

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.

Petitioner,

v.

INTELLECTUAL VENTURES II LLC,

Patent Owner.

Case No. IPR2025-00220
U.S. Patent No. 11,206,670

PATENT OWNER'S PRELIMINARY RESPONSE

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PATENT OWNER’S EXHIBIT LIST

Ex. 2001	Petitioner’s Answer to Complaint and Counterclaim, dated June 20, 2024, in <i>Intellectual Ventures II LLC v. Tesla, Inc.</i> , C.A. 1:24-cv-00884-ADA (W.D. Tex.)
Ex. 2002	Docket from District Court Litigation, <i>Intellectual Ventures II LLC v. Tesla, Inc.</i> , C.A. 1:24-cv-00884-ADA (W.D. Tex.)
Ex. 2003	Scheduling Order from District Court Litigation, <i>Intellectual Ventures II LLC v. Tesla, Inc.</i> , C.A. 1:24-cv-00884-ADA (W.D. Tex.)
Ex. 2004	Defendant’s Second Supplemental Preliminary Invalidity Contentions, dated January 9, 2025, in District Court Litigation, <i>Intellectual Ventures II LLC v. Tesla, Inc.</i> , C.A. 1:24-cv-00884-ADA (W.D. Tex.)
Ex. 2005	File History of U.S. Patent Appl. 14/372,363
Ex. 2006	Declaration of Todor V. Cooklev, Ph.D.
Ex. 2007	Curriculum Vitae of Todor V. Cooklev, Ph.D.
Ex. 2008	<i>Modern Communications Systems: A First Course</i> Cooklev et al. (Michigan Publishing 2024)
Ex. 2009	<i>LTE – The UMTS Long Term Evolution From Theory to Practice</i> (Second Edition) Sessia et al. (John Wiley & Sons Ltd. 2011)

I. INTRODUCTION

The Petition for *Inter Partes* Review of U.S. Patent No. 11,206,670 (“Petition,” Paper #2) challenges claims 1-18 (“Challenged Claims”) of U.S. Patent No. 11,206,670 (“’670 Patent,” Ex. 1001) under a single statutory ground. [See Petition, 16].

The Petitioner’s challenge to the ’670 Patent rests on a single asserted ground of obviousness over the combination of Wallen and Berggren. Yet despite extensive citations and repetition of conclusory statements, the Petition fails to establish that the cited art teaches or suggests key claim limitations.

Petitioner’s reading of Wallen is not only inconsistent with the actual disclosures of that reference, but also relies on selective quotations and omissions that obscure the absence of the claimed functionality.

Moreover, the Petitioner offers no plausible rationale for combining Wallen with Berggren to supply the missing claim elements. In fact, Berggren is not cited in connection with the relevant limitations ([1.4] and [1.6]) and cannot fill the gaps in Wallen’s disclosure. Nor does the expert declaration submitted with the Petition cure these deficiencies; it merely restates the Petition’s arguments in slightly modified form and fails to provide any independent technical analysis supporting the asserted combination.

In sum, the Petition fails to meet the threshold requirement of demonstrating that the challenged claims are more likely than not unpatentable. The cited art does not teach or suggest each and every element of the claims, and the Petition’s theory of obviousness is both legally and factually unsupported. Accordingly, institution of inter partes review should be denied.

II. THE ‘670 PATENT

The ’670 Patent presents a novel and practical solution to a real-world problem faced by low-complexity, low-power wireless devices—such as smart meters and other machine-type communication (MTC) devices—attempting to operate over third and fourth generation mobile networks. These networks, originally optimized for high-throughput devices like smartphones, often prove unnecessarily complex and resource-intensive for MTC devices that transmit only small amounts of data at infrequent intervals. The ’670 Patent solves this disconnect by enabling such devices to communicate over a defined “subordinate carrier” embedded within a broader host carrier, using minimal bandwidth and well-defined, accessible system information, while maintaining compatibility with legacy network infrastructure.

As described in the specification, and confirmed during prosecution, the claimed invention addresses a specific technical problem that arises when low-

capability devices are unable to receive essential system information transmitted over bandwidths exceeding their reception capabilities. To overcome this, the '670 Patent discloses mechanisms for signaling the presence of an MTC subordinate carrier. The invention further introduces a structured method for allocating subordinate carrier resources using a subset of predefined subframe patterns (e.g., MBSFN subframes), and provides flexible ways to scale those allocations according to network conditions and device needs.

Importantly, the Patent Office considered the same prior art now relied upon by Petitioner—including the Wallen reference—and still found the claimed invention to be novel and nonobvious. During prosecution, the applicant not only disclosed Wallen but directed the Examiner to Office Actions in the parent application that substantively addressed Wallen. The Examiner, after evaluating the arguments and prior art—including Wallen, Xu, Axmon, and Petrovic—allowed the claims based on clear distinctions, including the limitation that the indicated frequency and time resources “include control information for use by the UE to acquire a system information block 1.” That limitation was added by Examiner’s Amendment and was central to allowance. Petitioner now re-asserts Wallen without meaningfully addressing this material distinction—one already considered and resolved during prosecution.

A. Background

The '670 Patent is focused on problems related to devices and applications which, rather than taking advantage of the high data rates available in third and fourth generation networks, instead take advantage of the robust radio interface and increasing ubiquity of the coverage area. [See Ex. 1001, 1:54-59]. Examples include so-called machine type communication (MTC) applications, also known as machine-to-machine (M2M) communications, some of which are in some respects typified by semi-autonomous or autonomous wireless communication devices (i.e. MTC devices) communicating small amounts of data on a relatively infrequent basis. [See Ex. 1001, 1:59-65]. Examples include so-called smart meters which, for example, are located in a customer's home and periodically transmit data back to a central MTC server relating to the customer's consumption of a utility such as gas, water, electricity and so on. [See Ex. 1001, 1:65-2:2].

While it can be convenient for a terminal such as an MTC-type terminal to take advantage of the wide coverage area provided by a third or fourth generation mobile telecommunication network there are at present disadvantages. [See Ex. 1001, 2:3-6].

Unlike a conventional third or fourth generation mobile terminal such as a smartphone, a primary driver for MTC-type terminals will be a desire for such terminals to be relatively simple and inexpensive. [See Ex. 1001, 2:7-10]. The type

of functions typically performed by a MTC-type terminal (e.g. simple collection and reporting of relatively small amounts of data) do not require particularly complex processing to perform, for example, compared to a smartphone supporting video streaming. [See Ex. 1001, 2:7-15]. However, third and fourth generation mobile telecommunication networks typically employ advanced data modulation techniques and support wide bandwidth usage on the radio interface which can require more complex and expensive radio transceivers to implement. [See Ex. 1001, 2:15-19]. It is usually justified to include such complex transceivers in a smartphone as a smartphone will typically require a powerful processor to perform typical smartphone type functions. However, as indicated above, there is now a desire to use relatively inexpensive and less complex devices to communicate using LTE type networks. [See Ex. 1001, 2:19-25].

B. Detailed Description

The '670 Patent discusses embodiments which relate to two classes of device. [See Ex. 1001, 7:33]. A first class of device is configured to communicate via a host carrier, and a second class of device, which may include MTC devices, is configured to communicate via a subordinate carrier. [See Ex. 1001, 7:33-8:3].

