

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

SECOND DECLARATION OF DR. WAYNE STARK

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I, Dr. Wayne Stark, declare as follows:

II. 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 Substitute Claims 7-10 Proposed by Patent Owner for the ’958 Patent (“the Substitute Claims”). The Substitute Claims are reproduced below:

Ref	Limitation
7pre	7. (proposed substitute for claim 1) An access node of a radio access network that communicates over a radio interface with a wireless terminal, the access node comprising:
7a	processor circuitry configured:
7b	to generate a first type system information block (SIB) comprising information and a value tag <u>associated with a group of plural second type system information blocks fewer than the total number of second type information blocks, wherein each of the second type information blocks in the group has different sibIDs and the group has a group identifier</u> , 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 <u>belonging to the group</u> , the first type SIB being required for the wireless terminal to perform an initial access to the radio access network;
7c	upon a change of a second type SIB <u>belonging to the group</u> whose associated information indicated before the change that <u>the group containing</u> the second type SIB was provided on-demand, to include in the first type SIB the information associated with <u>the group containing</u> the second type SIB indicating that <u>the group containing</u> the second type SIB is provided by broadcast;
7d	transmitter circuitry configured to:
7e	transmit the first type SIB;

Ref	Limitation
7f	transmit a message that triggers the wireless terminal to receive the first type SIB, wherein;
7g	whether or not the group containing the second type SIB has changed is determined based on a value tag, associated with the group containing the second type SIB, stored in the wireless terminal, and the value tag included in the first type SIB corresponding to the group containing the second type SIB.
8	8. (proposed substitute for claim 2) The access node of claim [[1]]7 , wherein the transmitter circuitry is further configured to transmit the group identifier and the group containing the second type SIB by broadcast after the change.
9pre	9. (proposed substitute for claim 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:
9a	generating a first type system information block (SIB) comprising information and a value tag associated with a group of plural second type system information blocks fewer than the total number of second type information blocks, wherein each of the second type information blocks in the group has different sibIDs and the group has a group identifier , 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 belonging to the group , the first type SIB being required for the wireless terminal to perform an initial access to the radio access network;
9b	upon a change of a second type SIB belonging to the group whose associated information indicated before the change that the group containing the second type SIB was provided on-demand, including in the first type SIB the information associated with the group containing the second type SIB indicating that the group containing the second type SIB is provided by broadcast;
9c	transmitting the first type SIB;
9d	transmitting a message that triggers the wireless terminal to receive the first type SIB, wherein;

Ref	Limitation
9e	whether or not <u>the group containing</u> the second type SIB has changed is determined based on a value tag, associated with <u>the group containing</u> the second type SIB, stored in the wireless terminal, and the value tag included in the first type SIB corresponding to <u>the group containing</u> the second type SIB.
10	10. (proposed substitute for claim 4) The method of claim [[3]] 9, further comprising transmitting <u>the group identifier and the group containing</u> the second type SIB by broadcast after the change.

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 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 Substitute Claims of the '958 Patent are unpatentable over the prior art references discussed below. Further, for the reasons set out below, it is my opinion that the substitute claims improperly broaden the scope of the original claims, and are not proper substitute claims.

III. QUALIFICATIONS

5. I provided a summary of my qualifications and experience in my first declaration in this proceeding. Ex-1002 ¶¶ 5-15. I incorporate my first declaration in this matter (Ex. 1002) by reference.

IV. MATERIALS REVIEWED AND CONSIDERED

6. 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. 1002	Expert Declaration of Dr. Wayne Stark
EX. 1003	Curriculum Vitae of Dr. Wayne Stark
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”)
EX. 1007	16/597,325 Application that issued as ’958 Patent (“’325 App.”) File History
EX. 1008	U.S. Pat. Publication No. 2017/0251500 (“Agiwal”)
EX. 1009	Provisional Patent Application No. 62/334,706 (“Agiwal Provisional”)
Ex. 1011	Deposition Transcript of Dr. Karthik Sundaresan, taken Dec. 13, 2024
	Institution Decision (Paper 12)
	Patent Owner’s Non-Contingent Motion to Amend (Paper 20)
EX. 2006	Second Declaration of Dr. Karthikeyan Sundaresan

V. MY UNDERSTANDING OF CERTAIN PATENT LAW PRINCIPLES

7. I applied the same legal understanding set forth in my first declaration in this proceeding. Ex-1002 ¶¶ 17-29. Additionally, I understand that a substitute claim in an IPR proceeding cannot broaden the original claim. I understand that, in this context, a substitute claim is considered broader than an original claim if it could conceivably cover subject matter not covered by the original claim. That a substitute claim may also no longer cover subject matter covered by the original claim does not mean the substitute claim is not broader than the original claim. In other words, a substitute claim is broader, even if it covers less total subject matter, if it covers any new subject matter.

8. I also understand that a substitute claim in an IPR may be denied patentability on any basis, not just the grounds raised in the petition or grounds limited to patents or publications. For example, a substitute claim may be found not to be patentable on the basis of indefiniteness. I understand a claim is indefinite if it fails to inform a person of skill in the art of the boundary of the claim with reasonable certainty. I understand that this may occur, for example, if a claim lacks an objective boundary because its interpretation is subjective, the claim may be indefinite.

VI. LEVEL OF ORDINARY SKILL IN THE ART

9. I applied the same level of ordinary skill in the art applied by the Board

in its institution decision. Paper 12 at 6-7. My conclusions and opinions would be the same if applying the level of ordinary skill set out in my first declaration in this proceeding. Ex-1002 ¶¶ 30-35. Additionally, if the level of ordinary skill were two rather than three years of work experience in a relevant technical field, my opinions would be the same.

VII. TECHNICAL BACKGROUND

10. The technical background set forth in my first declaration in this proceeding is equally applicable to the Substitute Claims. Ex-1002 ¶¶ 36-47.

VIII. OVERVIEW OF THE '958 PATENT

11. The overview of the '958 Patent set forth in my first declaration in this proceeding is equally applicable to the Substitute Claims. Ex-1002 ¶¶ 48-52.

IX. OVERVIEW OF THE SUBSTITUTE CLAIMS

12. The Substitute Claims add the concept of grouping second type SIBs and using value tags for groups of second type SIBs rather than individual second type SIBs.

13. In limitation 7b, Patent Owner adds the requirements that: (1) the claimed value tag be associated with a group of two or more second type SIBs, and less than all of the second type SIBs, (2) that the SIBs have an identifier, and (3) that the group have an identifier. Similar additions are present in limitation 9a. This alters the scope of original claim elements 1b and 3a by requiring second type SIBs

to be identifiable, requiring at least some second type SIBs to be grouped, and requiring the value tag to apply to a group of second type SIBs rather than an individual second type SIB.

14. In limitation 7c, Patent Owner amends the requirement that a second type SIB be switched from on-demand to broadcast upon a change of the second type SIB to a requirement that the group containing the second type SIB be changed from on-demand to broadcast when a second type SIB in a group changes. Similar additions are present in limitation 9b. This alters the scope of original claim elements 1c and 3b by requiring the group of second-type SIBs to shift from on-demand to broadcast following a change of one of its SIBs.

15. In limitation 7g, Patent Owner amends the requirement of limitation 1g that whether the second type SIB has changed is determined based on a value tag to the requirement that whether the group containing the second type SIB has changed is determined based on a value tag. Similar additions are present in limitation 9e. This alters the scope of original claim elements 1g and 3e by requiring that whether a group of SIBs has changed rather than whether a particular SIB has changed, be determined from a value tag.

16. In limitation 8, Patent Owner amends the requirement that the second type SIB be transmitted after the change to require that the group identifier and the

group including the second type SIB be transmitted after the change.

Ref	Limitation (Limitations Without Additions Omitted)
7b	to generate a first type system information block (SIB) comprising information and a value tag <u>associated with a group of plural second type system information blocks fewer than the total number of second type information blocks, wherein each of the second type information blocks in the group has different sibIDs and the group has a group identifier</u> , 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 <u>belonging to the group</u> , the first type SIB being required for the wireless terminal to perform an initial access to the radio access network;
7c	upon a change of a second type SIB <u>belonging to the group</u> whose associated information indicated before the change that <u>the group containing</u> the second type SIB was provided on-demand, to include in the first type SIB the information associated with <u>the group containing</u> the second type SIB indicating that <u>the group containing</u> the second type SIB is provided by broadcast;
7g	whether or not <u>the group containing</u> the second type SIB has changed is determined based on a value tag, associated with <u>the group containing</u> the second type SIB, stored in the wireless terminal, and the value tag included in the first type SIB corresponding to <u>the group containing</u> the second type SIB.
8	8. (proposed substitute for claim 2) The access node of claim ~~[[1]]~~ 7, wherein the transmitter circuitry is further configured to transmit <u>the group identifier and the group containing</u> the second type SIB by broadcast after the change.

