more associated second type system information blocks are provided by broadcast or on-demand, the value tag being updated upon a change of a corresponding second type SIB, the first type SIB being required for the wireless terminal to perform an initial access to the radio access network;

138. Limitation [1b] recites “transmitting circuitry configured to transmit” the same first type SIB with the same requirements. Limitation [3a] similarly recites “generating a first type system information block” with the same requirements. For

the same reasons as I described with respect to limitation [1b], the same disclosures and analysis regarding Lee renders limitation [3a] anticipated and/or obvious.

[3b] upon a change of a second type SIB whose associated information indicated before the change that the second type SIB was provided on-demand, including in the first type SIB the information associated with the second type SIB indicating that the second type SIB is provided by broadcast;

139. Limitation [1c] recites “including in the first type system information block” certain information “upon a change of a second type SIB.” Limitation [3b] similarly recites “including in the first type system information block” the same information “upon a change of a second type SIB.” For the same reasons as I described with respect to limitation [1c], the same disclosures and analysis regarding Lee renders limitation [3b] anticipated and/or obvious.

[3c] transmitting the first type SIB;

140. Limitation [1e] recites “transmitting circuitry configured to transmit” the first type SIB. Limitation [3c] similarly recites “transmitting the first type SIB.” For the same reasons as I described with respect to limitation [1e], the same disclosures and analysis regarding Lee renders limitation [3c] anticipated and/or obvious.

[3d] transmitting a message that triggers the wireless terminal to receive the first type SIB, wherein;

141. Limitation [3d] recites “transmitting a message that triggers the

wireless terminal to receive the first type SIB,” while limitation [1f] recites “transmitting circuitry configured to transmit” the same message. For the same reasons as I described with respect to limitation [1f], the same disclosures and analysis regarding Lee renders limitation [3d] anticipated and/or obvious.

[3e] whether or not the second type SIB has changed is determined based on a value tag, associated with the second type SIB, stored in the wireless terminal, and the value tag included in the first type SIB corresponding to the second type SIB.

142. Limitation [1g] is the same as limitation [3e] verbatim. For the same reasons as I described with limitation [1g], the same disclosures and analysis render limitation [3e] obvious.

d) Claim 4: The method of Claim 3, further comprising transmitting the second type SIB by broadcast after the change.

143. As with Claim 3, Claim 4 is substantively the same as Claim 2, but dependent on the recitation of the method steps of Claim 3. Claim 4’s limitations, where not identical to Claim 2’s limitations, recite the step the corresponding limitation requires the access node to be configured to perform the recited functions. The same teachings of Lee that anticipate and/or render the limitations of Claim 2 obvious, anticipate and/or render the same limitations in Claim 4 obvious, as it is obvious both to configure an access node to perform a step and to have the access node actually perform the step.

B. Ground 2: Brismar

1. The Challenged Claims are Anticipated and/or Rendered Obvious by Brismar

a) Claim 1

[1pre] An access node of a radio access network that communicates over a radio interface with a wireless terminal, the access node comprising:

144. Brismar teaches “An access node of a radio access network that communicates over a radio interface with a wireless terminal.” In particular, Brismar discloses that “a method is implemented by a network node in a wireless communication network for transmitting system information to a plurality of wireless terminals. According to the method, the network node transmits a first group of SIBs via a first physical channel, and transmits a second group of additional SIBs via a different, second physical channel.” EX. 1005 at [0022].

145. Brismar additionally discloses that, “a method is implemented by a wireless terminal in a wireless communication network for processing system information. The wireless terminal processes information received from a base station over a first physical channel to identify a first group of SIBs, and also processes information received from the base station over a different, second physical channel to identify a second group of additional SIBs.” *Id.* at [0028].

146. Thus, Brismar discloses “an access node of a radio access network that communicates over a radio interface with a wireless terminal.” EX. 1001 at Claim

1.