The '670 Patent recognizes that a problem can arise if essential control signaling from the base station is transmitted outside of the frequency range which can be received by a low-capability device, such as the MTC devices. [See Ex. 1001,

12:54-57]. For example, the ‘670 Patent notes that further system information, carried in System Information Blocks (SIBs), and the associated control signaling may be transmitted at a frequency which cannot be received by the low-capability device. [See Ex. 1001, 12:62-65]. The ‘670 Patent notes that this would cause problems, potentially preventing the low-capability device from being able to camp on the network. [See Ex. 1001, 12:65-67].

The ‘670 Patent notes that not all host carriers will necessarily support a subordinate carrier. [See Ex. 1001, 12:67-13:1]. If a low-capability device attempts to camp-on to a network which does not support a subordinate carrier then the camp-on procedure will ultimately fail. [See Ex. 1001, 13:1-4]. This is a waste of time and power for the low-capability device. [See Ex. 1001, 13:4-5].

The ‘670 Patent recognizes that it would be desirable to signal the presence of an MTC subordinate carrier, within a larger bandwidth LTE carrier accessible to legacy devices (LTE Rel. 8/9/10 UEs), to an MTC device which has restricted reception bandwidth. [See Ex. 1001, 13:6-9].

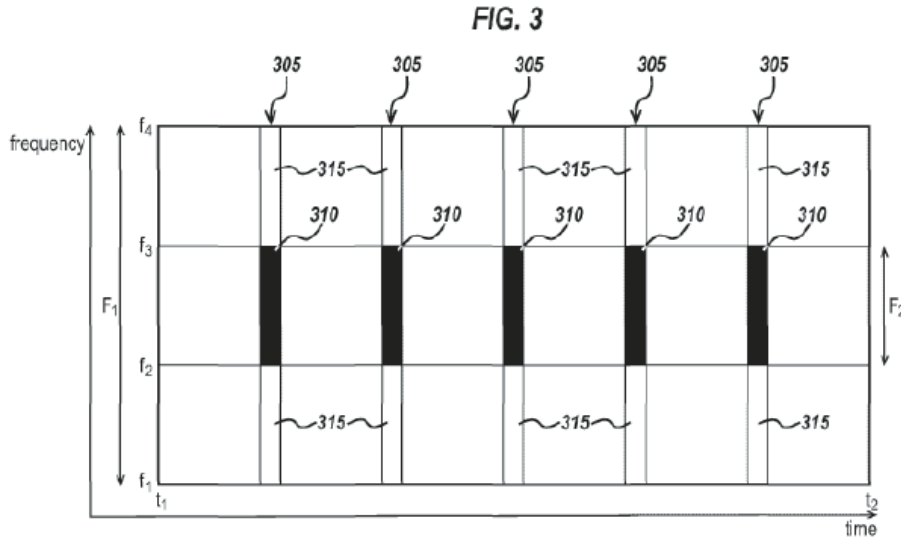
The ‘670 Patent notes that for all LTE bandwidths (Rel. 8/9/10) the basic physical layer synchronization signals and the most important system information (Master Information Block) is transmitted using only the central 6 resource blocks (72 subcarriers). [See Ex. 1001, 13:10-14].

The '670 Patent notes that the Master Information Block (MIB) is transmitted in the Physical Broadcast Channel (PBCH) which is allocated to the central 72 subcarriers and to just the first 4 OFDMA symbols of the second slot of every 10 ms radio frame. [See Ex. 1001, 13:14-18].

The '670 Patent notes that, assuming that the low bandwidth MT UE is able to receive at least 6 resource blocks in the frequency domain, then the PBCH (for example the MIB transmitted on PBCH) may be used to signal the presence of an MTC subordinate carrier. [See Ex. 1001, 13:18-22].

The '670 Patent describes an example embodiment which includes a method of conveying a subordinate carrier for low bandwidth devices within a portion of a larger host carrier. [See Ex. 1001, 18:1-3].

As described in relation to FIG. 3, the subordinate carrier resources (for use by MTC devices) may be defined by a certain bandwidth in the frequency domain (frequency band F2 in FIG. 3 for example) and a certain pattern of time periods in the time domain. [See Ex. 1001, 10:14-20]. In some implementations, the subordinate carrier may be delineated by scheduling a pattern of subframes. [See Ex. 1001, 10:25-28].



FIGS. 5A to 5D illustrate examples of such subframe patterns. Each of FIGS. 5A to 5D shows a portion of a repeating pattern which could be specified by mbsfn-SubframeConfigList or by a similar pattern specifying function. Four radio frames having ten subframes each are shown in FIGS. 5A to 5D. The subframes are labelled from 0 (zero) to 9 (nine). The shaded subframes are those allocated to the subordinate carrier, with the unshaded subframes being retained for use on the host carrier. [See Ex. 1001, 11:19-27].

FIG. 5A schematically illustrates an FDD pattern in which radioFrameAllocationPeriod is set to n2 (MBSFN subframes present in every other radio frame) ... FIG. 5B schematically illustrates a TDD pattern based on the same parameters as FIG. 5A. Specifically, radioFrameAllocationPeriod is set to n2 (MBSFN subframes present in every other radio frame) ... FIG. 5C schematically illustrates an FDD pattern in which radioFrameAllocationPeriod is set to n1

(MBSFN subframes present in every radio frame) ... FIG. 5D schematically illustrates a TDD pattern based on the same parameters as FIG. 5A. Specifically, radioFrameAllocationPeriod is set to n1 (MBSFN subframes present in every radio frame) ... A sub-set of the allocation patterns could be used to define the subordinate [carrier]. [See Ex. 1001, 11:27-29, 11:37-40, 11:47-50, 11:56-59, 12:2-3].

FIG. 5A



FIG. 5B

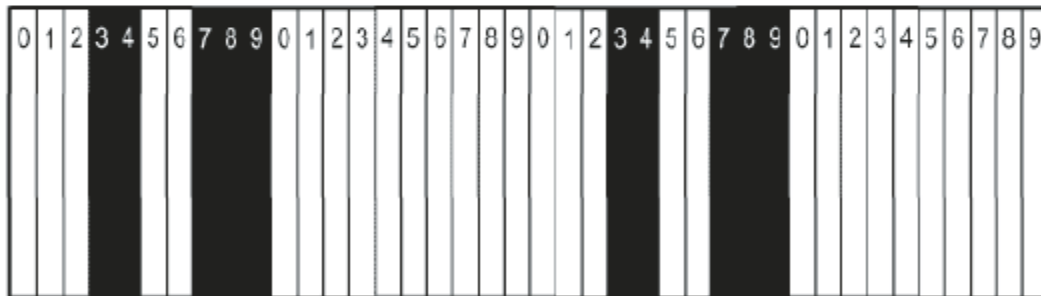


FIG. 5C

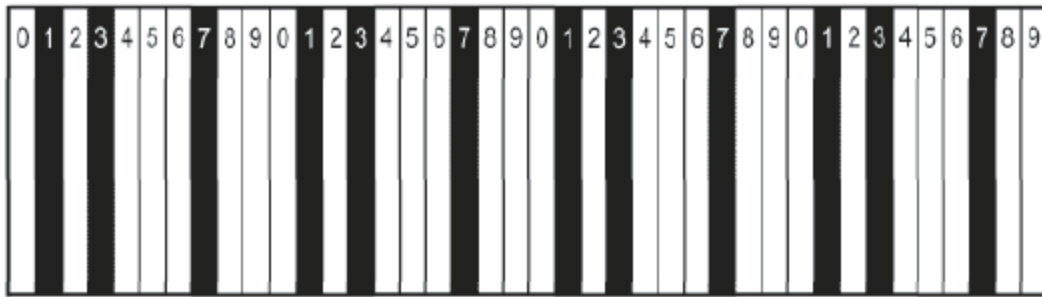
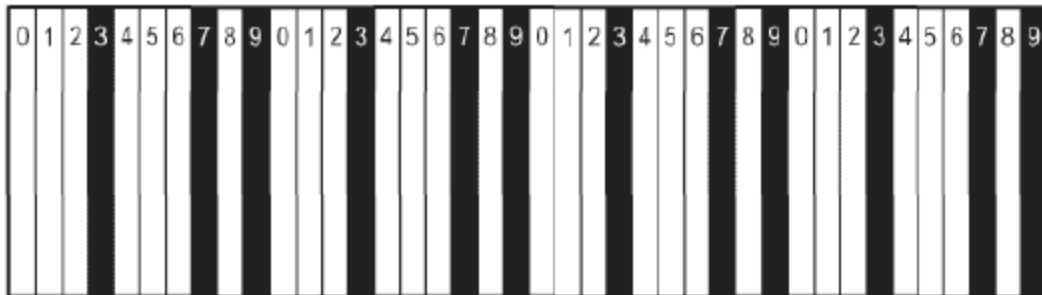


