

**UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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TESLA, INC.,  
Petitioner,

v.

INTELLECTUAL VENTURES II LLC,  
Patent Owner.

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

**PETITION FOR *INTER PARTES* REVIEW  
UNDER 35 U.S.C. § 312 AND 37 C.F.R. § 42.104**

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**PETITIONER’S EXHIBIT LIST**

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| Ex.1001 | U.S. Patent No. 11,206,670 to P. Young (“’670 patent”)                                                                                          |
| Ex.1002 | Prosecution File History of U.S. Patent Application No. 17/184,127 issued as the ’670 Patent (“’670 File History”)                              |
| Ex.1003 | Declaration of Zhi Ding, Ph.D. under 37 C.F.R. § 1.68                                                                                           |
| Ex.1004 | Curriculum Vitae of Zhi Ding, Ph.D.                                                                                                             |
| Ex.1005 | U.S. Patent Application Publication No. 2012/0327895 by A. Wallen et al. (“Wallen”)                                                             |
| Ex.1006 | U.S. Provisional Application No. 61/501,547 (“Wallen-Prov”)                                                                                     |
| Ex.1007 | U.S. Patent Application Publication No. 2011/0269475 to F. Berggren et al. (“Berggren”)                                                         |
| Ex.1008 | WIPO Publication WO 2010/117240 to M. Noh et al. (“Noh”)                                                                                        |
| Ex.1009 | WIPO Publication WO 2012/084001 to M. Sagfors, et al. (“Sagfors”)                                                                               |
| Ex.1010 | U.S. Patent Application Publication No. 2012/0327894 to J. Axmon et al. (“Axmon”)                                                               |
| Ex.1011 | U.S. Provisional Application No. 61/501,310 to J. Axmon et al. (“Axmon-Prov”)                                                                   |
| Ex.1012 | Prosecution history of U.S. Patent No. 10,939,446                                                                                               |
| Ex.1013 | IV’s Preliminary Infringement Contentions for the ’670 patent, <i>Intellectual Ventures II, LLC v. Tesla, Inc.</i> , No. 6:24-cv-188-ADA (WDTX) |
| Ex.1014 | IV’s Complaint, <i>Intellectual Ventures II, LLC v. Tesla, Inc.</i> , No. 6:24-cv-188-ADA (WDTX)                                                |
| Ex.1015 | Proposed Scheduling Order, <i>Intellectual Ventures II, LLC v. Tesla, Inc.</i> , No. 6:24-cv-188-ADA (WDTX)                                     |

|         |                                                                                                                                    |
|---------|------------------------------------------------------------------------------------------------------------------------------------|
| Ex.1016 | Statistics on District Court Timing                                                                                                |
| Ex.1017 | Interim Procedure for Discretionary Denials in AIA Parallel District Court Litigation, June 21, 2022                               |
| Ex.1018 | GB 1201000, filed January 20, 2012                                                                                                 |
| Ex.1019 | U.S. Patent Application Publication No. 2013/0083749 to H. Xu et al.                                                               |
| Ex.1020 | IV's Preliminary Infringement Contentions Cover Pleading, Intellectual Ventures II, LLC v. Tesla, Inc., No. 6:24-cv-188-ADA (WDTX) |

## I. INTRODUCTION

U.S. Patent No. 11,206,670 (“the ’670 patent,” Ex.1001) is directed to solving a problem in fourth generation (4G) cellular wireless networks that had already been solved—accommodating both Long Term Evolution (LTE) devices and machine type communication (MTC) devices, which are cheaper than LTE devices and require smaller frequency bandwidths. The solution described and broadly claimed by the ’670 patent was similarly known—signaling information to MTC devices using spare bits in the pre-existing Master Information Block (MIB). The Wallen reference (Ex.1005), for example, discloses this precise solution. *See, e.g.,* Ex.1005, [0065] (“[T]he LTE standard defines a MIB such that it includes spare bits. **These spare bits can be used for conveying the MTC related information...**”).

Accordingly, pursuant to 35 U.S.C. §§ 311, 314(a), and 37 C.F.R. § 42.100, Tesla, Inc. (“Petitioner”) respectfully requests that the Board review and cancel as unpatentable under (pre-AIA) 35 U.S.C. §103(a) claims 1-18 (hereinafter, the “Challenged Claims”) of the ’670 patent.