[1a] processor circuitry configured:

147. Brismar teaches “processor circuitry configured” to perform the functionality claimed in Claim 1.

148. Brismar teaches that in Figure 18B (reproduced below), “the components of the network node need not be implemented strictly in hardware. It is envisioned that the components can be implemented through any combination of hardware and software. For example, as illustrated in FIG. 18 b, the network node may include one or more hardware processors, one or more storages (internal, external, both), and one or both of a wireless interface (in case of a radio node) and a network interface.” *Id.* at [0201]. Brismar further teaches that “the processor(s) may be configured to execute program instructions to perform the functions of one or more of the network node components. The instructions may be stored in a non-transitory storage medium or in firmware (e.g., ROM, RAM, Flash) (denoted as storage(s)).” *Id.* at [0202].

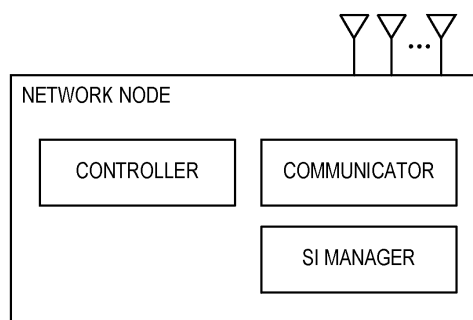


FIG. 18A

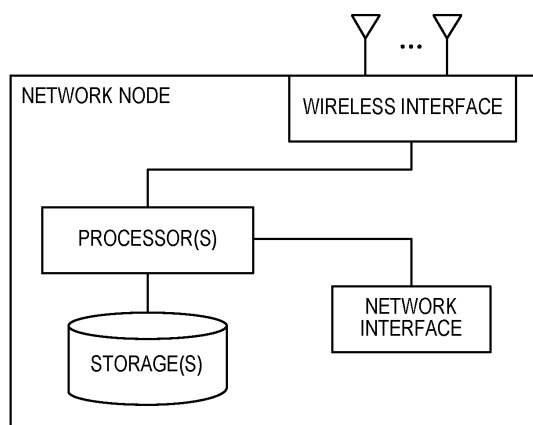


FIG. 18B

Id. at Fig. 18, [0205].

149. This is similarly illustrated in Figure 19B, reproduced below, depicting similar features of the wireless terminal, including the wireless terminal processor(s).