FIG. 5D



An increase in the amount of resources allocated to the subordinate carrier could be achieved either by altering the parameters of an existing subframe allocation as defined above, or by adding a new subframe allocation according to the principles set out above. A decrease in the amount of resources allocated to the subordinate carrier could be achieved either by altering the parameters of an existing subframe allocation as defined above, or by removing an existing subframe allocation. [See Ex. 1001, 12:27-35].

In other words, it is possible to use multiple subframe allocations to achieve allocation patterns which would not be possible with a single subframe allocation, and to provide a simple way of increasing (or decreasing, if one of multiple subframe

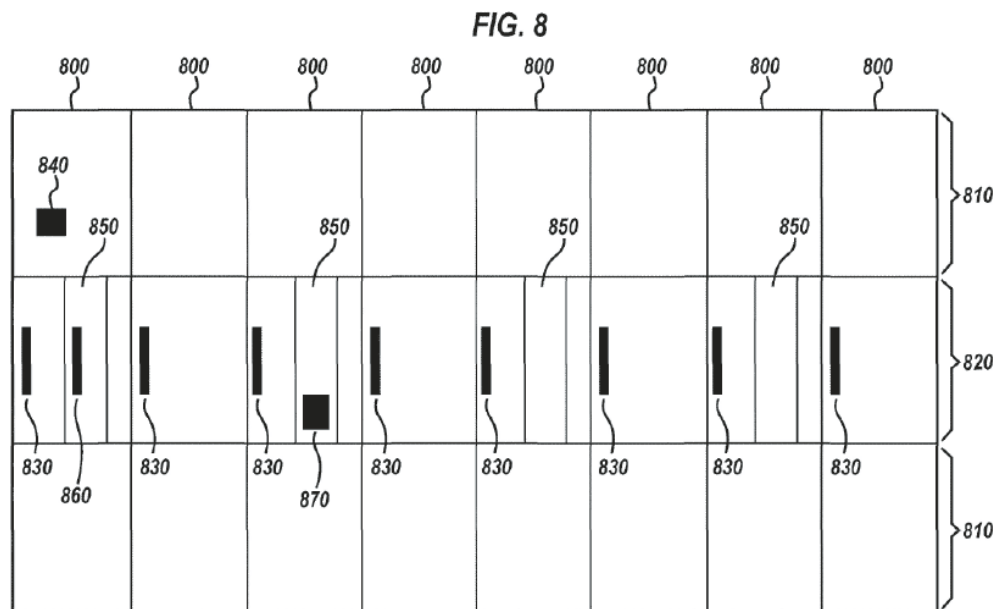
allocations is removed) the amount of resources allocated to the subordinate carrier. [See Ex. 1001, 12:36-41].

In signaling the presence of the subordinate carrier, certain resource blocks may be used to carry control signaling including synchronization signals and system information. As explained above, a problem can therefore arise if essential control signaling from the base station is transmitted outside of the frequency range which can be received by a low-capability device. Fortunately, as described above, the synchronization signals and the Master Information Block (MIB) of the system information are present within a frequency range which is likely to be receivable by a low-capability device. [See Ex. 1001, 12:51-57].

The '670 Patent describes methods of determining the downlink bandwidth of an MTC subordinate carrier by an MTC UE which involve signaling the downlink bandwidth in a Master Information Block of the subordinate carrier itself. A Master Information Block may be regarded as collection of parameters giving values to configurable characteristics of the carrier and other information to achieve/maintain radio frame synchronization. [See Ex. 1001, 14:37-47].

For example a single pattern comprising a single subframe allocation once per radio frame allocation period of 32 frames and with an offset value of zero may be considered adequate to convey the MIB dependent upon other details of the subordinate carrier design. [See Ex. 1001, 15:65-16:3].

In FIG. 8, example signaling on the host carrier and the subordinate carrier is schematically illustrated. [See Ex. 1001, 16:64-66].



In FIG. 8, eight radio frames 800 are shown, each having a central frequency portion 820 usable by both the host carrier and the subordinate carrier, and outer frequency portions 810 usable only by the host carrier. [See Ex. 1001, 16:66-17:3].

In each radio frame, a MIB 830 is provided in the central frequency portion 820. [See Ex. 1001, 17:3-4]. The MIB 830 is readable by devices using both the host carrier and the subordinate carrier. [See Ex. 1001, 17:4-6].

In an outer frequency portion 810, system information 840 is provided for use by devices served by the host carrier. [See Ex. 1001, 17:3-4]. The system information 840 is shown to be outside of the central frequency portion 820 and is thus not available to the kind of low-capability devices intending to use the subordinate

carrier. [See Ex. 1001, 17:3-4]. The system information 840 is provided in the form of System Information Blocks (SIBs). [See Ex. 1001, 17:3-4]. Generally, the Master Information Block 830 provides sufficient information to gain access to the first of the System Information Blocks (SIB1). [See Ex. 1001, 17:3-4].

C. Relevant Prosecution History of the '670 Patent

The '670 Patent is based on U.S. Patent App. No. 17/184,127 (the '127 Application), which was filed February 24, 2021 with a Track 1 request, and issued on December 21, 2021. [See Ex. 1002, pp. 1, 127, 187-189].

The '127 Application is a continuation of U.S. Pat. App. No. 16/190,420, filed on November 14, 2018, now US Pat. No. 10,939,446, which is a continuation of US Pat. App. No. 14/372,363 (the '363 Application), which was filed as PCT App. No. PCT/GB2013/050126 on Jan. 21, 2013. [See Ex. 1002, p. 119]. These applications claim priority of GB Pat. App. No. 1201000, Filed Jan. 20, 2012. [See Ex. 1002, p. 119].

Notably, as detailed in Patent Owner's Brief in Support of Motion for Discretionary Denial filed April 7, 2025, the '363 application cites and discusses Wallen in great detail, and discretionary denial is warranted, *inter alia*, on those grounds. [See Paper #6].

During the course of examination of the ‘127 application, the Examiner rejected the pending claims over several references, including Xu, Axmon, and Petrovic, in a single Office Action dated May 17, 2021. [See Ex. 1002, pp. 93-116].

Applicant filed a Response to the Office Action dated May 17, 2021, and filed an Information Disclosure Statement (IDS), on May 28, 2021. [See Ex. 1002, pp. 28-35, 56-74, 76-89]. In the IDS, Applicant directed the Examiner to numerous references, including the Wallen reference that was cited during prosecution of the parent ‘363 application, and specific Office Actions issued during prosecution of the parent ‘363 application which treated Wallen in detail. [See Ex. 1002, pp. 28-35, 76-89].