17. Substitute Claims 9 and 10 have substantively the same changes as Substitute Claims 7 and 8.

X. CLAIM CONSTRUCTION

18. 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 Substitute 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.

XI. PRIOR ART

A. Lee

1. Overview of Lee

19. I incorporate my overview of Lee from my first declaration in this proceeding. Ex-1002 ¶¶ 54-72.

20. As discussed in my opening report, Lee generally discloses techniques for “requesting a system information block,” particularly for requesting missing system information. “The missing SIB may be an SIB that the UE needs to read due to a supported feature. For example, the supported feature may be MBMS, D2D, V2X, or WLAN.” Ex. 1004 at [0123], [0177]. “[W]hen the missing SIB is detected, the UE may transmit a system information request indicating the missing SIB to the RAN. Alternatively, the system information request may indicate a feature associated with the missing SIB. For example, the feature associated with the missing SIB may be MBMS, D2D, V2X, or WLAN.” *Id* at [0124].

21. Lee discloses the base station sending “polling information.” The RAN

may trigger one or more system information requests from one or more UEs in the cell by transmitting SI polling information through UE-dedicated signaling.” *Id* at [0126]. Polling information “may include a value tag indicating system information to be transmitted when the UE requests system information.” *Id* at [0134]. The base station polling information “may include the number of the type of a system information block to be transmitted when the UE requests system information.” *Id* at [0137]. “The SI polling information may include a set of system information blocks to be transmitted when the UE requests system information.” *Id* at [0140]. “The UE may receive, from the RAN, a set of SIBs to be requested from the RAN. In this case, when the missing SIB is included in the set of SIBs to be requested, the missing SIB may be requested from the RAN. *Id* at [0182].

22. Lee 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... This indication may include a value tag for a particular type of system information or a common value tag for all system information.” *Id* at [0168]. “The UE may receive, from the RAN, a number of the type of an SIB to be requested from the RAN. In this case, when the missing SIB matches the number of the type of the SIB to be requested, the missing SIB may be requested from the RAN.” *Id* at [0181]. [W]hen the UE has already stored a system information block type corresponding to the number of the system information block type for the cell, the UE does not request

system information.” *Id* at [0138].

2. Lee is Entitled to its Provisional Filing Date

23. I incorporate my analysis of Lee’s provisional application from my first declaration in this proceeding. Ex-1002 ¶¶ 73-76. Additionally, the subject matter relevant to the amendments made in the substitute claims was also disclosed in Lee’s provisional application.

Subject Matter from Lee Cited Below	Supporting Corresponding Subject Matter in Lee Provisional (Ex. 1006)
[0003]	In the inventions, RAN is LTE base station i.e. eNB or replaced by a New RAT based station possibly including Central Unit and/or Distributed Unit(s). The RAN manages a cell. Page 34 “The problem of the prior art is that when UE frequently requests system information, uplink is congested.” Page 33
[0017-0018]	“SIBs other than SystemInformationBlockType1 are carried in SystemInformation (SI) messages and mapping of SIBs to SI messages is flexibly configurable by schedulingInfoList included in SystemInformationBlockType1, 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;” Page 2. “The SI request can include one or more of the following elements: - The value tag indicating system information currently stored in the UE

Subject Matter from Lee Cited Below	Supporting Corresponding Subject Matter in Lee Provisional (Ex. 1006)
	- The number(s) of a system information block type on request - A set of system information blocks on request - UE Identity - Part of or full UE capability information - Support of a particular feature e.g. support of eMBMS, support of sidelink.” Page 34 “RAN triggers one or more SI request(s) from one or more UEs at a cell by sending SI polling information via UE dedicated signaling or broadcast signaling such as system information or paging message. The SI polling information includes one or more of the following elements:” “-The number(s) of a system information block type to be transmitted when UE requests SI”. Page 35.
[0071]	“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.” Page 37. A POSITA would understand the RAN broadcasting which SIB is supported indicates that there is an identifier with each SIB.
[0118], [0123-0126]	“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.” “Upon detecting a missing SIB that a UE should read e.g. due to a supported feature such as MBMS, D2D,

Subject Matter from Lee Cited Below	Supporting Corresponding Subject Matter in Lee Provisional (Ex. 1006)
	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. The SI request alternatively indicates the feature related to the missing SIB, e.g. MBMS, D2D, V2X or WLAN. Upon receiving the SI request, RAN sends necessary system information associated to the SI request to the UE via any downlink RRC message.” Page 37
[0134], [0137-0140]	Invention 3 as described on page 35, including the following: “The SI polling information includes one or more of the following elements: -The value tag indicating system information to be transmitted when UE requests SL -The number(s) of a system information block type to be transmitted when UE requests SLA set of system information blocks to be transmitted when UE requests SL
[0168-0182]	Inventions 4-6 as described on pages 37-38, including the following: “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. - 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

Subject Matter from Lee Cited Below	Supporting Corresponding Subject Matter in Lee Provisional (Ex. 1006)
	common for all SI or per SI. - The above indication may include a value Tag for a certain type of SI or common valueTag for all SI. - 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. When the UE is aware that system information is expected to be changed by the above method and the system information is to be broadcasted, the UE does not trigger SI request of on-demand SI. If network broadcasts only changed on-demand system information, and the UE requires other system information than changed on-demand system information, the UE is allowed to trigger SI request for a specific type of SI. Upon receiving the changed on-demand system information, UE overrides the stored configuration with the [new configuration]"

B. Agiwal

1. Overview of Agiwal

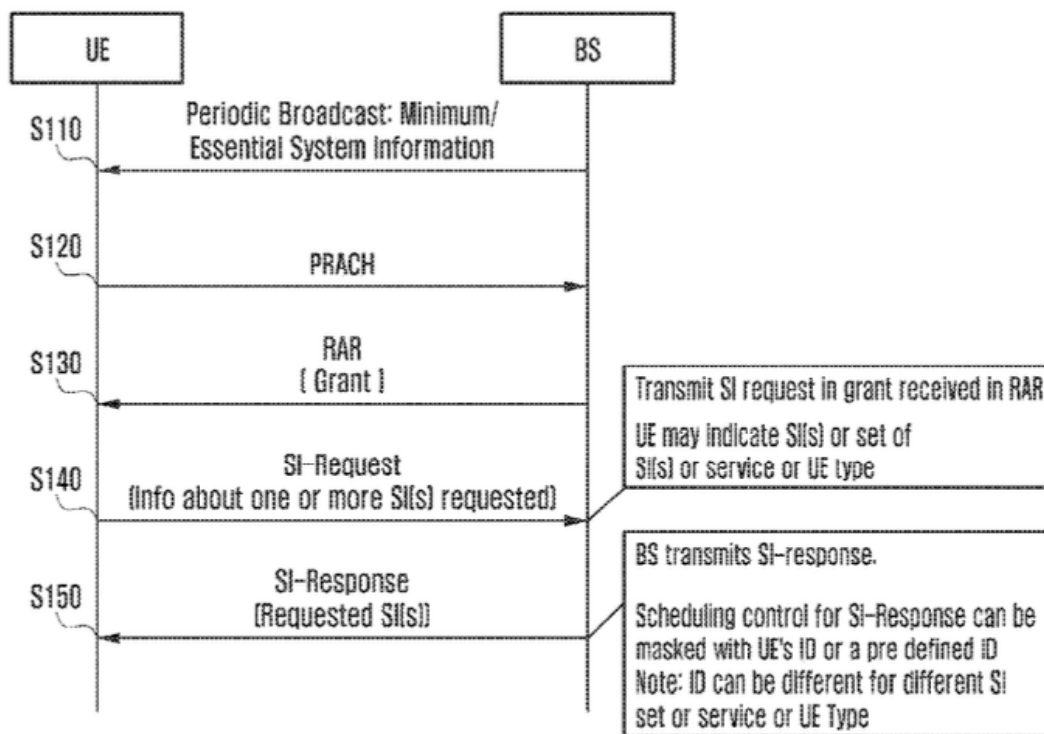
24. Agiwal is directed to wireless communications systems. EX. 1008 at [0002]. The problem addressed in Agiwal is the efficient transmission of system information. *Id.* at [0014, 0020]. Agiwal (Table 1) describes various system information blocks (SIB1-SIB19) of various lengths. The user equipment (UE)