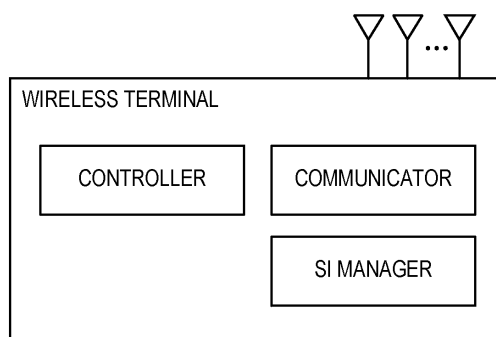


FIG. 19A

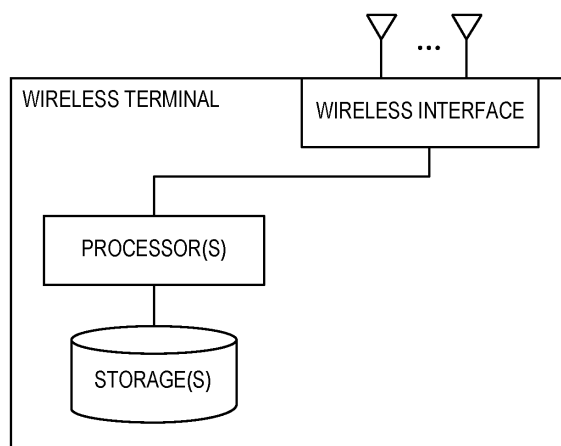


FIG. 19B

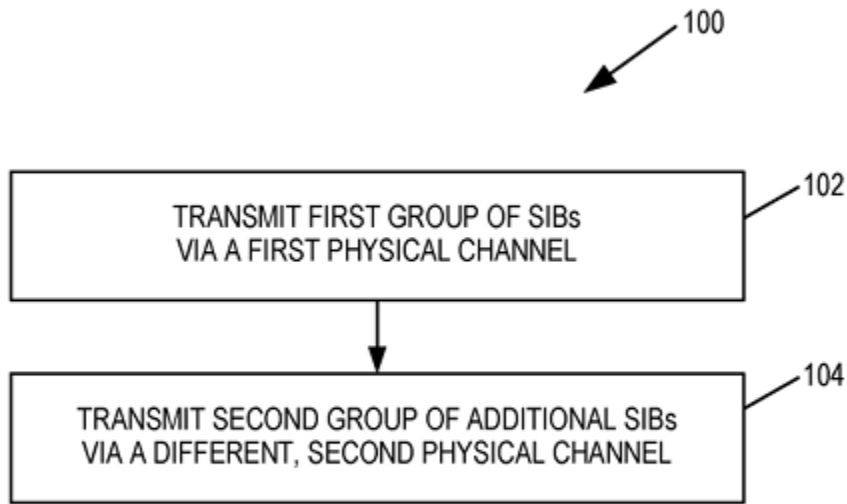
Id. at Fig. 19B, [0205].

150. Thus, Brismar teaches element “processor circuitry configured” to perform the functionality of Claim 1. EX. 1001 at Claim 1.

[1b] to generate a first type system information block (SIB) comprising information and a value tag, the information indicating whether one or more associated second type system information blocks are provided by broadcast or on-demand, the value tag being updated upon a change of a corresponding second type SIB, the first type SIB being required for the wireless terminal to perform an initial access to the radio access network;

151. Brismar teaches processor circuitry configured to “to generate a first type system information block (SIB) comprising information and a value tag, the information indicating whether one or more associated second type system information blocks are provided by broadcast or on-demand, the value tag being updated upon a change of a corresponding second type SIB, the first type SIB being required for the wireless terminal to perform an initial access to the radio access network”

152. Firstly, Brismar discloses “generating a first type of information block.” As illustrated in Figure 16, reproduced below, Brismar teaches “an example method 100 implemented by a network node in a wireless communication network of transmitting system information to a plurality of wireless terminals. According to the method 100, the network node transmits a first group of SIBs via a first physical channel (block 102), and transmits a second group of additional SIBs via a different, second physical channel (block 104).” *Id.* at [0183].

**FIG. 16**

Id. at Fig. 16, [0183].

153. Brismar further discloses that “the method 100 also includes the network node transmitting, via the first physical channel, scheduling information for reception of the additional SIBs on the second physical channel (see, e.g., FIG. 2 a). The scheduling information may be included in a scheduling block transmitted via the first physical channel (e.g., SB-BC1 in FIG. 2 a).” *Id.* at [0185].

154. Brismar distinguishes the SIBs depending on whether they contain static or dynamic information. *Id.* at [0012]. So, looking to Brismar’s disclosure in [0185], in my opinion the SIBs containing static information would correspond to the first group of SIBs, or the first type system information block. Further, the SIBs containing dynamic information would correspond to the second group of SIBs, or

the second type system information block. For ease of reference, I have included this mapping of Brismar's disclosure to the Claim limitation as illustrated in the table below.

System Information Block Type from the Challenged Claims	Brismar's Disclosure
First Type SIB	SIB containing static information
Second Type SIB	SIB containing dynamic information

155. The first type SIBs are transmitted on a broadcast channel using the same repetition period. For example, Brismar explains that "FIG. 5b illustrates an example of a method performed by a network node (e.g., RNC, RBS) to distribute system information using the SIB of FIG. 5 a. Grouping all static data in the same SIB implies that the information is transmitted on the broadcast channel using the same repetition period. This can be acceptable since in most cases, there may be little to no benefit in getting a subset of the static BC2 information before the UE has been able to read all legacy information on BC1. Thus, the SIB-S acquisition is not time critical and the repetition period can be set to the largest possible value that matches the time it takes for the UE to read the legacy SIBs on BC1." *Id.* at [0103]. Figure 5B is reproduced below for reference.