Following an Examiner interview on August 20, 2021, the Examiner signed the IDS on August 20, 2021 and a Notice of Allowance issued, which was dated September 22, 2021, and reflected an Examiner’s Amendment adding “...wherein the indicated frequency resources and the time resources include control information for use by the UE to acquire a system information block 1.” to the independent claims 1, 8, and 15. [See Ex. 1002, pp. 7-26, 28-35,].

In this context, having considered Wallen and specific Office Actions applying Wallen during examination of the ‘363 application, it is clear that the Examiner did not consider Wallen to disclose or teach “...wherein the indicated frequency resources and the time resources include control information for use by

the UE to acquire a system information block 1.” [See Ex. 1002, pp. 28-35 and Paper #6].

This treatment of Wallen during prosecution makes clear that the Office did not interpret Wallen as disclosing or teaching “...wherein the indicated frequency resources and the time resources include control information for use by the UE to acquire a system information block 1...” in the manner argued by Petitioner. [See Ex. 1002, pp. 15-20 and Paper #6].

III. CHALLENGED CLAIMS OF THE ‘670 PATENT

Independent claim 1 is representative of the Challenged Claims, and recites:

1. A user equipment (UE) comprising:

a transceiver; and

a processor, operatively coupled to the transceiver;

wherein the transceiver and the processor are configured to receive

a primary synchronization signal (PSS), a secondary synchronization signal (SSS), and a physical broadcast channel (PBCH) including a master information block (MIB), the PSS, SSS and PBCH are in a first bandwidth of a cell having a cell bandwidth, wherein the first bandwidth is a first portion of the cell bandwidth, wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information; and

the transceiver and the processor are configured to acquire the additional system information using the indication of the frequency resources and the time resources, wherein the indicated frequency resources and the time resources include control information for use by the UE to acquire a system information block 1.

Claim 1 captures the aspects of the control information that is emphasized above. [See Infra § II.B and Ex. 2006 ¶¶ 53-57]. For example, claim 1 expressly recites “...wherein the **MIB includes an indication of frequency resources and time resources** for use in acquiring additional system information ... **wherein the indicated frequency resources and time resources include control information** for use by the UE to acquire a system information block 1.” [See Ex. 1001, claim 1, and Ex. 2006 ¶¶ 53-57].

IV. REFERENCES AND EXPERT REPORT RELIED ON IN PETITION

The Petition advances a single ground, citing two alleged prior art references with the gaps in the reference being impermissibly filled by an expert report.

A. Wallen

U.S. Pat. Pub. No. 2012/0327895 to Wallén et al. (“Wallen”) was based on US Pat. App. No. 13/398,787 filed Feb. 16, 2012, and claims the benefit of US Prov. App. No. 61/501,547 (“Wallen-Prov”) filed Jun 27, 2011. [See Ex. 1005, cover]. Patent Owner does not acquiesce that the claimed priority date of Wallen-Prov

applies to the aspects of Wallen cited by Petitioner, and reserves the right to contest this claim.

Like the '670 Patent, Wallen relates to MTC devices which may not be able to receive information transmitted outside of a particular frequency range. [See Ex. 1005 ¶¶ [0014]-[0016], Ex. 2006 ¶¶ 59-61]

However, unlike the '670 Patent, where subordinate carrier resources for use by MTC devices may be defined by a certain bandwidth and pattern of time periods, for example, Wallen addresses the problem by operating on specific cells referred to as M-Cells, and by using a separate physical downlink control channel (PDCCH) for MTC devices, which Wallen refers to as M-PDCCH. [See Ex. 1005 ¶[0024], Ex. 2006 ¶¶ 59-61]. The M-PDCCH may be transmitted in a different symbol position from the host cell's PDCCH, or may be transmitted in a reserved subframe that would otherwise be occupied by the PDCCH. [See Ex. 1005 ¶ [0044], Fig. 3, Ex. 2006 ¶¶ 59-61].

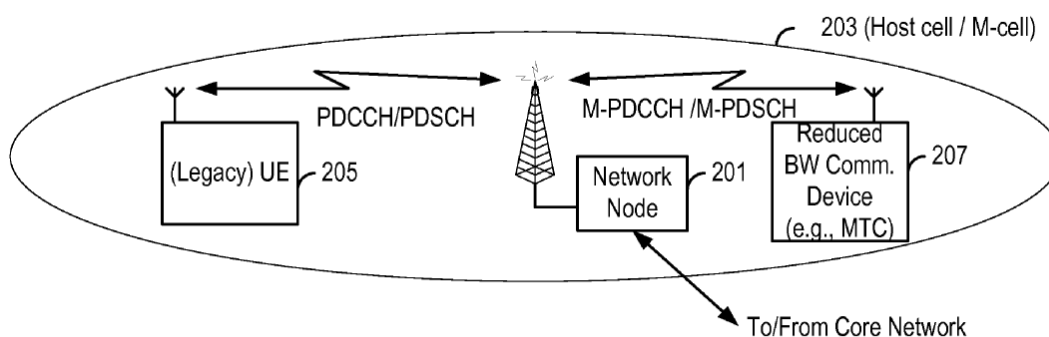


FIG. 2

Wallen can use spare bits in a MIB to indicate resources for connecting to the M-Cell. In particular, the MIB of Wallen can be used to identify resource blocks, reference signal sequence, or search space allocated to the M-PDCCH. [See Ex. 1005 [0072], Ex. 2006 ¶¶ 59-61]. The M-PDCCH, in turn, includes MTC-specific SIBs, or includes downlink assignments for SIBs intended for the MTC device. [See Ex. 1005 [0072], Fig. 3, Ex. 2006 ¶¶ 59-61].