needs to acquire various information blocks. Figure 1 of Agiwal, reproduced below, shows the method for the UE to acquire system information. “System information (SI) is categorized into two categories: The first category (also referred as minimum SI or essential SI) comprises of one or more system information which are broadcasted periodically by the cell and/or transport, routing, and packaging (TRP) information. The second category (also referred as Other SI) comprises of one or more system information which are provided on demand or can be broadcasted periodically.” *Id.* at [0048]. “Minimum SI or essential SI may include an indication which indicates that all SIs of second category of system information are periodically broadcasted or are provided on demand. Alternately, minimum SI or essential SI may include a separate indication for each SI (e.g. system information block (SIB)) or set of SIs (i.e. SIBs) wherein each indication indicates whether the associated SI or set of SIs are periodically broadcasted or are provided on demand.” *Id.* at [0052]. “In order to receive one or more system information provided on demand, in operation S120, UE transmits random access preamble (PRACH).” *Id.* at [0055]. “On receiving the random access preamble, in operation S130, BS transmits a random access response (RAR) and the RAR includes an uplink (UL) grant for transmitting the SI request message.” *Id.* at [0056]. The “UE validates that the RAR corresponds to PRACH transmitted by it. If the validation is successful, in operation S140, the UE transmits an SI request message in the UL grant. The SI request

message indicates one or more system information (e.g. SIBs) which UE needs or indicates one or more sets of system information which the UE needs or indicates service (e.g. enhanced mobile broadband (eMBB), mobile telecommunications company (MTC), ultra-reliable and low-latency (URLL), etc.) for which UE needs system information or UE type.” *Id.* at [0057] “In response to the SI request, in operation S150, BS transmits SI-response wherein the SI-response includes the requested system information. SI response can be broadcasted or provided in unicast manner. Scheduling control information indicating the SI-response can be masked with UE's ID (e.g. C-RNTI, RA-RNTI) or a pre-defined ID (e.g. system information-radio network temporary identifier (SI-RNTI)). Pre-defined ID can be different for different system information or system information set or service or UE type.” *Id.* at [0058].

25. One way that the “UE can be notified about system information update” disclosed by Agiwal is as follows. *Id.* at [0255]. The base station (BS) “broadcasts ValueTag/identifier/configuration index for each supported system information set/part/group. Change in value tag/identifier/configuration index corresponding to a system information set indicates that system information set/group/part is updated. Additionally BS may also broadcast change notification for each system information of a service.” *Id.* at [0256].

FIG. 1



2. Agiwal is Entitled to its Provisional Filing Date

Subject Matter from EX. 1008 Cited in Analysis Below	Supporting Corresponding Subject Matter in Agiwal Provisional (EX. 1009)
[0003] To meet the demand for wireless data traffic having increased since deployment of fourth generation (4G) communication systems, efforts have been made to develop an	Page 1 of 21, including: In the recent years several broadband wireless technologies have been developed to meet the growing number of broadband subscribers and to provide more and better applications and services. The second

Subject Matter from EX. 1008 Cited in Analysis Below	Supporting Corresponding Subject Matter in Agiwal Provisional (EX. 1009)
improved fifth generation (5G) or pre-5G communication system. Therefore, the 5G or pre-5G communication system is also called a 'Beyond 4G Network' or a 'Post long term evolution (LTE) System'. The 5G communication system is considered to be implemented in higher frequency (mmWave) bands, e.g., 60 GHz bands, so as to accomplish higher data rates. To decrease propagation loss of the radio waves and increase the transmission distance, the beamforming, massive multiple-input multiple-output (MIMO), full dimensional MIMO (FD-MIMO), array antenna, an analog beam forming, large scale antenna techniques are discussed in 5G communication systems. In addition, in 5G communication systems, development for system network improvement is under way based on advanced small cells, cloud radio access networks (RANs), ultra-dense networks, device-to-device (D2D) communication, wireless backhaul, moving network, cooperative communication, coordinated multi-points (CoMP), reception-end interference cancellation and the like. In the 5G system, hybrid frequency shift key (FSK) and quadrature amplitude modulation (QAM) modulation (FQAM) and	generation wireless communication system has been developed to provide voice services while ensuring the mobility of users. Third generation wireless communication system supports not only the voice service but also data service. In recent years, the fourth wireless communication system has been developed to provide high-speed data service. However, currently, the fourth generation wireless communication system suffers from lack of resources to meet the growing demand for high speed data services. So fifth generation wireless communication system is being developed to meet the growing demand for high speed data services, support ultra-reliability and low latency applications and support massive machine type communication.

Subject Matter from EX. 1008 Cited in Analysis Below	Supporting Corresponding Subject Matter in Agiwal Provisional (EX. 1009)
sliding window superposition coding (SWSC) as an advanced coding modulation (ACM), and filter bank multi carrier (FBMC), non-orthogonal multiple access (NOMA), and sparse code multiple access (SCMA) as an advanced access technology have been developed.	
[0013] One of the issues in current method of transmitting system information using the master information block (MIB)/system information blocks (SIBs) is that MIB/SIBs are periodically broadcasted irrespective of whether a user equipment (UE) is there in cell or not; whether any UE in cell needs that information. In case of small cell deployment, broadcasting all these SIBs periodically is unnecessary and leads to significant wastage of resources and increased energy consumption.	Page 2 of 21, including: One of the issues in current method of transmitting system information using the MIB/SIBs is that MIB/SIBs are periodically broadcasted irrespective of whether a UE is there in cell or not; whether any UE in cell needs that information. In case of small cell deployment, broadcasting all these SIBs periodically is unnecessary and leads to significant wastage of resources. So an enhanced method of signaling system information is needed.
[0048] System information (SI) is categorized into two categories: The first category (also referred as minimum SI or essential SI) comprises of one or more system information which are broadcasted periodically by the cell and/or transport, routing, and packaging (TRP) information. The second category (also referred as Other SI)	[Page 3] First category comprises of one or more System information which is broadcasted periodically by the cell and/or TRP. Second category comprises of one or more system information which is provided to UE on demand. First category comprises of essential system information. Essential system information is periodically broadcasted by the cell and/or TRP.

Subject Matter from EX. 1008 Cited in Analysis Below	Supporting Corresponding Subject Matter in Agiwal Provisional (EX. 1009)
comprises of one or more system information which are provided on demand or can be broadcasted periodically.	[Page 4] In one embodiment of proposed invention system information (other than essential system information) can also be broadcasted by the BS.
[0055] In order to receive one or more system information provided on demand, in operation S120, UE transmits random access preamble (PRACH). In an embodiment, PRACH preambles or PRACH opportunities (i.e. time/frequency resources) for requesting system information can be different from the PRACH preambles or PRACH opportunities for other purposes. This can minimize impact to random access load because of SI requests. PRACH preambles or PRACH opportunities (i.e. time/frequency resources) for obtaining system information can be predefined or signaled by network in first category (also referred as minimum SI or essential SI) of system information.	[Page 11] In order to receive the other system information, UE sends random access preamble (PRACH-SI). In one embodiment, PRACH-SI preamble for obtaining system information in RAR is pre-defined. In this option, PRACH time/frequency resource can be one of following: ■ Alt1: Fixed relative to PSS/SSS/BCH/SFN 0 ■ Alt2: Provided in essential system information ■ Alt3: Use normal PRACH time/frequency resource In another embodiment, PRACH-SI preamble for obtaining system information in RAR is not pre-defined. UE can use any PRACH preamble. In this option, PRACH time/frequency resource is specific to PRACH-SI and can be one of the following: ■ Alt1: Fixed relative to PSS/SSS/BCH/SFN 0 ■ Alt2: Provided in essential system information
[0056] On receiving the random access preamble, in operation S130,	[Page 12] On receiving the PRACH-SI, BS transmits a random access response. RAR

Subject Matter from EX. 1008 Cited in Analysis Below	Supporting Corresponding Subject Matter in Agiwal Provisional (EX. 1009)
BS transmits a random access response (RAR) and the RAR includes an uplink (UL) grant for transmitting the SI request message.	includes the other system information.
[0057] UE validates that the RAR corresponds to PRACH transmitted by it. If the validation is successful, in operation S140, the UE transmits an SI request message in the UL grant. The SI request message indicates one or more system information (e.g. SIBs) which UE needs or indicates one or more sets of system information which the UE needs or indicates service (e.g. enhanced mobile broadband (eMBB), mobile telecommunications company (MTC), ultra-reliable and low-latency (URLL), etc.) for which UE needs system information or UE type. UE may transmit its UE ID (i.e. SAE-temporary mobile subscriber identity (S-TMSI), cell-radio network temporary identifier (C-RNTI), random access-radio network temporary identifier (RA-RNTI), etc.) along with the SI request message.	[Page 3] UE validates that RAR corresponds to PRACH transmitted by it. If the validation is successful, UE transmits SI request message in the UL grant. SI request message indicates one or more system information which UE needs or indicates one or more set of system information which UE needs or indicates service (e.g. eMBB, MTC, URLL, etc) for which UE needs system information or UE type. UE may transmit its UE ID (i.e. S-TMSI, C-RNTI, RA-RNTI, etc) along with SI request message.
[0058] In response to the SI request, in operation S150, BS transmits SI-response wherein the SI-response includes the requested system information.	[Page 3] In response to SI request, ENB transmits SI-response wherein the SI-response includes the requested system information.