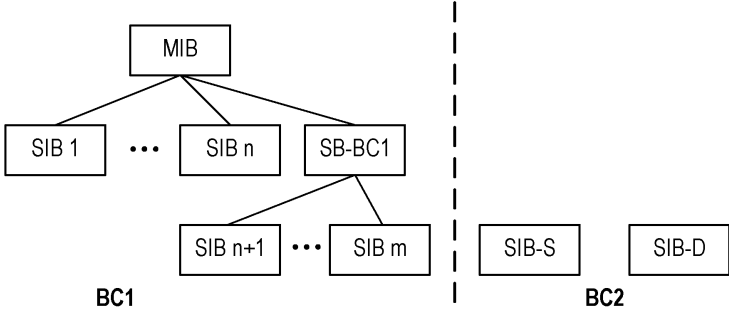


FIG. 5A

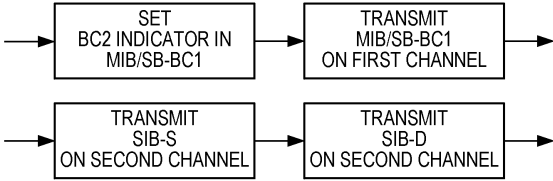


FIG. 5B

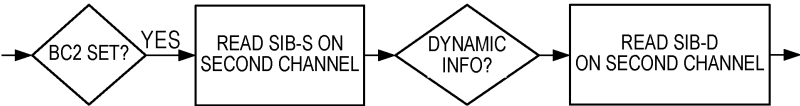


FIG. 5C

Id. at Fig. 5.

156. Brismar further teaches that when the static information is grouped in the same SIB, the UE reads all SIB segments in order to decode the information, including information related to non-supported features, or other RRC states. However, the SIB-S data is only acquired by the UE when a new cell is entered (and no stored information with matching value tag exists), or when the SIB-S content is

changed. Thus, the additional cost to read more information than needed can be neglected.” *Id.* at [0104]. Therefore, in my opinion, to the extent that Brismar does not expressly disclose that the first type SIB is required for a wireless terminal to perform initial access to a network, a POSITA would understand that the static data included in the first type SIB would be required for the UE in order to obtain network access.

157. Brismar also teaches that for the SIBs containing static information, or the first type SIBs recited in the Challenged Claims, the SIB includes scheduling information and “a value tag ... used to indicate when there is a need for the UE to read new information on the broadcast channel.” *Id.* When SIB content is modified, the corresponding value tag is updated. *Id.* The value tag may be included in Paging Type 1 and System Information Change Indication messages. *Id.* at [0109].

158. Brismar also discloses an alternative to broadcasting SI, wherein SI may be requested by the UE (e.g., on-demand). *Id.* at [0125]. Specifically, “In this alternative, the system information is not sent periodically on the broadcast channel. Rather, UE may request the information, e.g., when entering a new cell for which the UE has no stored information. This scheduling option makes it possible to use a more aggressive DTX scheme as the information may be sent only when a UE needs it. The UE may request the system information using different means. Examples of such means are described below.” *Id.* Therefore, the second type SIB may be

provided by broadcast or on-demand.

159. Brismar additionally discloses that “as soon as a UE is missing SIB information because it has never been read or the value tag has changed, the UE may be required to first monitor the SI distribution in progress flag, and if SI distribution is not already in progress (or soon to start), the UE then may send its SI distribution request.” *Id.* at [0173]. A POSITA would have understood this distribution in progress flag to be an indication of whether the second type SIBs are currently being broadcast or need to be requested. Brismar teaches that the distribution in progress flag is distributed on the first physical channel, the same physical channel reserved for the first type SIB. EX. 1005 at [0177] (stating that the SI distribution in progress flag is mapped to the P-CCPCH), [0184] and [0192] (stating that the first physical channel, the P-CCPCH, is used to distribute the legacy SIBs, which would be the static, first type of SIB). A POSITA would understand the distribution in progress flag is transmitted in the same physical control channel as the static system information identified as the first type of SIB. Additionally, a POSITA would have considered it obvious to include the information provided by the distribution in progress flag in the SIB transmitted on the same P-CCPCH channel as the flag. The distribution in progress flag is a control signal related to system information. In addition, since system information blocks are subject to channel coding, including the distribution in progress flag in a system information block would make it more

resilient to noise and interference in the downlink channel to the UE.