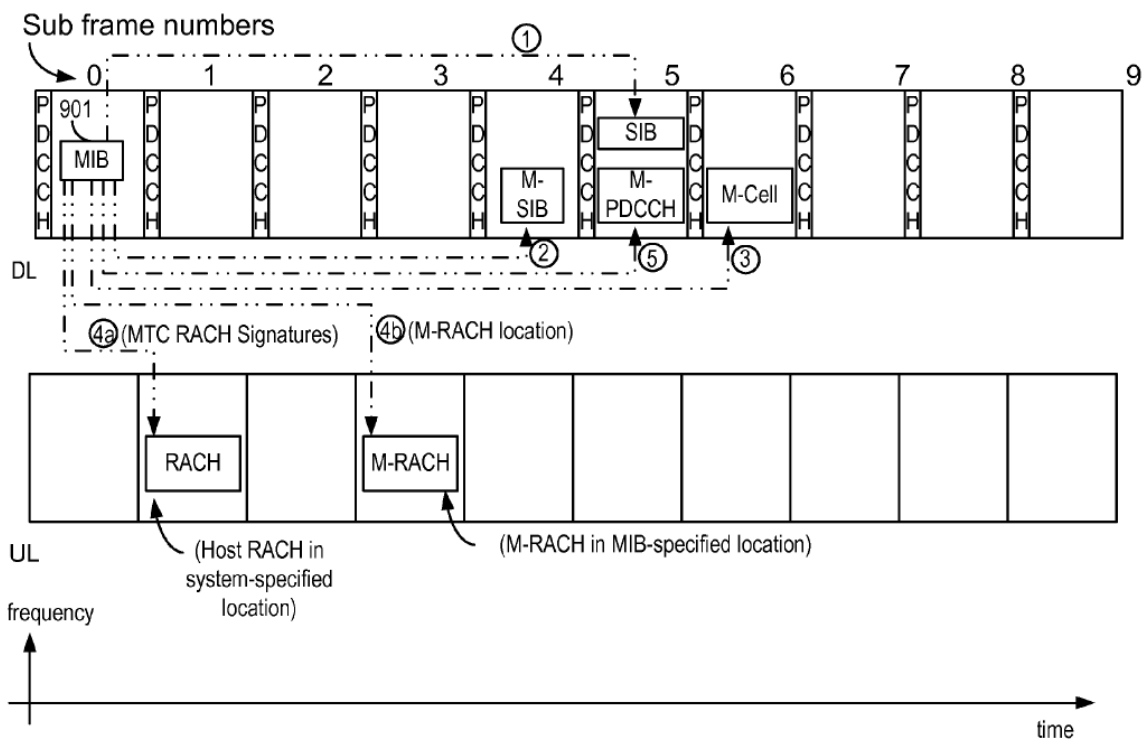


FIG. 9

It is noted that Wallen, at best, uses the spare bits in the MIB to directly indicate SIB resources (circled 1 in FIG. 9), directly indicate M-SIB resources (circled 2 in FIG. 9), to directly indicate the M-PDCCH resources which include the

M-SIB (circled 5 in FIG. 9), or to directly provide the SIB. [See Ex. 1005 ¶¶[0068]-[0072], Ex. 2006 ¶¶ 59-61].

However, neither the MIB nor M-PDCCH of Wallen indicates control information for use by the UE to acquire a system information block 1. [See Ex. 1005 ¶¶[0068]-[0072], Ex. 2006 ¶¶ 59-61, 65-76].

Thus, unlike the ‘670 Patent, neither the MIB of Wallen, nor the M-PDCCH of Wallen includes “...control information for use by the UE to acquire a system information block 1...” as in the independent claims of the ‘670 Patent. [See Ex. 1005 ¶¶[0068]-[0072], Ex. 2006 ¶¶ 59-61]. This is not surprising, because Wallen, unlike ‘670 Patent, is entirely unconcerned with delineating a subordinate carrier for use by MTC devices by scheduling a pattern of subframes – at best, Wallen simply indicates the specific resources of the SIB and/or M-PDCCH, and no control information is needed to acquire the SIB. [See Ex. 1005 ¶¶[0068]-[0072], Ex. 2006 ¶¶ 59-61].

B. Berggren

U.S. Pat. Pub. No. 2011/0269475 to Berggren et al. (“Berggren”) was based on US Pat. App. No. 13/175,529 filed July 1, 2011, which claims to be a continuation of PCT Application PCT/CN2010/070009, Filed January 4, 2010, and claims the benefit of Chinese Patent Application PCT/CN2009/070010 filed January 4, 2009. [See Ex. 1007, p. 1]. Patent Owner does not acquiesce that the claimed priority date

of either the Chinese application or PCT application applies to the aspects of Berggren cited by Petitioner, and reserves the right to contest this claim.

Berggren relates to synchronization signals in the context of an LTE system. [See Ex. 1007 ¶¶[0074], Ex. 2006 ¶¶[62-63]. Berggren does not relate to devices having narrower bandwidths than LTE devices, such as MTC devices, but rather, to devices having wider bandwidths than legacy LTE devices. [See Ex. 1007 ¶¶[0006], [0086], Ex. 2006 ¶¶[62-63]. Berggren does not relate to, nor was Berggren argued to, an indication of control information, such as a pattern of subframes, for use by a UE to acquire a system information block 1. [See Ex. 2006 ¶¶[62-63]. Berggren was cited in the Petition solely for the purpose of arguing that it would be obvious to carry the MIB of Wallen on a physical broadcast channel (PBCH). [See Paper #1 pp. 32-33, 36, 42-45, Ex. 2006 ¶¶[62-63].

C. Declaration of Zhi Ding, PH.D

The expert declaration submitted by Dr. Zhi Ding, Ph.D., (Ex. 1003) should be afforded little weight because it offers no meaningful analysis beyond what is already stated in the Petition. A significant portion of Dr. Ding's Declaration merely parrots the Petition nearly verbatim, with only cosmetic differences such as the inclusion of direct quotations in place of pinpoint citations. See, e.g., Ex. 1003, ¶¶[29-45, 50-143, 145]. The differences between the wording of these paragraphs, from the Declaration (which make up nearly the entire substantive portion) and the

corresponding paragraphs of the Petition are insubstantial. [Compare, e.g., Ex. 1003 ¶¶ 29-46, 52-55, 56-64, 65-143 and Petition pp. 7-15, 30-32, 33-38, 38-73]

For example, in many cases where the Petition provides a point citation to a given reference, the Declaration includes a quotation from the reference corresponding to the point citation. Such repetition does not constitute expert analysis and fails to provide the type of independent technical reasoning that might assist the Board. Consistent with *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 15-17 (PTAB Aug. 24, 2022) (precedential), expert declarations that do little more than restate a petitioner’s conclusory assertions—without additional technical rationale—are entitled to little or no weight.

This is especially true here, where the explanation is used not to explain the prior art, but to impermissibly fill gaps in the disclosure of Wallen. For instance, to support its flawed mapping of the claimed “...control information...” to Wallen’s resource blocks allocated to a specific M-PDCCH and/or directly to SIBs, the Petition asserts:

Wallen discloses or renders obvious limitation [1.6]. Ex.1003, ¶90.

As explained in the analysis of limitation [1.4], Wallen’s MIB indicates the frequency and time locations of “resource blocks” (*the indicated frequency resources and the time resources*) “allocated to a specific M-PDCCH” which, in turn, includes “control information” (*control information*) such as “downlink assignments pointing to the SIBs” (*for use by the UE to acquire a system information block*). Ex.1005, [0072] (“M-PDCCH supplies control information to the MTC device

including...**downlink assignments pointing to the SIBs that are intended for this MTC device.**"); Ex.1006, 9. Wallen's MIB that provides the location in frequency and time of the M-PDCCH is illustrated in Figure 9.