## II. GROUNDS FOR STANDING

Petitioner certifies that the ’670 patent is eligible for IPR and that Petitioner is not barred or estopped from requesting IPR challenging the patent claims. 37 C.F.R. § 42.104(a).

### III. NOTE

Petitioner cites to exhibits' original page numbers, unless noted otherwise.

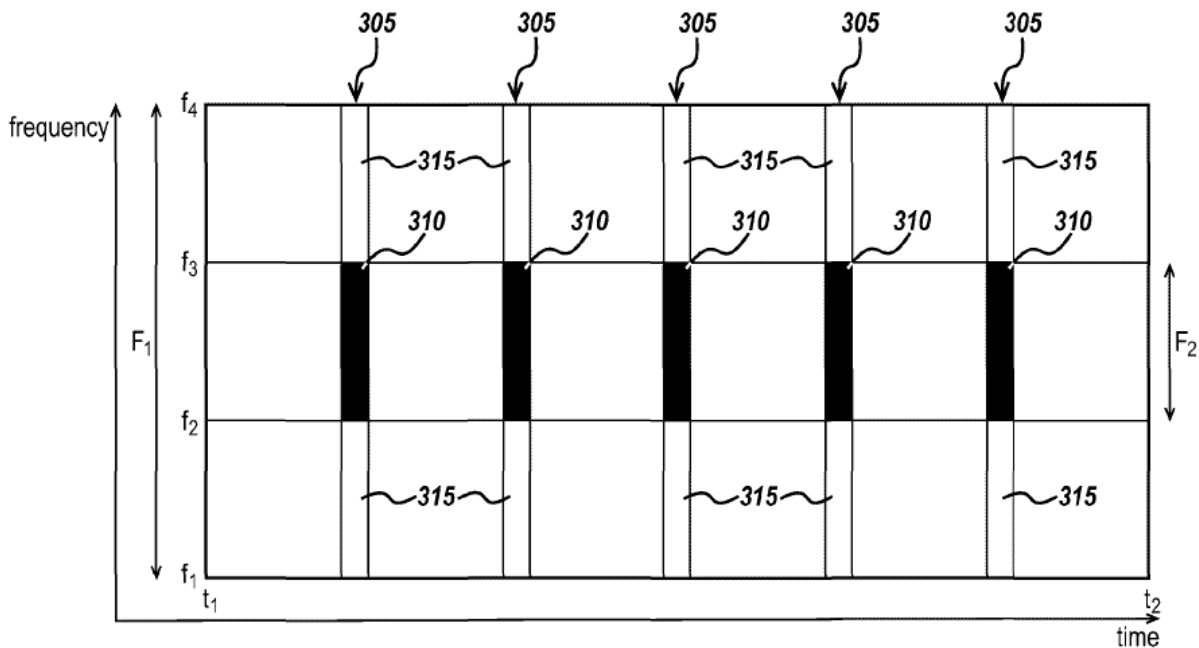
**Emphasis** in quoted material has been added. Claim terms are presented in *italics*.

### IV. THE '670 PATENT

The '670 patent explains that the advent of fourth generation (4G) cellular technology, referred to as Long Term Evolution (LTE), provides for “enhanced data rates” to “support a more sophisticated range of services” compared to “previous generations of mobile telecommunication systems.” Ex.1001, 1:29-50. At the same time, there has been a “parallel development” of “so-called machine type communication (MTC)” devices that, “rather than taking advantage of the high data rates available, instead take advantage of the robust radio interface and increasing ubiquity of the coverage area” to communicate “small amounts of data on a relatively infrequent basis.” *Id.*, 1:54-65. Thus, the '670 patent expresses a desire to provide enhanced data rates and sophisticated services in LTE for more complex and powerful devices, such as a smartphone, while at the same time accommodating and providing simpler services to MTC devices. *See id.*, 2:3-25.

The '670 patent explains more generally that LTE devices may communicate via a “host carrier” and an MTC device may communicate via a “subordinate carrier.” *Id.*, 7:33-36, 2:48-46. A “host carrier,” spanning frequency band  $F_1$ , and a “subordinate carrier,” spanning frequency band  $F_2$ , are shown in

FIG. 3 below. *See id.*, 8:23-33.