160. Thus, Brismar discloses generating “a first type system information block (SIB) comprising information and a value tag, the information indicating whether one or more associated second type system information blocks are provided by broadcast or on-demand, the value tag being updated upon a change of a corresponding second type SIB, the first type SIB being required for the wireless terminal to perform an initial access to the radio access network.” EX. 1001 at Claim 1.

[1c] upon a change of a second type SIB whose associated information indicated before the change that the second type SIB was provided on-demand, to include in the first type SIB the information associated with the second type SIB indicating that the second type SIB is provided by broadcast;

161. Brismar discloses and/or renders obvious that “upon a change of a second type SIB whose associated information indicated before the change that the second type SIB was provided on-demand, to include in the first type SIB the information associated with the second type SIB indicating that the second type SIB is provided by broadcast.” Brismar teaches that a “value tag may be sent to the UE whenever the content of a BC2 SIB is modified. At a reception of the notification (e.g., on PCH, or FACH/HS-DSCH), the UE may check the SB-BC2 and compare the new value tags for the BC2 SIBs with the stored ones. If they differ the UE may reacquire the modified SIB.” *Id.* at [0097]. In my opinion, A POSITA would

understand that a change in the value tag indicates a change of second type SIB. In turn, a POSITA would understand that this would require retransmission of the second type SIB, so that the UE has the most up-to-date system information. There would be no need for the system to include a value tag to indicate a change in system information, but for providing the most up to date system information and putting the UE on notice that such system information had changed.

162. Brismar additionally discloses that “as soon as a UE is missing SIB information because it has never been read or the value tag has changed, the UE may be required to first monitor the SI distribution in progress flag, and if SI distribution is not already in progress (or soon to start), the UE then may send its SI distribution request.” *Id.* at [0173]. In my opinion, a POSITA would understand that the distribution in progress flag regarding SI distribution progress would have to be transferred on the static SIB (e.g., the first type SIB). *See Supra* Section X.B.1.(a)[1b].

163. In other words, a POSITA would understand that the distribution in progress flag indicates whether the transmission is either in process (broadcast) or on-demand. Therefore, when the value tag is changed, the UE may request SI distribution in a scenario when the distribution is not already in progress. In my opinion, a POSITA would understand that in the alternative to this scenario, the SI distribution is broadcast, because in order for the SI to be distributed without request

by the UE, it must be broadcast. When the value tag corresponding to the second type SIB is changed, this information is sent to the UE, who is then alerted to read and store the updated version of the second type SIB.

164. In my opinion, if the Board finds that Brismar does not expressly disclose limitation [1c], it would be obvious to a POSITA based on Brismar's disclosures. In particular, a POSITA would find it obvious that, if a value tag indicates that the second type SIB has changed, the UE would need to know this information in order to know to receive the changed SI. Because the first type SIB is broadcast, it would logically follow that the first type SIB would be responsible for communicating that the changed system information will now be broadcast, in addition to providing the updated value tag. The UEs otherwise do not know that they are in need of this SI in order to then receive it.

165. In my opinion, a POSITA would interpret and/or modify Brismar's disclosure in light of their own knowledge, because the UE would necessarily require an indication that the changed system information is now broadcast in order to know to receive it. Otherwise, the UE would have no way to know that they need to do as so.

166. Thus, Brismar, or Brismar in view of the knowledge of a POSITA, discloses "upon a change of a second type SIB whose associated information indicated before the change that the second type SIB was provided on-demand, to

include in the first type SIB the information associated with the second type SIB indicating that the second type SIB is provided by broadcast.” EX. 1001 at Claim 1.