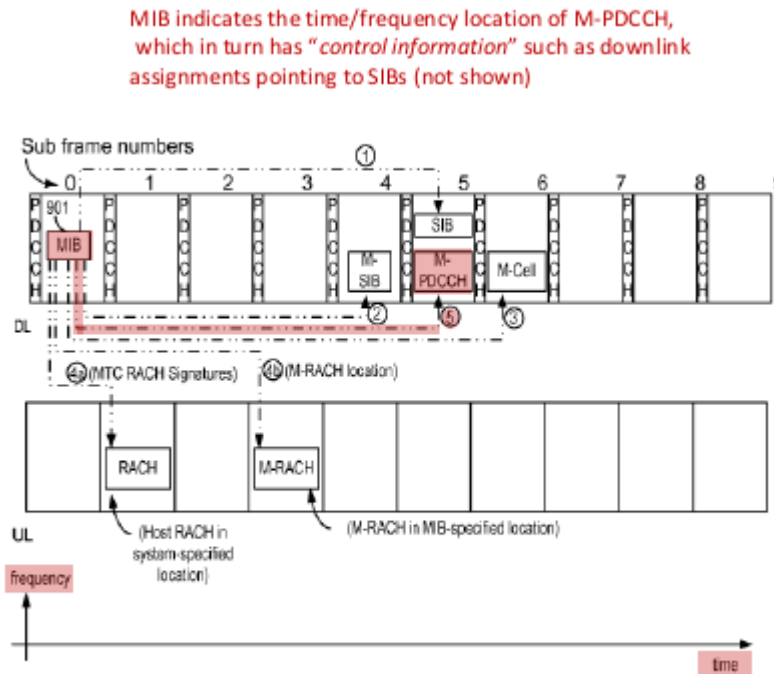


FIG. 9

Ex.1005, Figure 9 (annotated); Ex.1006, Figure 1; Ex.1003, ¶91

An example of one of Wallen's "SIBs" is SIB1, as disclosed in Wallen. Ex.1005, [0068] ("[T]he MIB 901 ... includes time/frequency information ... that informs the MTC device of a location of the resource blocks ... allocated to **the first system information block (SIB 1)**"); Ex.1006, 9. In fact, SIB1 is the only specific LTE SIB disclosed in Wallen. Ex.1003, ¶91. Moreover, it would have been obvious that one of Wallen's "SIBs" that are received includes the disclosed system information block 1 (SIB1) because SIB1 was known in LTE to carry information essential to connecting to a cell. Ex.1003, ¶91 (citing Ex.1009, pp. 2-3 (describing SIB1 as "essential" for connecting to a cell)). Therefore, the indication of SIB1 represents simply specifying an implementation detail of which of the known "SIBs" to indicate by Wallen's M-PDCCH, and it was obvious, predictable, and beneficial that one of the "SIBs" is a known and

essential SIB in LTE, namely, SIB1, the only specific SIB disclosed in Wallen. Ex.1003, ¶91.

In summary, Wallen discloses or renders obvious *the indicated frequency resources and the time resources* (Wallen’s MIB indicates the time/frequency location of resource blocks allocated to M-PDCCH) *include control information for use by the UE* (“M-PDCCH supplies **control information... intended for this MTC device**”) *to acquire a system information block 1* (the “control information” includes “downlink assignments pointing to the [system information blocks] **SIBs**,” such as Wallen’s “first system information block (SIB1)”), thereby disclosing or rendering obvious limitation [1.6]. Ex.1003, ¶91-92.

[Petition, pp. 50-53]. Nearly identically, Dr. Ding’s declaration asserts:

90. Wallen discloses or renders obvious limitation [1.6].

91. As explained in the analysis of limitation [1.4], Wallen’s MIB indicates the frequency and time locations of “resource blocks” (*the indicated frequency resources and the time resources*) “allocated to a specific M-PDCCH” which, in turn, includes “control information” (*control information*) such as “downlink assignments pointing to the SIBs that are intended for this MTC device [UE].” Wallen’s “*control information*” is thus “*for use by the UE [MTC device] to acquire a system information block [SIBs].*”

In another aspect (represented by the number ‘5’ enclosed in a circle), the **MIB 901 indicates the resource blocks**, reference signal sequence, or search space **allocated to a specific M-PDCCH**, which should occupy regions of the host system’s radiofrequency spectrum that are different from the host system’s own (legacy) PDCCH locations. **The M-PDCCH supplies control information to the MTC device, including MTC specific SIBs or downlink assignments pointing to the SIBs that are intended for this MTC device.**

essential SIB in LTE, namely, SIB1, the only specific SIB disclosed in Wallen.

92. In summary, the MIB indicates the time/frequency location of resource blocks allocated to M-PDCCH, which in turn provides time/frequency locations of SIBs, and it would have been obvious that the “SIBs” include Wallen’s SIB1 because SIB1 is a known LTE SIB that carries essential system information, thereby rendering obvious *the indicated frequency resources and the time resources* (indicated frequency and time locations of resource blocks for the M-PDCCH) *include control information* (include control information of downlink assignments pointing to SIBs, such as SIB1) *for use by the UE to acquire a system information block 1* (the first system information block, SIB1).

[Ex. 1003 ¶¶ 90-92]

Yet the declaration offers no technical arguments supporting this assertion. This omission is telling because the MIB of Wallen clearly does not include “...control information...” as in the independent claims (with claim 1 being representative). To the contrary, as identified by Dr. Cooklev, a PHOSITA would understand “...control information...” as in the instant claims, to include information such as pattern information, and not simply “...time- and/or frequency-wise locations of resource blocks...” as argued by Petitioner. [See Petition, p. 47, See also Supra, §, II. B, and Ex. 2006 ¶¶ 64-76].

As in *Facebook, Inc. v. Windy City Innovations, LLC*, 973 F.3d 1321, 1340-41 (Fed. Cir. 2020), where the Federal Circuit affirmed that expert testimony should be discounted when it merely repeats unpersuasive attorney argument without

substantiating analysis, the Board should accord little weight to Dr. Ding's conclusory statements.

Ultimately, Petitioner's expert is not interpreting Wallen but is, instead, re-writing it to conform to the claim limitations—precisely the kind of improper hindsight reconstruction prohibited under § 311(b). The declaration's failure to offer independent analysis, combined with its unsupported assertions that contradict the cited reference, confirms that it should be afforded little, if any, probative value.

V. THE PETITION FAILS TO DEMONSTRATE A REASONABLE LIKELIHOOD OF SUCCESS ON THE MERITS

The Petition presents a single ground of unpatentability, alleging that claims 1–18 of the '670 Patent are obvious over the combination of Wallen and Berggren. [See Petition, p. 16]. This sole ground is fundamentally deficient.

As detailed below, Petitioner's challenge relies on an internally inconsistent and unsupported interpretation of the '670 Patent's claim language, mischaracterizations of the teachings of the prior art, and conclusory assertions that fail to satisfy the evidentiary burden under 35 U.S.C. § 103. In particular, the Petition fails to establish that the combination of Wallen and Berggren teaches or suggests the claim limitation requiring that the *Master Information Block (MIB) includes an indication of frequency resources and time resources for use in acquiring additional system information ... wherein the indicated frequency resources and time resources*

include control information for use by the UE to acquire a system information block 1, as explicitly required by independent claim 1.

The Petition concedes that Wallen’s MIB does not include control information and instead argues that the control information resides in Wallen’s M-PDCCH. [See Petition, pp. 48–51]. Petitioner’s theory misreads the plain language of the claim and fails to tie the required functionality to the claimed structural location.

Moreover, Petitioner’s reliance on Wallen’s M-PDCCH to satisfy the claim’s control information requirement is misplaced. Even if the M-PDCCH includes downlink assignments to SIBs—as Petitioner asserts—there is no showing that those assignments constitute “control information for use by the UE to acquire a system information block 1,” as that term is used in the ’670 Patent and understood by a person of ordinary skill in the art. Petitioner further compounds this error by selectively quoting and omitting qualifying language from Wallen that undercuts its own position.

Finally, Petitioner fails to explain how Berggren remedies any of these critical deficiencies. Berggren is not cited in connection with the contested limitations ([1.4] and [1.6]) and offers no teaching of the required MIB structure or the specific control information claimed. At most, Petitioner asserts that Berggren supports carrying a MIB on a PBCH—but that assertion is irrelevant to the claim language at issue.

For these reasons, and as further explained below, Ground 1 of the Petition fails to present a prima facie case of obviousness, and the Petition should be denied.

A. The proposed combination of Wallen and Berggren does not teach each and every element of the claims

Ground 1 is deficient in that Wallen does not disclose or teach, alone or in combination with Berggren, “...wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information ... wherein the indicated frequency resources and time resources include control information for use by the UE to acquire a system information block 1.” as required by claim 1 (emphasis added). [See Ex. 2006, par. ¶¶ 64-76]. The Petition refers to these aspects of claim 1 as [1.4] and [1.6]. [See Petition, pp. 46, 50].

B. Wallen, alone or in combination with Berggren, does not teach “...wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information ... wherein the indicated frequency resources and time resources include control information for use by the UE to acquire a system information block 1.” as required by claim 1.