Subject Matter from EX. 1008 Cited in Analysis Below	Supporting Corresponding Subject Matter in Agiwal Provisional (EX. 1009)
[0066] FIG. 3 illustrates a method for categorizing system information parameters into SIBs according to another embodiment of the present disclosure. [0067] Referring to FIG. 3, system information parameters are categorized into SIBs. SIBs are then grouped into an SIB set (or SI message) wherein each set comprises one or more SIBs. [0068] An SIB can be present in more than one SIB set. Grouping of SIBs into SIB set can be done based on service (e.g. mobile broadband (MBB), URLL, mobile telecommunications company (MTC), device to device (D2D), D2Ddiscovery, D2D-Communication, vehicle-to-everything (V2X), vehicle-to-vehicle (V2V) etc.) or UE type (MTC UE, MBB UE, D2D UE, etc.).	Pages 4-5 of 21. In this method as illustrated in Figure 3, system information parameters are categorized into system information blocks. System information blocks are then grouped into system information block set wherein each set comprises of one or more system information blocks. A system information block can be present in more than one system information block set. Grouping of system information blocks into system information block set can be done based on service (e.g. MBB, URLL, MTC, D2D, D2D-discovery, D2D-Communication, V2X, V2V etc) or UE type (MTC UE, MBB UE, D2D UE, etc).
[0071] Referring to FIG. 4, system information parameters are categorized into system information set. Grouping of system information parameters into system information set can be done based on service (e.g. MBB, URLL, MTC, D2D, D2D-discovery, D2D-Communication, V2X, V2V etc.) or UE type (MTC UE, MBB UE, D2D UE, etc.). In SI request, a bitmap of size P bits is included wherein each bit	Page 5 of 21, including: In this method as illustrated in Figure 4, system information parameters are categorized into system information set. Grouping of system information parameters into system information set can be done based on service (e.g. MBB, URLL, MTC, D2D, D2D-discovery, D2D-Communication, V2X, V2V etc) or UE type (MTC UE, MBB UE, D2D UE, etc). In SI request a bitmap of size P bits is included wherein each bit corresponds to a system information set. Bit

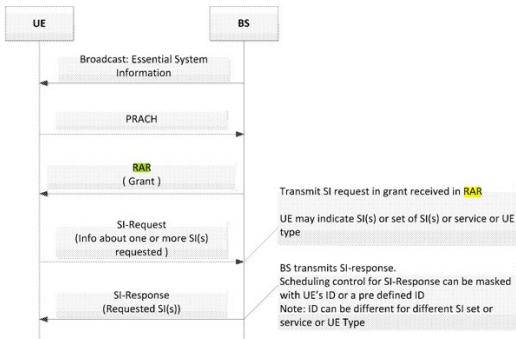
Subject Matter from EX. 1008 Cited in Analysis Below	Supporting Corresponding Subject Matter in Agiwal Provisional (EX. 1009)
corresponds to a system information set. Bit corresponding to system information set can be set to one to indicate that UE needs that system information set. Alternately, instead of bitmap, UE can include a list of SI sets in SI-request.	corresponding to system information set can be set to one to indicate that UE needs that system information set. Alternately, instead of bitmap, UE can include a list of SI sets in SI-request.
[0079] For example, in case of heterogeneous network comprises of macro cell and small cells, macro cell may indicate that system information is broadcasted whereas small cells may indicate that system information is not broadcasted. In another example, if there are several requests for system information provided on demand then network may start to broadcast the system information instead of providing on demand. Minimum SI or essential SI may include in indication which indicates that all Sis of second category of system information are periodically broadcasted or are provided on demand.	Page 7 of 21, including: In another embodiment of proposed invention the second category of system information can also be broadcasted by the BS. BS may indicate in broadcasted essential system information whether other system information is broadcasted or not. If not broadcasted then UE can request using the methods explained earlier. If broadcasted then UE read broadcasted system information to acquire the required system information. In case of heterogeneous network comprises of macro cell and small cells, macro cell may indicate that system information is broadcasted whereas small cells may indicate that system information is not broadcasted.
[0080] Alternately, minimum SI or essential SI may include a separate indication for each SI (e.g., SIB) or set of Sis (i.e., SIBs) wherein each indication indicates whether the associated SI or set of Sis are periodically broadcasted or are provided on demand. [0081] Alternately, minimum SI or essential SI may include a separate	Page 3 of 21, including: System information is categorized into two categories: First category comprises of one or more System information which is broadcasted periodically by the cell and/or TRP. Second category comprises of one or more system information which is provided to UE on demand. First category comprises of essential system information. Essential

Subject Matter from EX. 1008 Cited in Analysis Below	Supporting Corresponding Subject Matter in Agiwal Provisional (EX. 1009)
indication for each SI message wherein each SI message carries one or more Sis (i.e., SIBs). The indication associated with an SI message indicates whether Sis associated with that SI message are broadcasted or provided on demand. Mapping of SI message to SIBs is included in minimum SI or essential SI. In order to acquire a SI of second category, UE first determines whether that SI is periodically broadcasted or provided on demand. UE determines this based on indication included in first category (also referred as minimum SI or essential SI) of system information.	system information is periodically broadcasted by the cell and/or TRP. UE acquires essential system information from broadcasted information. In order to receive the other system information, UE sends random access preamble (PRACH). On receiving the random access preamble, BS transmits a random access response and includes UL grant for transmitting the system information (SI) request message. Page 4 of 21, including: In one embodiment of proposed invention system information (other than essential system information) can also be broadcasted by the BS. BS may indicate in broadcasted essential system information whether other system information is broadcasted or not. If not broadcasted then UE can request using the method (Figure 1) explained earlier. If broadcasted then UE read broadcasted system information to acquire the required system information. In case of heterogeneous network comprises of macro cell and small cells, macro cell may indicate that system information is broadcasted whereas small cells may indicate that system information is not broadcasted Page 15 of 21, including: In this method BS broadcasts the essential system information. BS also broadcasts the scheduling information about the other system information. However, other system information is not periodically broadcasted. BS broadcasts the other system information

Subject Matter from EX. 1008 Cited in Analysis Below	Supporting Corresponding Subject Matter in Agiwal Provisional (EX. 1009)
	for defined time duration on receiving a trigger (e.g. PRACH-SI) from the UE. The trigger can be specific to a system information or set of system information or service or UE type. During the time when the system information is broadcasted after receiving a trigger from UE, BS broadcasts an indication that it is broadcasting the system information. The indication can be specific to system information or a set of system information or service or UE type.
Paragraphs [0095]-[0101], Fig. 7	Fig. 7, Pages 8-9.
[0244] In an embodiment of the present disclosure within an SI area, different versions of associated SI can be used. Each of these versions is identified by an index or value tag. Let's say SI areas for SIB X are as shown in FIG. 16. Celll, Cell 2 and Cell 3 use a configuration of SIBx. Cell 1, Cell 2 and Cell 3 broadcasts that for SIBx, SI area ID is 1 and index/value tag is P. If cell 1, cell2 and cell 3 wants to use a different configuration for SIBx, then they broadcast that for SIBx, SI area ID is 1 and index/value tag is Q. Within the same SI area if there is change in index or value tag, and UE does not have a valid SI configuration corresponding to the new index/valuetag of that SI area, UE reacquires the corresponding SI. The SI configuration identified by index/valuetag is valid in SI area	Page 19 of 21, including: In alternate embodiment, system info area concept can be defined. System info areas refers to area covering one or more cells or transmits point or transmit/receive point wherein the system information used is same. System info area can be identified by a system inform area identifier. Cell or transmit point or transmit/receive point broadcasts the system info area identifier. Once a UE obtains the system info from a cell on demand, it requests for system info again after the cell (or transmit point or transmit/receive point) change only if the new cell (or transmit point or transmit/receive point) belongs to a different system info area. See also Fig. 16.