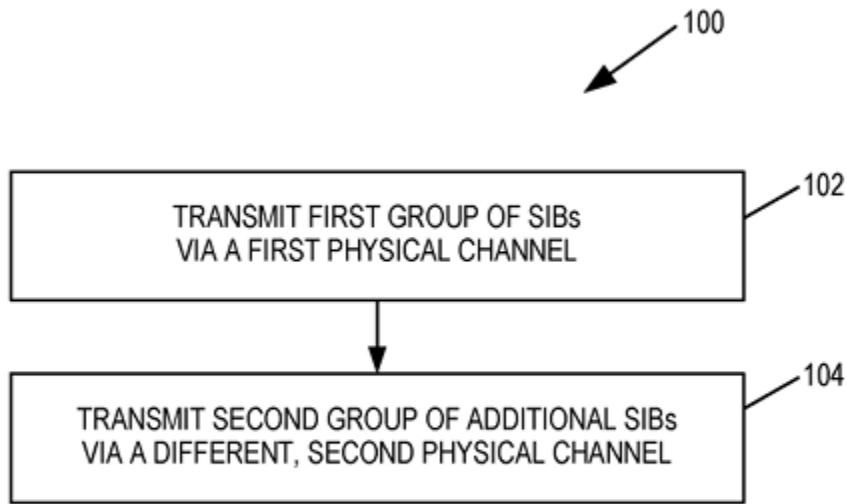
[1d] transmitter circuitry configured to:

167. Brismar teaches this limitation or renders it obvious. In particular Brismar discloses that the network node may transmit system information. *Id.* at [0209]. In my opinion, a POSITA would understand that this transmission would necessarily require transmitter circuitry. Without transmitter circuitry, the network node would not be able to transmit system information.

168. Thus, Brismar teaches “transmitter circuitry configured” to perform the functionality of Claim 1. EX. 1001 at Claim 1.

[1e] transmit the first type SIB;

169. Brismar teaches transmitter circuitry configured to “transmit the first type SIB.” For example, Brismar illustrated in Figure 16, reproduced below, and discloses “an example method 100 implemented by a network node in a wireless communication network of transmitting system information to a plurality of wireless terminals. According to the method 100, the network node transmits a first group of SIBs via a first physical channel (block 102), and transmits a second group of additional SIBs via a different, second physical channel (block 104).” *Id.* at [0183].

**FIG. 16**

Id. at Figure 16.

170. At step 102 of Figure 16, the system of Brismar transmits a first group (type) of SIBs. Thus, Brismar teaches “transmit[ing] the first type SIB.” EX. 1001 at Claim 1.

[1f] transmit a message that triggers the wireless terminal to receive the first type SIB, wherein;

171. Brismar teaches transmitter circuitry configured to “transmit a message that triggers the wireless terminal to receive the first type SIB.” Brismar discloses a “method performed by the UE to access the SIB of FIG. 4 a on a second distributions channel. In this third embodiment, the legacy update mechanisms can be reused to some extent. However, a new SB-BC2 value tag may be included in the Paging Type 1 and System Information Change Indication messages. This value tag may be sent

to the UE whenever the content of a BC2 SIB is modified. At reception of the notification (e.g., on PCH, or FACH/HS-DSCH), the UE may check the SB-BC2 and compare the new value tags for the BC2 SIBs with the stored ones. If they differ the UE may reacquire the modified SIB.” *Id.* at [0097]. A POSITA would understand that the Paging Type 1 message disclosed by Brismar triggers the wireless terminal to receive the first type SIB.

172. Thus, Brismar discloses “transmit[ing] message that triggers the wireless terminal to receive the first type SIB, wherein;” EX. 1001 at Claim 1.

[1g] whether or not the second type SIB has changed is determined based on a value tag, associated with the second type SIB, stored in the wireless terminal, and the value tag included in the first type SIB corresponding to the second type SIB.