First, as set forth in further detail below, Petitioner effectively concedes that the MIB of Wallen does not include “...control information...” as set forth in claim 1, but instead argues that the cited M-PDCCH of Wallen includes “...control information...” as set forth in the independent claims.

Second, and separately, as set forth in further detail below, the cited M-PDCCH of Wallen does not include “...control information for use by the UE to acquire a system information block 1...” as set forth in the independent claims. At best, the cited M-PDCCH includes a SIB itself, or includes an indication of resources of the SIB where Petitioner has not explained how such indication of resources of the SIB is control information.

Third, and separately, as set forth in further detail below, embodiments of Wallen alleged by Petitioner to point directly to SIB1 do not disclose or teach “...control information...” as in the independent claims.

Fourth, and separately, as set forth in further detail below, the petition does not attempt to set forth a case that Berggren teaches or discloses teach “...control information...” or otherwise remedies these deficiencies in Wallen, and it is clear that Berggren does not teach or disclose this.

C. The MIB of Wallen does not include “...control information...” as in claim 1.

First, regarding claim element [1.4], Petitioner argues, essentially, that paragraph [0072] of Wallen discloses or teaches “...wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information...” [See Petition, p. 47, citing Ex.1005, [0072] ; Ex.1006, 9 and Ex. 1003, ¶84].

Petitioner further argues that “...Wallen describes the MIB generally as “conveying ... time- and/or frequency-wise locations of resource blocks,” and that “...Wallen’s indication of resource blocks, conveyed as time and frequency locations,

allocated to an M-PDCCH is an indication of frequency resources and time resources...” [See Petition, p. 47].

Petitioner further argues that “[t]hese resource blocks of the M-PDCCH include “control information” that includes “downlink assignments pointing to the SIBs.” [See Petition, p. 48]. Petitioner further argues that “[t]herefore, the indicated resource blocks (an indication of frequency resources and time resources) are used for acquiring additional system information in the form of SIBs (for use in acquiring additional system information).” [See Petition, p. 48].

By all of these arguments regarding the claim element referred to as [1.4], it is clear that Petitioner considers, and states conclusorily without explaining, that “...the resource blocks ... allocated to a specific M-PDCCH...” indicated by MIB 901 of Wallen to disclose or teach “...an indication of frequency resources and time resources for use in acquiring additional system information...” as in claim element [1.4]. [See Ex. 2006, 66-68].

However, regarding claim element [1.6], Petitioner further clarifies that:

“[a]s explained in the analysis of limitation [1.4], Wallen’s MIB indicates the frequency and time locations of “resource blocks” (the indicated frequency resources and the time resources) ‘allocated to a specific M-PDCCH’ **which, in turn,** includes ‘control information’ (control information) such as ‘downlink assignments pointing to the SIBs” (for use by the UE to acquire a system information block). Ex. 1005, [0072] (“M-PDCCH supplies control information to the MTC device

including ... downlink assignments pointing to the SIBs that are intended for this MTC device.’ [Petition, pp. 50-51 (emphasis added)].

Here it is notable that **Petitioner has omitted a portion of paragraph [0072]** in an attempt to imply that Wallen discloses that control information supplied by M-PDCCH includes downlink assignments pointing to the SIBs that are intended for the MTC device. The only support for this position is the elipsed, selected quote above. **Petitioner does not explain how the downlink assignments are control information as described in this cited paragraph [0072] of Wallen.** Accordingly, Petitioner has not made a case for obviousness in view of Wallen.

Further, consistent with Petitioner’s argument, Petitioner annotates FIG. 9 of Wallen with the legend “MIB indicates the time/frequency location of M-PDCCH, **which in turn** has “control information” such as downlink assignments pointing to SIBs (not shown).” [Petition, p. 51 (emphasis added)].

Petitioner further argues that “[a]n example of one of Wallen’s “SIBs” is SIB1, as disclosed in Wallen ... [i]n fact, SIB1 is the only specific SIB disclosed in Wallen ... [m]oreover, it would have been obvious that one of Wallen’s ‘SIBs’ that are received includes the disclosed system information block 1 (SIB) because SIB1 was known in LTE to carry information essential to connecting to a cell. [See Petition, pp. 51-52, citing Ex. 1005, [0068], Ex. 1006, 9, Ex. 1003, par. 91, and Ex. 1009, pp. 2-3].

Petitioner's arguments regarding claim element [1.6] are largely focused on attempting to establish that, while Wallen does not disclose "...system information block 1..." as in [1.6], it would have been obvious for the device described in Wallen to receive SIB1. [See Ex.1006, pp. 51-52]. However, even if this were assumed for the sake of argument (and Patent Owner does not concede this), it is clear that Petitioner unequivocally concedes that Wallen's MIB does not include the control information. [See e.g., Petition, p. 48 and See Ex. 2006, ¶ 68]. As indicated by the emphasized portions of Petitioner's argument cited above, at best, it is Wallen's M-PDCCH channel that includes downlink assignments pointing to SIBs, argued by Petitioner to correspond to "...control information..." as in claim 1 – not Wallen's MIB. [See Petition, p. 48, and See Ex. 2006, par. ¶¶ 68-71].

This is contrary to the express requirements of claim 1 "...wherein **the MIB includes an indication of frequency resources and time resources** for use in acquiring additional system information ... **wherein the indicated frequency resources and time resources include control information** for use by the UE to acquire a system information block 1." as required by claim 1. [See Ex.1006, ¶¶ 68-69].

In other words, even according to Petitioner's interpretation of "...control information..." as resources, claim 1 requires that the indication of resources in the MIB includes control information. In claim 1, the indication of resources in the MIB

includes control information - not resources of a channel that includes control information. [See Ex.1006, ¶¶ 69-73].

D. The M-PDCCH of Wallen does not include “...control information...” as in claim 1.

Second, as set forth above in § V.A.1.a.1, Petitioner argues, essentially, that paragraph [0072] of Wallen discloses or teaches “...wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information...” [See Petition, p. 47, citing Ex.1005, [0072]; Ex.1006, 9]. Based on this passage, Petitioner argues that “...the MIB ‘indicates the...resource blocks allocated to a specific M-PDCCH.’” [Petition, p. 47]. Petitioner further argues that “[t]hese resource blocks of the M-PDCCH include “control information” that includes “downlink assignments pointing to the SIBs.”” [See Petition, p. 48].

As indicated by the emphasized portions of Petitioner’s argument cited above, Petitioner argues that downlink assignments present in Wallen’s M-PDCCH channel correspond to “...control information...” as in claim 1. [See Ex. 2006, ¶¶ 69-73].

However, regarding claim element [1.6], Petitioner argues that:

“[a]s explained in the analysis of limitation [1.4], Wallen’s MIB indicates the frequency and time locations of “resource blocks” (the indicated frequency resources and the time resources) ‘allocated to a specific M-PDCCH’ **which, in turn,** includes ‘control information’ (control

information) such as ‘downlink assignments pointing to the SIBs” (for use by the UE to acquire a system information block). Ex. 1005, [0072] (“M-PDCCH supplies control information to the MTC device including ... downlink assignments pointing to the SIBs that are intended for this MTC device.’ [Petition, pp. 50-51 (emphasis added)]).

Again it is notable that **Petitioner has omitted a portion of paragraph [0072]** in an attempt to imply that Wallen discloses that control information supplied by M-PDCCH includes downlink assignments pointing to the SIBs that are intended for the MTC device. The only support for this position is the elipsed, selected quote above. **Petitioner does not explain how the downlink assignments are control information as described in this cited paragraph [0072] of Wallen.** Accordingly, Petitioner has not made a case for obviousness in view of Wallen.