Subject Matter from EX. 1008 Cited in Analysis Below	Supporting Corresponding Subject Matter in Axiwal Provisional (EX. 1009)
in which it is obtained. It is not valid in another SI area. The scope of validity of index/valuetag is within the SI area. For example, the configuration of SIBx identified by index/value tag P in SI area ID 1 is not same as configuration of SIBx identified by index/value tag P in SI area ID2 or SI area ID 3. It is to be noted that in prior art the scope of valueTag is one cell. In this method of the present disclosure scope of value Tag is SI area i.e. multiple cells.	
[00256] System information is categorized into various parts/groups/sets. BS broadcasts System Information Set(s) supported. BS also broadcasts ValueTag/identifier/configuration index for each supported system information set/part/group. Change in value tag/identifier/configuration index corresponding to a system information set indicates that system information set/group/part is updated. Additionally BS may also broadcast change notification for each system information of a service. [0257] BS broadcasts Service(s) supported. BS also broadcasts valueTag/identifier/configuration index for each supported service. Change in value tag/identifier/configuration index	Page 21 of 21, including: System information is categorized into various parts/groups/sets. BS broadcasts System Information Set(s) supported. BS also broadcasts ValueTag/identifier/configuration index for each supported system information set/part/group. Change in value tag/identifier/ configuration index corresponding to a system information set indicates that system information set/group/part is updated. Additionally BS may also broadcast change notification for each system information of a service. BS broadcasts Service(s) supported. BS also broadcasts valueTag/identifier/ configuration index for each supported service. Change in value tag/identifier/ configuration index corresponding to service indicates that system information for that service is updated. Additionally BS may also broadcast

Subject Matter from EX. 1008 Cited in Analysis Below	Supporting Corresponding Subject Matter in Agiwal Provisional (EX. 1009)
corresponding to service indicates that system information for that service is updated. Additionally BS may also broadcast change notification for each system information of a service.	change notification for each system information of a service.
[0258] Change notification for each supported system information set or service is indicated in paging message. ValueTag/identifier/configuration index associated with updated system information can also be indicated in paging message.	Page 21 of 21, including: Change notification for each supported system information set or service is indicated in paging message
[0263] Alt: network (NW) may broadcast the updated information for defined time period. UE reads broadcasted information. [0264] In an embodiment, ValueTag/identifier/configuration index may indicate that system information set/group/part is changed. In another embodiment, ValueTag/identifier/configuration index may identify a particular configuration of system information set/group/part. When a network signals a system information set/group/part identifier and UE does not have configuration corresponding to this identifier then UE updates the system information. In one embodiment, each of this SI Set/part/group may contain same parameters but may be valid in	Page 21 of 21, including: Alt: NW may broadcast the updated information for defined time period. UE reads broadcasted information. In one embodiment, ValueTag/identifier/configuration index may indicate that system information set/group/part is changed. In another embodiment, ValueTag/identifier/configuration index may identify a particular configuration of system information set/group/part. When a network signals a system information set/group/part identifier and UE does not have configuration corresponding to this identifier then UE updates the system information. In one embodiment, each of this SI Set/part/ group may contain same parameters but may be valid in different area.

Subject Matter from EX. 1008 Cited in Analysis Below	Supporting Corresponding Subject Matter in Agiwal Provisional (EX. 1009)
different area.	
Figure 1.	Figure 1 (p. 3 of 21)
Figure 3.	Figure 3 (p. 5 of 21)
Figure 18.	Pages 19-20 of 21; Fig. 16.
Claim 1 [Pre]: A method for receiving system information (SI) by a user equipment (UE) in a wireless communication system, the method comprising:	“In one embodiment of the proposed invention the UE can acquire the system information as shown in Figure 1.” [Page 3].  Figure 1
[1a] receiving, from a base station (BS), first type SI associated with SI which is essential for communication with the BS;	“UE acquires essential system information from broadcasted information.” [Page 3]. See also Figure 1 above.
[1b] transmitting, to the BS, a physical random access channel (PRACH) preamble based on the first type SI;	“In order to receive the other system information. UE sends random access preamble (PRACH).” [Page 3]. See also Figure 1 above.
[1c] receiving, from the BS, a random access response (RAR) message; and	“On receiving the random access preamble, BS transmits a random access response [RAR] and includes UL grant for transmitting the system information (SI) request message. RAR may also include

Subject Matter from EX. 1008 Cited in Analysis Below	Supporting Corresponding Subject Matter in Agiwal Provisional (EX. 1009)
	timing advance and/or back off indicator and or preamble identifier (identifies the PRACH preamble). UE validates that RAR corresponds to PRACH transmitted by it.” [Page 3]. See also Figure 1 above.
[1d] receiving, from the BS, second type SI associated with at least one SI which the UE needs.	In response to SI request, ENB transmits SI-response wherein the SI-response includes the requested system information. [Page 3]. See also Figure 1 above.

XII. SUBSTITUTE CLAIMS 7-10 ARE UNPATENTABLE

A. Substitute Claims 7-10 Improperly Broaden the Original Claims

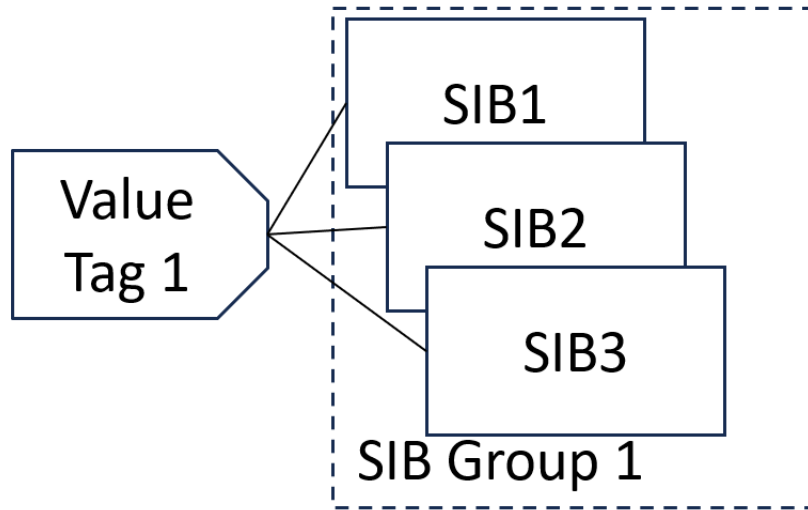
26. I have reviewed the Substitute Claims and the original claims for the '958 Patent, and I have concluded that there are at least some possible systems that would be covered by the Substitute Claims that would not be covered by the original claims. As a result, the Substitute Claims do not comply with the requirement that substitute claims not be broader than the original claims.

27. The original claims, and in particular limitations 1g of claim 1 and 3e of claim 3, required that “whether or not the second type SIB has changed is determined based on a value tag, associated with the group containing the second type SIB” This claim requires a determination be made as to whether a particular SIB has changed based on whether or not a single value tag has changed. In other words, there is a 1:1 relationship between the value tag and the second type SIB of

the claims. If the value tag has changed, the second type SIB has changed, and if the value tag has not changed, the second type SIB has not changed. A system without at least one second type SIB with one corresponding value tag that changes only when the second type SIB changes will not practice the claim.

28. In the Substitute Claims, there is no requirement that any value tag have such a 1:1 relationship with a second type SIB. As amended in the Substitute Claims, limitations 7g and 9e instead only require a value tag that corresponds to a group of SIBs. The change in the value tag need not be used to determine whether a particular second type SIB has changed. As a result, a system with no value tags with a 1:1 correspondence to any particular second type SIB may practice the Substitute Claim, even though it could not practice the original claim.