173. Brismar discloses that “whether or not the second type SIB has changed is determined based on a value tag, associated with the second type SIB, stored in the wireless terminal, and the value tag included in the first type SIB corresponding to the second type SIB.” As discussed above, Brismar discloses that for the second type SIB, the value tag indicating that the second type SIB has changes is included in the Paging Type 1/System Information Change Indication messages. *Id.* at [0097]. Brismar teaches that the value tag indicates whether the second type SIBs have changed. *Id.* For example, when the UE receives the message, the UE compares the new value tags for the second type SIBs, and in scenarios where

the value tags have changed, the UE then reacquired (by broadcast or on-demand) the changed SI. *Id.*

174. Thus, Brismar teaches that “whether or not the second type SIB has changed is determined based on a value tag, associated with the second type SIB, stored in the wireless terminal, and the value tag included in the first type SIB corresponding to the second type SIB.” EX. 1001 at Claim 1.

b) Claim 2: The access node of Claim 1, wherein the transmitter circuitry is further configured to transmit the second type SIB by broadcast after the change.

175. Brismar teaches the access node of Claim 1 as explained above, wherein “wherein the transmitter circuitry is further configured to transmit the second type SIB by broadcast after the change.” As discussed above, when the UE checks and compares the new value tags it receives with the stored ones, the UE learns of any changed updated system information if the value tag has changed. In this instance, the UE will reacquire the changed second type SIB. *See supra* cite; EX. 1005 at [0097].

176. Brismar additionally discloses that “as soon as a UE is missing SIB information because it has never been read or the value tag has changed, the UE may be required to first monitor the SI distribution in progress flag, and if SI distribution is not already in progress (or soon to start), the UE then may send its SI distribution request.” *Id.* at [0173]. In other words, if a distribution of the changed SI is already

in progress, the second type SIB is broadcast after the change.

177. Figure 12, reproduced below, “indicates one repetition of the SI after reception of the SI distribution request, and that the SI distribution in progress flag is cleared after all repetitions of requested SIs are finished. It is also possible to envision that the flag should be cleared as soon as the last transmission of a particular SI part is finished, to enable UEs that missed the earlier parts (that will not be repeated) to request them as soon as possible.” *Id.* at [0174].

Id. at Figure 12.

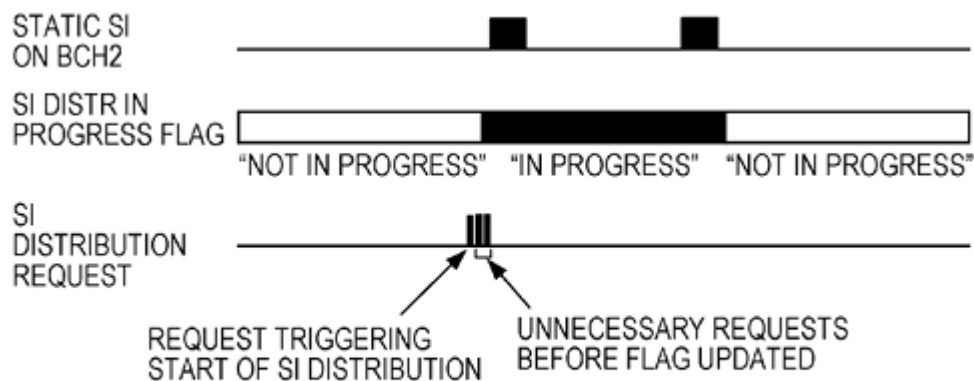


FIG. 12

178. Thus, Brismar discloses that the transmitter circuitry is “further configured to transmit the second type SIB by broadcast after the change.” EX. 1001 at Claim 2.

e) Claim 3

179. As indicated above, in my opinion, Claim 3 is substantively the same as Claim 1, but is directed to a method for an access node of a radio access network

rather than the access node itself. Claim 3's limitations, where not identical to Claim 1's limitations, recite the step the corresponding limitation requires the access node to be configured to perform the recited function.