Further, Petitioner’s argument is contrary to the requirements of claim 1 “...wherein the indicated frequency resources and time resources include control information for use by the UE to acquire a system information block 1.” as required by claim 1. [See Ex. 2006, ¶¶ 69-73].

Even if the M-PDCCH resources were considered as “...frequency resources and time resources...” for the sake of argument, Petitioner has not explained how the frequency resources and time resources include “...control information for use by the UE to acquire a system information block 1...” as required by claim 1. [See Ex. 2006, ¶¶ 72-73]. At best, the M-PDCCH of Wallen indicates the actual frequency and time

resources of SIB1, and not “...control information for use by the UE to acquire a system information block 1...” as in claim 1, which is differentiated from actual frequency resources and time resources of SIB1 by the language of the claim. [See Ex. 2006, ¶¶ 72-73].

E. Embodiments of Wallen alleged by Petitioner to point directly to SIB1 do not disclose or teach “...control information...” as in claim 1.

Third, in footnote 4 of Page 49 of the Petition, Petitioner incorrectly characterizes Ex.1013 p. 25 as taking a position that “...the MIB points directly to ... SIB1...”

4 According to Patent Owner’s apparent understanding of limitation [1.4] in the district court litigation, the MIB points directly to system information, such as an SIB1. Ex.1013, 25. Note that Wallen presents an embodiment that discloses or renders obvious limitation [1.4] under Patent Owner’s apparent understanding that an MIB that points directly to SIB1 satisfies limitation [1.4]. Ex.1005, [0068] (“the MIB 901...informs the MTC device of a location of the resource blocks ... allocated to the first system information block (SIB 1)”), Figure 9; Ex.1006, 9, Figure 1; Ex.1003, ¶86.

This argument is contrary to a plain reading of Ex.1013 p. 25, which highlights a schedulingInfoSib1-BR field of a MIB as indicating “...the index to the tables that define SystemInformationBlockType1-BR scheduling information...” [See Ex. 2006, ¶¶ 74-75].

It is clear from a plain reading of Ex.1013 p. 25 that the schedulingInfoSib1-BR field corresponds to “...**control information** for use by the UE to acquire a system information block 1.” as required by claim 1, and it is equally plain that the embodiment of Wallen where “(‘the MIB 901...informs the MTC device of a location of the resource blocks ... allocated to the first system information block (SIB 1)’) cited by petitioner and quoted above does not include “...control information for use by the UE to acquire a system information block 1” as required by claim 1. [See Ex. 2006, ¶¶. 74-75]. At best, in this embodiment, the MIB of Wallen indicates the actual frequency and time resources of SIB1, and not “...control information...” as in claim 1. [See Ex. 2006, ¶¶. 74-75]. It is clear that “...control information...” as in claim 1 includes information such as a schedulingInfoSib1-BR field of a MIB, and not simply “... time- and/or frequency-wise locations of resource blocks...” as argued by Petitioner. See Petition, p. 47, See also Supra, § II. B and [Ex. 2006, ¶¶. 72-73].

F. Berggren does not remedy the deficiencies in Wallen.

Fourth, Berggren is not cited in the petition regarding [1.4] or [1.6]. [See Petition, Sections X.C.2, X.C.4.[1.4], X.C.4.[1.6], and Ex. 2006, ¶¶ 62-63, 76]. As detailed in Patent Owner’s Brief in Support of Motion for Discretionary Denial filed April 7, 2025, Berggren was cited in the Petition solely for the purposes of arguing that it would be obvious to carry the MIB of Wallen on a physical broadcast channel

(PBCH). [See Paper #6 at Section III.B.2, Petition pp. 41-46, and Ex. 2006, ¶¶ 62-63, 76]. Accordingly, no combination of Berggren with Wallen has been established to remedy the deficiencies in Wallen discussed above. [See Ex. 2006, ¶¶ 62-63, 76]

G. The Petition Fails to Establish that Wallen or Berggren Discloses the Claimed MIB Structure Including Control Information for Acquiring SIB1, as Required by Independent Claim 1.

Petitioner has not shown, and indeed cannot show, that Wallen alone or in combination with Berggren teaches or suggests each and every limitation of the challenged claims. Most notably, Petitioner fails to demonstrate that either reference discloses the critical limitation requiring that the *Master Information Block (MIB) includes an indication of frequency resources and time resources for use in acquiring additional system information ... wherein the indicated frequency resources and time resources include control information for use by the UE to acquire a system information block 1*, as required by independent claim 1 and its dependents.

Rather than identifying teachings in the prior art that meet this limitation, Petitioner mischaracterizes disclosures in Wallen by selectively quoting and omitting material context. Even under Petitioner's strained reading, Wallen's MIB at best identifies the location of the M-PDCCH, which in turn may contain downlink assignments—not control information in the manner required by the claim. Petitioner's interpretation thus fails to meet the plain language of the claim.,

Nor does Berggren cure these deficiencies. Petitioner does not cite Berggren for the contested limitations ([1.4] and [1.6]), and Berggren discloses nothing about the required MIB structure or its use to deliver control information for acquiring SIB1. Petitioner's reliance on Berggren is thus both procedurally and substantively inadequate to support its obviousness theory.

Accordingly, the Petition fails to meet the threshold burden under 35 U.S.C. § 314(a), and the Board should deny institution of inter partes review.

VI. CONCLUSION

The Petition fails to meet the threshold burden of establishing a reasonable likelihood that any challenged claim of the '670 Patent is unpatentable. The Petitioner has not shown that either Wallen or Berggren—individually or in combination—teaches or suggests all limitations of the independent claims, particularly the critical limitation requiring that the *Master Information Block (MIB)* *includes an indication of frequency resources and time resources for use in acquiring additional system information ... wherein the indicated frequency resources and time resources include control information for use by the UE to acquire a system information block 1.*

Rather than identifying teachings in the cited references that satisfy this limitation, the Petitioner improperly attempts to shift the claimed functionality to

unrelated components, such as the M-PDCCH, and relies on mischaracterizations and selective citations that do not withstand scrutiny. The Patent Office already considered Wallen during prosecution—along with related references—and allowed the claims based on distinctions that the Petitioner fails to overcome here. Petitioner’s reliance on conclusory assertions, unsupported expert testimony, and speculative interpretations only reinforces that no prima facie case of unpatentability has been presented.

Because the Petition does not demonstrate that the asserted prior art teaches or suggests each and every element of the challenged claims, and fails to present a legally or technically coherent theory of obviousness, institution under § 314(a) is not warranted. The Board should therefore deny the Petition in its entirety.

Respectfully submitted,

Dated: April 9, 2025

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CERTIFICATE OF COMPLIANCE WITH WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), I certify that this Patent Owner Preliminary Response complies with the type-volume limits of 37 C.F.R. § 42.24(b)(1) because it contains 8,002 words, excluding the parts of this Patent Owner's Preliminary Response that are exempted by 37 C.F.R. § 42.24(a), according to the word processing system used to prepare this Patent Owner's Preliminary Response.

Respectfully submitted,

Dated: April 9, 2025

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CERTIFICATE OF SERVICE

The undersigned certifies that pursuant to 37 C.F.R. § 42.6(e), a copy of the foregoing **PATENT OWNER'S PRELIMINARY RESPONSE** was served via email (as consented to by counsel) on April 9, 2025 to lead and backup counsel of record for Petitioners as follows:

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