Ex.1001, Figure 3

The '670 patent acknowledges the LTE standards describe certain synchronization signals, namely “Primary Synchronisation Signals – PSS, and Secondary Synchronisation Signals – SSS,” and system information (included in a Master Information Block, or MIB) residing within the smallest bandwidth, 1.4 MHz, of any of the six available system bandwidths in a given geography, which range from 1.4 MHz up to 20 MHz. Ex.1001, 9:32-55. An MIB was known in LTE to carry “the most fundamental system information.” *Id.*

System bandwidth in LTE can be expressed in terms of “resource blocks,” which represent a unit of time and frequency resources. Ex.1001, 9:11-16. The

'670 patent explains that a resource block is defined in prior art LTE systems as occupying a certain number of symbol periods (units of time) and a certain number of frequency subcarriers (units of frequency). Ex.1001, 9:18-25.

The '670 patent addresses a problem that MTC communication devices would be required to receive the full system bandwidth of up to 20 MHz to receive all system information if changes are not made in LTE networks to accommodate these devices. Ex.1001, 9:65-10:2 (“Terminal devices with a lower bandwidth capability ... may mean that such devices are unable to operate properly on ... networks which specify higher bandwidth capabilities.”). The '670 patent proposes that the “MTC subordinate carrier indicator flag may be signalled in one (or more) of the MIB bits that are spare in LTE Release 8/9/10 (10 bits are currently spare).” Ex.1001, 13:34-37.

Claim 1 of the '670 patent generally recites the standard procedure in legacy LTE systems of receiving the PSS, SSS, and MIB in a “*first bandwidth*” that is a “*first portion of the cell bandwidth*.” In the context of this standard procedure, it recites steps to accommodate certain devices, for example MTC devices (although the type of device is not specified in the claim):

[1.4] *wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information...*

[1.6] *wherein the indicated frequency resources and the time resources include control information for use by the UE to acquire a system information block 1.*<sup>1</sup>

As shown herein, Wallen (Ex.1005) likewise relates to the same problem addressed by the '670 patent of how to accommodate MTC devices in LTE networks and solves the problem in the same way – by allocating spare bits of legacy MIB messages to indicate to MTC devices the locations in time and frequency where pointers to system information blocks (SIBs) can be obtained. *See, e.g.*, Ex.1005, [0065] (“These [MIB] spare bits can be used for conveying the MTC-related information, such as time- and/or frequency-wise locations of resource blocks ... that the MTC device needs to receive and decode for further information to be able to connect to” a cell.); [0067] (“[T]he MIB 901 indicates the resource blocks allocated to a specific M-PDCCH... The M-PDCCH supplies ... downlink assignments pointing to the SIBs that are intended for this MTC device.”); Ex.1006 (Wallen-Prov), 9.<sup>2</sup>

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<sup>1</sup> Limitation numbering from Section X.C.4 was added.

<sup>2</sup> As shown in Section X.C.1, Wallen (Ex.1005) is entitled to the filing date of its provisional application (“Wallen-Prov,” Ex.1006) for prior art purposes.

## **V. PROSECUTION HISTORY**

Application No. 17,184,127 (“the ’127 application”) that led to the ’670 patent was filed on February 24, 2021. The ’127 application claims the benefit of several continuation applications, Ex.1002, 178-179, and also claims priority to GB 1201000 (Ex.1018), filed on January 20, 2012, Ex.1002, 179. The ’127 application was filed with a Track One request. Ex.1002, 127.

A non-final rejection was issued shortly after filing. In the rejection, claims 1-21 were rejected as obvious over Xu (U.S. 2013/0083749) (Ex.1019) in view of Axmon (U.S. 2012/0327894) (Ex.1010). The Office Action relied on Axmon as disclosing “the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information.” Ex.1002, 97-99 (citing Ex.1010, [0106]-[0107]). Claims 1-21 were also rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-15 of parent Application No. 16/190,420 (issued as U.S. 10,939,446) (Ex.1012). Ex.1002, 95-96.

Applicant filed a response alleging that neither Xu nor Axmon qualify as prior art. Ex.1002, 65-67. Specifically, Applicant asserted without proof that the ’127 application is entitled to the benefit of GB 1201000.5, filed on January 20, 2012, whereas the non-provisional filing dates of the applications for both Xu and Axmon are after January 20, 2012. Thus, according to Applicant, the provisional

applications leading to both Xu and Axmon must be relied upon. Ex.1002, 65-67.