180. Therefore, as with Lee above, the same teachings of Brismar that anticipate and/or render the limitations of Claim 1 obvious, anticipate and/or render the same limitations in Claim 3 obvious, as it is obvious both to configure an access node to perform a step and to have the access node actually perform the step.

[3pre] A method for an access node of a radio access network that communicates over a radio interface with a wireless terminal, the method comprising:

181. As discussed above, limitation [1pre] recites an "access node of a radio access network that communicates over a radio interface with a wireless terminal." Limitation [3pre] recites a "method for an access node of a radio access network that communicates over a radio interface with a wireless terminal." For the same reasons as I described with respect to limitation [1pre], the same disclosures and analysis regarding Brismar renders limitation [3pre] anticipated and/or obvious.

[3a] generating a first type system information block (SIB) comprising information and a value tag, the information indicating whether one or more associated second type system information blocks are provided by broadcast or on-demand, the value tag being updated upon a change of a corresponding second type SIB, the first type SIB being required for the wireless terminal to perform an initial access to the radio access network;

182. Limitation [1b] recites “transmitting circuitry configured to transmit” the same first type SIB with the some requirements. Limitation [3a] similarly recites “generating a first type system information block” with the same requirements. For the same reasons as I described with respect to limitation [1b], the same disclosures and analysis regarding Brismar renders limitation [3a] anticipated and/or obvious.

[3b] upon a change of a second type SIB whose associated information indicated before the change that the second type SIB was provided on-demand, including in the first type SIB the information associated with the second type SIB indicating that the second type SIB is provided by broadcast;

183. Limitation [1c] recites “including in the first type system information block” certain information “upon a change of a second type SIB.” Limitation [3b] similarly recites “including in the first type system information block” the same information “upon a change of a second type SIB.” For the same reasons as I described with respect to limitation [1c], the same disclosures and analysis regarding Brismar renders limitation [3b] anticipated and/or obvious.

[3c] transmitting the first type SIB;

184. Limitation [1e] recites “transmitting circuitry configured to transmit” the first type SIB. Limitation [3c] similarly recites “transmitting the first type SIB.” For the same reasons as I described with respect to limitation [1e], the same disclosures and analysis regarding Brismar renders limitation [3c] anticipated and/or obvious.

[3d] transmitting a message that triggers the wireless terminal to receive the first type SIB, wherein;

185. Limitation [3d] recites “transmitting a message that triggers the wireless terminal to receive the first type SIB,” while limitation [1f] recites “transmitting circuitry configured to transmit” the same message. For the same reasons as I described with respect to limitation [1f], the same disclosures and analysis regarding Brismar renders limitation [3d] anticipated and/or obvious.

[3e] whether or not the second type SIB has changed is determined based on a value tag, associated with the second type SIB, stored in the wireless terminal, and the value tag included in the first type SIB corresponding to the second type SIB.

186. Limitation [1g] is the same as limitation [3e] verbatim. For the same reasons as I described with limitation [1g], the same disclosures and analysis render limitation [3e] obvious.

f) Claim 4: The method of claim 3, further comprising transmitting the second type SIB by broadcast after the change.

187. As with Claim 3, Claim 4 is substantively the same as Claim 2, but dependent on the recitation of the method steps of Claim 3. Claim 4's limitations, where not identical to Claim 2's limitations, recite the step the corresponding limitation requires the access node to be configured to perform the recited functions. The same teachings of Brismar that anticipate and/or render the limitations of Claim 2 obvious, anticipate and/or render the same limitations in Claim 4 obvious, as it is obvious both to configure an access node to perform a step and to have the access node actually perform the step.

XI. CONCLUSION

188. The Challenged Claims simply recite concepts known in the art at the time. Thus, the Challenged Claims were either anticipated or rendered obvious by the prior art. Based on my experience, knowledge of the field at the relevant time, and a thorough analysis of prior art references, it is my expert opinion that the Challenged Claims of the '958 Patent are unpatentable.

Date: January 7, 2024

Executed: Wayne E. Stark