29. For example, a simple system like the one below could satisfy limitation 7g. In the system, a single value tag changes values by incrementing by 1 when any of SIB1, SIB2, or SIB3 are changed. This arrangement would satisfy the requirement of limitation 7g because a change in the value tag would indicate a change in SIB1, SIB2, or SIB3, and a lack of change in the value tag would indicate not change in SIB1, SIB2, or SIB3. This arrangement would not satisfy limitation 1g, as the value tag's change would not indicate that SIB1 had changed – the value tag could change whether SIB1 changed or not. Similarly, a change in the value tag would not indicate that SIB2 had changed or that SIB3 had changed.



30. Substitute Claims 7 and 9 therefore cover systems not covered by the original claims. The limitations added by Substitute Claims 8 and 10 dependent on Substitute Claims 7 and 9 do not add back the requirement that there be a 1:1 relationship between changes in a value tag and changes to a particular second type SIB. Accordingly, Claims 8 and 10 are broadening for the same reasons as claims 7 and 9.

B. Substitute Claims 7-10 are Indefinite

31. The amendments added in the Substitute Claims also render them indefinite. Substitute Claim limitations 7b and 9a both require a group of plural second type system information blocks fewer than the total number of second type information blocks. This limitation requires the existence of a second type information block outside of the claimed group, so whether a system information distribution scheme practices the claims depends on whether system information

blocks not in the group are classified as second type system information blocks. However, the claims do not limit what may be considered a second type information block. As a result, this classification of types of information blocks is purely subjective.

32. While there are examples of different types of system information in the '958 Patent, those types are non-limiting and potentially overlapping. For example, the patent refers to essential and non-essential system information as first and second type system information. Ex. 1001 at 8:34-55. The patent makes clear this is only one example embodiment and the claim recites first/second type rather than essential/non-essential. There are also other classifications of system information in the patent, such as broadcast and on-demand. As a result, a POSITA would not understand first/second type system information blocks to be limited to essential / non-essential system information.

33. Further, Substitute Claims 7 and 9 are comprising claims, meaning additional types of system information are allowed and not excluded by the claim. In other words, if the claim were satisfied by a classification of system information into two types, it could be avoided by classifying any second type system information blocks outside of the claimed group into a third or fourth type of system information blocks. Patent Owner's expert agrees that additional types of system information are permitted by the claims. Ex. 1011 at 49:2-6. These classifications

are arbitrary and subjective within the context of the claim, and as a result the claim fails to provide an objective boundary.

C. Substitute Claims 7-10 are Anticipated and/or Rendered Obvious by Lee, Alone or Combined with Agiwal

1. A POSITA Would Have Been Motivated to Combine Lee with Agiwal

34. A person of ordinary skill in the art would recognize the motivation to combine the teachings of Lee and Agiwal to achieve an improved system or method in wireless communication for the following reasons.

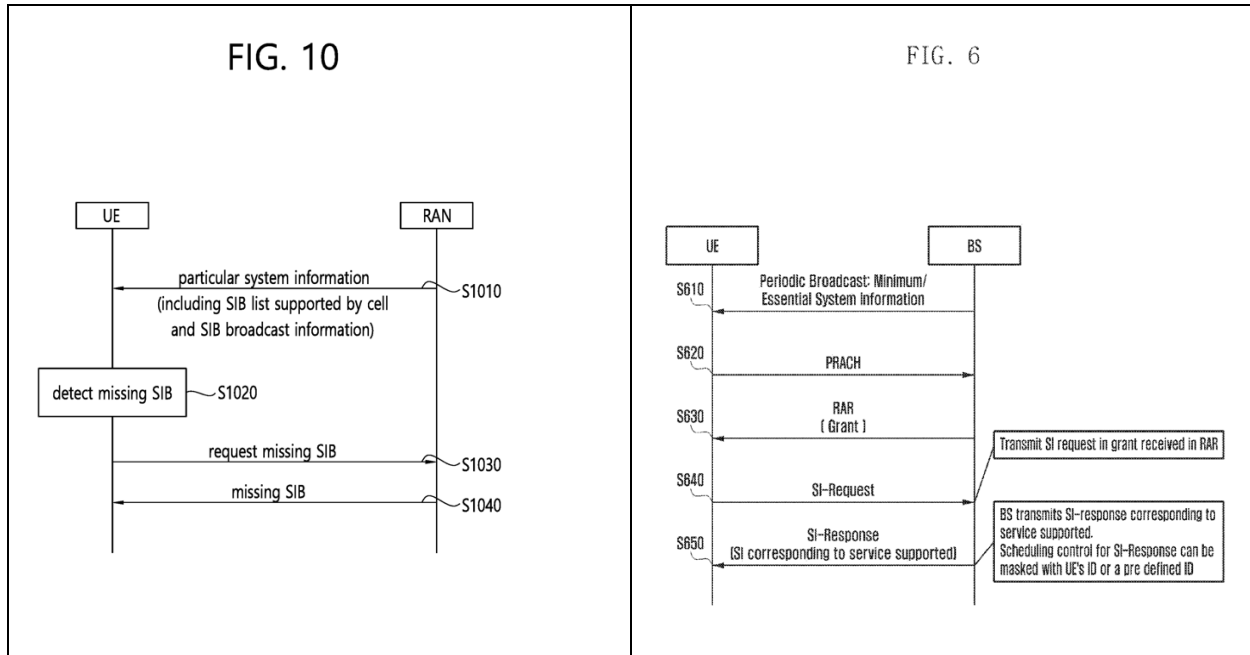
35. Both Lee and Agiwal address a wireless communication system. In particular they both address cellular communication systems. For example, Figure 1 of Lee and Figure 2 of Agiwal both show a cellular communication system. Lee states: “In order to meet the demand for wireless data traffic [soaring] since 4th generation (4G) communication system came to the market, there are ongoing efforts to develop enhanced 5th generation (5G) communication systems or pre-5G communication systems.” Ex. 1004 at [0003]. Agiwal states: “To meet the demand for wireless data traffic having increased since deployment of fourth generation (4G) communication systems, efforts have been made to develop an improved fifth generation (5G) or pre-5G communication system.” Ex. 1008 at [0003].

36. Both Lee and Agiwal address the issue of an increase in the amount of system information that a cell phone (user equipment or UE) requires. Lee states

“the number of system information blocks is continuously increasing, and radio resources are required to broadcast a system information block. Ex. 1004 at [0008]. Lee also states “Meanwhile, the number of system information blocks is continuously increasing, and radio resources are required to broadcast a system information block.” Ex. 1004 at [0101]. Agiwal states “One of the issues in current method of transmitting system information using the master information block (MIB)/system information blocks (SIBs) is that MIB/SIBs are periodically broadcasted irrespective of whether a user equipment (UE) is there in cell or not; whether any UE in cell needs that information. In case of small cell deployment, broadcasting all these SIBs periodically is unnecessary and leads to significant wastage of resources and increased energy consumption.” Ex. 1008 at [0013].

37. Both Lee and Agiwal discuss protocols for transmitting system information from the base station/access node to the UE. See, for example, Figure 10 of Lee and Figure 6 of Agiwal, reproduced below.

Disclosure in Lee	Disclosure in Agiwal
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38. Both Lee and Agiwal consider the base station transmitting value tags so the UE can determine if information in an SIB has been changed or not or is missing in the UE. For example, Lee states “The method may further include receiving, from the RAN, a value tag indicating system information to be requested from the RAN, wherein when the missing SIB is system information indicated by the value tag, the missing SIB may be requested from the RAN.” Ex. 1004 at [0013]. Lee also teaches organizing and grouping system information blocks by service type (e.g., MBMS, D2D, V2X, or WLAN). Ex. 1004 at [0118], [0175]-[0178]. Lee teaches the application of different value tags corresponding the service type for each SIB, so that the update of the tag for a service indicates that the SIBs for that service have changed. Ex. 1004 at [0168].

39. Agiwal also teaches an SI distribution system with both essential and non-essential SIBs transmitted by some combination of on-demand and broadcast transmissions. Ex. 1008 at [0066]-[0068]. Agiwal also teaches grouping SIBs into sets, groups, or parts. Ex. 1008 at Fig. 3, [0067]. Agiwal teaches the use of a value tag, identifier, or configuration index to signal to indicate a change in a group of SIBs. Ex. 1008 at [0256]. Like Lee, Agiwal also teaches using value tags associated with services. Ex. 1008 at [0257]. Agiwal also proposes placing a SIB in more than one SIB group, which would allow overlapping system information for two or more services to be in a common SIB. Ex. 1008 at [0068]. Like in Lee, Agiwal teaches using minimum or essential SI to identify which SIBs are on-demand or broadcast, as well as identifiers for the SIBs, the groups of SIBs, and associated value tags. Ex. 1008 at [0080]-[0081]. Agiwal's teaching of overlapping SIB groups each with their own value tags would potentially allow fewer overall value tags, depending on how system information is distributed in SIB groups. Agiwal also teaches system information groups to be shared across network nodes, allowing UEs to avoid requesting on-demand system information when moving between cells. Ex. 1008 at Fig. 18, [0244].