With regard to Axmon, Applicant argued: “[T]he Axmon provisional application [(61/501,310) (Ex.1011)] provides no information stating the MIB includes information that identifies one or more possible upcoming locations in terms of time/frequency.” Ex.1002, 67. Applicant also filed a terminal disclaimer with respect to parent Application No. 16/190,420 (U.S. 10,939,446). Ex.1002, 45. Applicant thereafter conducted an Examiner Interview and agreed to an Examiner’s amendment that added the following limitation to claim 1: “*wherein the indicated frequency resources and the time resources include control information for use by the UE to acquire a system information block 1*” (limitation [1.6] below). Ex.1002, 16, 21. The Examiner subsequently issued a Notice of Allowance. Ex.1002, 9.

Although not stated during prosecution, Petitioner notes that the published Axmon application discloses the added limitation of “*wherein the indicated frequency resources and the time resources include control information for use by the UE to acquire a system information block 1*” as follows:

In one aspect, the **MIB 1501** (which occupies its standard location in the host cell) **includes time/frequency information (represented by the number “1” enclosed in a circle) that informs the MTC device of a location of the resource blocks** and/or modulation and coding

scheme (MCS) allocated to the first system information block (SIB1) that is transmitted in a system standardized location (e.g., in subframe 5 in an LTE system).

Ex.1010, [0126].

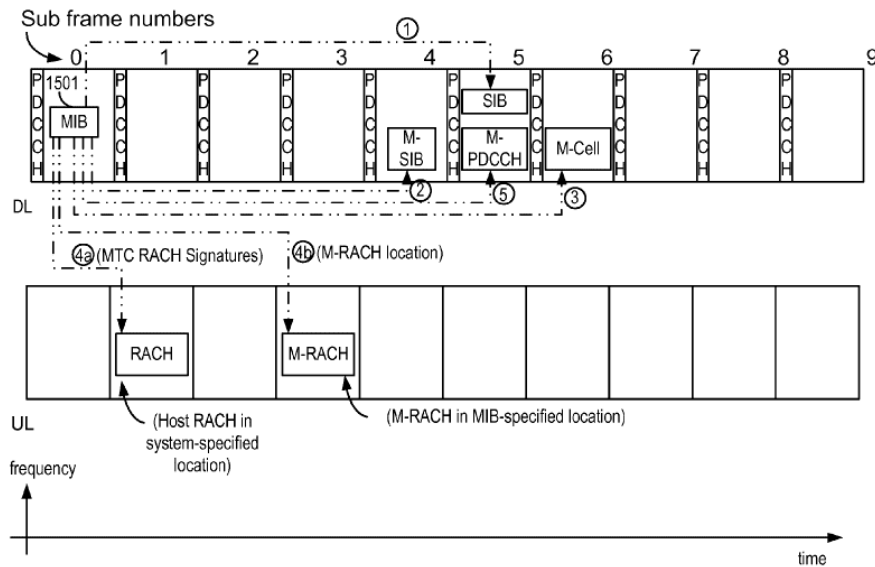


FIG. 15  
Axmon, Figure 15

The Axmon Provisional (61/501,310, Ex.1011) does not include this disclosure.

*See generally* Ex.1011.

The inventors of the Axmon Provisional, however, filed another provisional application the same day (Wallen-Prov, Ex.1006) that does have the disclosure corresponding to the limitation added to gain allowance. *See, e.g.*, Ex.1006, Figure 1 below.