40. By combining the teachings of Lee and Agiwal, a POSITA could create a more flexible and efficient system information system than from Lee alone. For example, applying value tags to SIB groups with some overlapping SIBs as taught

by Agiwal would allow fewer value tags to be used compared to using value tags for each SIB individually. A POSITA would also be motivated to apply Agiwal's teaching of value tags for SIB groups shared across cells, as it would avoid redundancy in requiring updates of on-demand system information after a UE changes cells, without forcing system information used for more than one service to be carried in more than one SIB. Accordingly, a POSITA would have been motivated to combine Lee and Agiwal to improve the efficiency and flexibility of the system information in a 5G network. A POSITA would have had a reasonable expectation of success in combining the teachings of Lee and Agiwal, as they are similar, analogous references relating to the same problem (system information distribution in a 5G network) and proposing similar solutions to that problem. Integrating Agiwal's more flexible SIB grouping scheme into Lee would have been well within the skill of a POSITA to implement.

2. Original Claims

41. The original claims, and so the unamended language of the substitute claims, are anticipated by or obvious over Lee for the same reasons I provided in my first declaration from this proceeding, which I incorporate by reference. Ex-1002 ¶¶ 89-143. As Lee anticipates these limitations and/or renders them obvious, the combination of Lee with Agiwal would likewise render these original limitations obvious.

3. Substitute Claim 7

a. Modified Claim element 7b

7b	to generate a first type system information block (SIB) comprising information and a value tag <u>associated with a group of plural second type system information blocks fewer than the total number of second type information blocks, wherein each of the second type information blocks in the group has different sibIDs and the group has a group identifier</u> , 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 <u>belonging to the group</u> , the first type SIB being required for the wireless terminal to perform an initial access to the radio access network;
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42. Lee discloses claim element 7b.

43. Lee discloses system information blocks organized into SIBs each with an identifier, or sibID. Ex. 1004 at [0071]. Each SIB is numbered (e.g., SIB1 to SIBn) and a POSITA would understand that number to be a sibID within the meaning of the substitute claims.

44. Lee also discloses grouping system information according to different services a base station may offer, such as MBMS, D2D, V2X, and WLAN. Ex. 1004 at [0118]. Lee discloses “[a] system information block (SIB) is generated by the base station that contains a value tag. The value tag is associated with a type of system information block. This indication may include a value tag for a particular type of system information or a common value tag for all system information.” *Id* at [0168]. Lee uses “type” in multiple ways. One way is whether the SI is essential or not.

Here it is used in a different way because the only information being referred to is non-essential information. So, the type as used in this sentence is not distinguishing between essential or non-essential but different types of non-essential information. In other words, the SIBs required for MBMS may have one value tag, the SIBs required for D2D another value tag, the SIBs required for V2X another value tag, and so on.

45. For example, Lee teaches that the UE may receive from the network the “number of a type of an SIB to be requested” and then requesting the SIB that matches the number of the type. *Id* at [0017]. This discloses that the UE receives and requests the number of the type of SIB rather than the number of the SIB. This would indicate that the type of SIB could include multiple SIBs of the same type. As another example, Lee teaches that the SIBs for some kinds of supported services, such as MBMS, D2D, V2X, or WLAN interworking/integration, may not be broadcast in a cell and may instead be available on-demand. Ex. 1004 at [0118], [0123]-[0124]. Lee teaches that a common value tag can be used for a type of system information, and that a UE can determine whether the system information it needs has changed in reference to that value tag. Ex. 1004 at [0168]-[0169]. Lee further teaches that a UE can request missing system information by requesting the SIB (e.g., by a SIB identifier, or a sibID) or by identifying the service associated with the missing SIB (which would identify the SIBs in the group providing necessary system

information for that service – a group identifier). Ex. 1004 at [0172]-[0182], Fig. 14). A POSITA would therefore understand that the service associated with the system information in a group of SIBs would be a group identifier. Further, it would be obvious to a person of ordinary skill in the art to use a group identifier associated with a service to readily identify the set of SIBs necessary for that service.

46. Agiwal also discloses claim element 7b. In Agiwal the base station (BS) “broadcasts ValueTag/identifier/configuration index for each supported system information set/part/group. Change in value tag/identifier/configuration index corresponding to a system information set indicates that system information set/group/part is updated. Additionally, BS may also broadcast change notification for each system information of a service.” Ex. 1008 at [0256]; see also Ex. 1008 at Fig. 3, [0066]-[0068]. It is clear in Agiwal that the set of SIBs that the base station broadcasts a value tag for can be less than the total number of SIBs. Otherwise Agiwal would have stated that the value tag is for all SIBs, not a just a group of SIBs. It is also clear that at least some of the groups can include more than 1 second type SIB, otherwise grouping SIBs would be pointless. Agiwal further teaches that information about the organization and distribution of second-type of SIBs is transmitted in essential SI (that is, a first-type SIB). Ex. 1008 at [0080]-[0081].

47. Agiwal also discloses grouping system information into different groups or sets based on associated service type (e.g., MBB, URLL, MTC, D2D,

D2D-Discovery, D1D-Communication, V2X, V2V) or UE type (e.g., MTC UE, MBB UE, D2D UE, etc.). Ex. 1008 at [0071], [0098]. Agiwal also discloses that a “bit corresponding to system information set can be set to one to indicated that the UE needs that system information set. Id at [0071].

48. Lee combined with Agiwal would combine the above elements and include the second-type SIB information including identification of groups of SIBs from Agiwal in Lee’s first-type SIB.

b. Modified Claim element 7c

7c	upon a change of a second type SIB <u>belonging to the group</u> whose associated information indicated before the change that <u>the group containing</u> the second type SIB was provided on-demand, to include in the first type SIB the information associated with <u>the group containing</u> the second type SIB indicating that <u>the group containing</u> the second type SIB is provided by broadcast;
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49. 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.” Ex. 1004 at [0167].

50. Further, Agiwal teaches that when groups or sets of SIBs are updated by a base station, the base station can notify any interested UEs of those updates through the use of a single value tag for the group or set of SIBs. Ex. 1008 at [0256],

[0258], [0264]. The UE could then determine, from a change in the relevant value tag, that at least one SIB in the group or set of SIBs had changed, and could obtain updated system information if needed. *Id.* Agiwal also teaches that, following a change in system information, all changed system information could be broadcast (Ex. 1008 at [0263]) or that system information requested above a certain threshold could be switched to broadcast (Ex. 1008 at [0079]). In the former case, entire groups would be switched from on-demand to broadcast at least when all SIBs in the group are changed. In the latter case, SIB groups for services in use by more than a threshold number of users would be changed from on-demand to broadcast following a change in the SIB group's value tag.

c. Modified Claim element 7g

7g	whether or not <u>the group containing</u> the second type SIB has changed is determined based on a value tag, associated with <u>the group containing</u> the second type SIB, stored in the wireless terminal, and the value tag included in the first type SIB corresponding to <u>the group containing</u> the second type SIB.
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51. Lee teaches that the UE may check whether the second type SIB is changed based on the value tag. EX. 1004 at [0169]. Lee further teaches that the value tag could be applied for a particular type of system information, such as the system information for a particular service. Ex. 1004 at [0168], [0177]-[0180]. Lee also teaches that a bit transmitted from the access network can indicate to the UE a type of an SIB that can be requested. *Id.* at [0017].

52. Agiwal also teaches claim element 7g. “System information can be changed and is notified as follows: Change is notified through paging message (in RRC_IDLE or RRC_CONNECTED) with cause systemInfoModification to let UE know that some SI is changing in the next modification period. Modification period boundaries are in terms of SFN such that $\text{SFN mod modificationPeriod}=0$. Change of SI occurs at specific radio frames. Notification of changes in modification period N will be reflected in N+1. SIB1 also carries value tag to indicate change in SI. UE finds the change in SI by looking at value tag in SIB1 at the end modificationPeriod (if missed checking page) or receiving paging with systeminfoModification.” Ex. 1008 at [0011]. Further, Agiwal teaches that when groups or sets of SIBs are updated by a base station, the base station can notify any interested UEs of those updates through the use of a single value tag for the group or set of SIBs. Ex. 1008 at [0256], [0258], [0264]. The UE could then determine, from a change in the relevant value tag, that at least one SIB in the group or set of SIBs had changed, and could obtain updated system information if needed. *Id.*

4. Substitute Claim 8

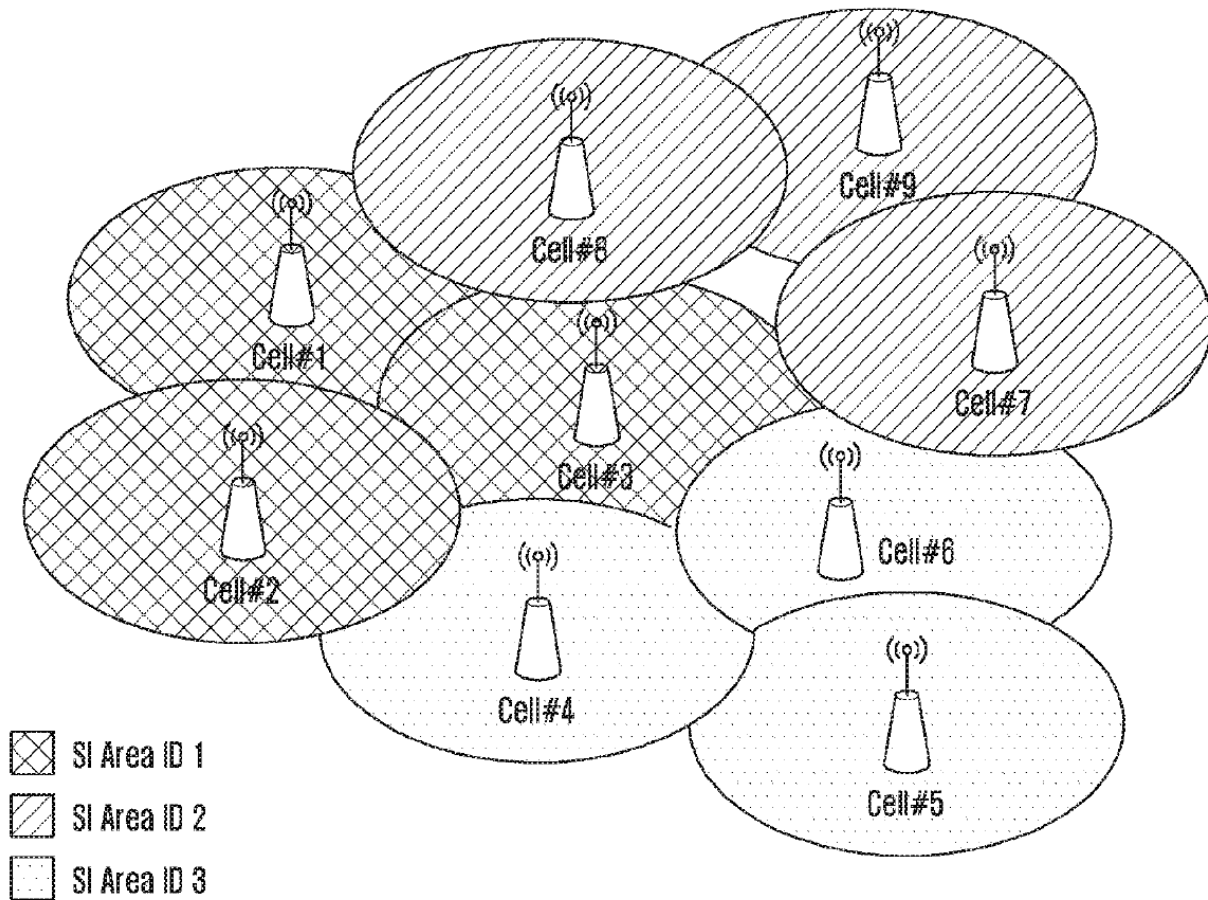
8	8. (proposed substitute for claim 2) The access node of claim [[1]]7 , wherein the transmitter circuitry is further configured to transmit the group identifier and the group containing the second type SIB by broadcast after the change.
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53. For the same reason the combination of Lee and Agiwal discloses claim 7, Lee and Agiwal disclose claim 8. For example, Lee teaches organizing SIBs into

groups based on the associated service. Ex. 1004 at [0175]-[0178]. The groups of SIBs would also have value tags transmitted by a separate first-type SIB, as discussed above. Ex. 1004 at [0118], [0168]. Lee also teaches that following a change, all SIBs would be transmitted. Ex. 1004 at [0167.] Each group of SIBs would therefore have an identifier, that would be transmitted identifying the group, along with group, following a change in the SIBs in the group.

54. A person of ordinary skill in the art would know that the value tag indicating a change would also include an identifier to know which group/type of SIB that has changed. Agiwal discloses in reference to Figure 18, reproduced below, an identifier associated with SIBs.

FIG. 18



55. Agiwal states “within an SI area, different versions of associated SI can be used. Each of these versions is identified by an index or value tag. Let's say SI areas for SIB X are as shown in FIG. [18]. Cell1, Cell 2 and Cell 3 use a configuration of SIBx. Cell 1, Cell 2 and Cell 3 broadcasts that for SIBx, SI area ID is 1 and index/value tag is P. If cell 1, cell2 and cell 3 wants to use a different configuration for SIBx, then they broadcast that for SIBx, SI area ID is 1 and index/value tag is Q. Within the same SI area if there is change in index or value tag,

and UE does not have a valid SI configuration corresponding to the new index/valuetag of that SI area, UE reacquires the corresponding SI. The SI configuration identified by index/valuetag is valid in SI area in which it is obtained. It is not valid in another SI area. The scope of validity of index/valuetag is within the SI area. For example, the configuration of SIBx identified by index/value tag P in SI area ID 1 is not same as configuration of SIBx identified by index/value tag P in SI area ID2 or SI area ID 3. It is to be noted that in prior art the scope of valueTag is one cell. In this method of the present disclosure scope of valueTag is SI area i.e. multiple cells.” Ex. 1008 at [0244].

56. Agiwal also discloses grouping system information into different groups or sets based on associated service type (e.g., MBB, URLL, MTC, D2D, D2D-Discovery, D1D-Communication, V2X, V2V) or UE type (e.g., MTC UE, MBB UE, D2D UE, etc.). Ex. 1008 at [0071], [0098]. Further, Agiwal teaches that when groups or sets of SIBs are updated by a base station, the base station can notify any interested UEs of those updates through the use of a single value tag for the group or set of SIBs. Ex. 1008 at [0256], [0258], [0264]. The UE could then determine, from a change in the relevant value tag, that at least one SIB in the group or set of SIBs had changed, and could obtain updated system information if needed. *Id.* Agiwal further teaches that information about which SI is on-demand or broadcast and when non-minimum/essential SI is to be broadcast is provided through

essential SI. See, e.g., Ex. 1008 at [0095]-[0097]. The UE can then wait for the group including the needed non-essential SI to be broadcast, or can request transmission. Ex. 1008 at [0099]-[0101]. Thus, Agiwal teaches both transmitting the group ID and the SIBs making up the group, as required by Substitute Claim 8.

57. Thus, Lee and Agiwal disclose modified claim 8.

5. Substitute Claim 9

58. Substitute Claim 9 includes the same modifications to the language of original claim 3 as are present in Substitute Claim 7. The original language of Substitute Claim 9 from original claim 3 are invalid over Lee for the reasons provided in my first declaration in this proceeding. The language added in Substitute Claim 9 is invalid over Lee or Lee in combination with Agiwal for the same reasons provided for Substitute Claim 7 above.

6. Substitute Claim 10

59. Substitute Claim 10 includes the same modifications to the language of original claim 4 as are present in Substitute Claim 8. The original language of Substitute Claim 10 from original claim 4 are invalid over Lee for the reasons provided in my first declaration in this proceeding. The language added in Substitute Claim 10 is invalid over Lee or Lee in combination with Agiwal for the same reasons provided for Substitute Claim 8 above.

XIII. CONCLUSION

60. The Substitute Claims simply recite concepts known in the art at the time. Thus, the Substitute 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 Substitute Claims of the '958 Patent are unpatentable.

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

Date: December 31, 2024

Executed: Wayne E. Stark