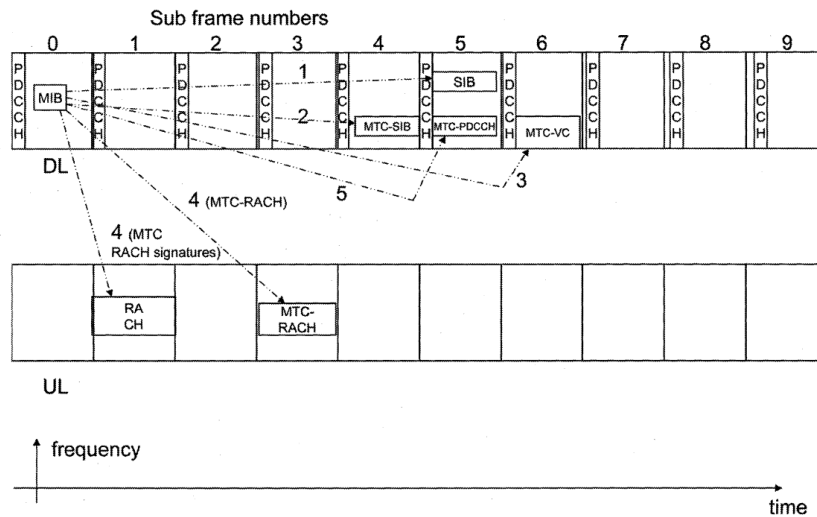


**Figure 1:** Time/frequency grid and sketch over how MIB can point out relevant information for MTC devices according to the invention.

### Ex.1006, Figure 1

The non-provisional application corresponding to this provisional application (Wallen, Ex.1005) was not substantively applied by the Examiner during prosecution of the '670 patent. *See* Ex.1002, 76-84 (Wallen was only listed in an Information Disclosure Statement along with over 50 other references). The Examiner thus erred in issuing the '670 patent over the Wallen reference, as shown in this Petition.

With respect to the prosecution of U.S. Patent No. 10,939,446 (the subject of the terminal disclaimer during prosecution of the '670 patent), there were several rejections during prosecution, but Wallen was not applied in any rejection. Ex.1012, 142-149 (first Office Action); 115-123 (second Office Action); 84-85 (third Office Action); 65-73 (fourth Office Action). As in the '670 patent

prosecution, Wallen was only listed in an Information Disclosure Statement (IDS) along with over 40 other references. Ex.1012, 154-161.

Thus, Wallen was not applied in any rejection during the prosecution history of the '670 patent or the prosecution history of the parent tied via terminal disclaimer to the '670 patent, U.S. Patent No. 10,939,446.

## **VI. PRIORITY DATE OF THE '670 PATENT**

The earliest priority date on the face of the '670 patent is January 21, 2013. The earliest possible priority date of the '670 patent is January 20, 2012, the filing date of the foreign priority application (GB1201000). All the relied-upon prior art predates January 20, 2012.

However, Petitioner does not waive any right or opportunity to dispute the priority date of the '670 patent in this or another forum where the issue is relevant. For example, to the extent Patent Owner asserts that the '670 patent is entitled to the filing date of the foreign priority application (GB1201000), Petitioner reserves the right to contest that showing.

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

A person of ordinary skill in the art ("POSITA") in January 2012 would have been someone knowledgeable and familiar with the wireless communications systems that are pertinent to the '670 Patent. A POSITA would have had a bachelor's degree from an accredited program in electrical engineering, computer

engineering, computer science, or equivalent training, and at least two years of professional experience relating to wireless communication technology. Lack of professional experience can be remedied by additional education, and vice versa. Ex.1003, ¶¶19-21.

## **VIII. CLAIM CONSTRUCTION**

Claim terms in IPR are construed according to their “ordinary and customary meaning” to those of skill in the art. 37 C.F.R. § 42.100(b). Petitioner submits that, for the purposes of this proceeding and the grounds presented herein, no claim term requires express construction. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

## **IX. RELIEF REQUESTED AND THE REASONS FOR THE REQUESTED RELIEF**

Petitioner asks that the Board institute an IPR trial and cancel the Challenged Claims in view of the analysis below.

## **X. IDENTIFICATION OF HOW THE CLAIMS ARE UNPATENTABLE**

### **A. Challenged claims**

Petitioner challenges claims 1-18 (“the Challenged Claims”).

### **B. Statutory grounds for challenges**

| <b>Grounds</b> | <b>Claims</b> | <b>Basis (pre-AIA)</b>                          |
|----------------|---------------|-------------------------------------------------|
| #1             | 1-18          | 35 U.S.C. § 103 over Wallen in view of Berggren |

U.S. Patent Pub. No. 2012/0327895 (“Wallen,” Ex.1005) was filed on February 16, 2012, and claims the benefit of Provisional Application No. 61/501,547, filed on June 27, 2011 (“Wallen-Prov,” Ex.1006). As discussed below, Wallen is prior art under pre-AIA 35 U.S.C. § 102(e) as of the filing date of Wallen-Prov.<sup>3</sup>

Wallen is entitled to the June 27, 2011 filing date of Wallen-Prov “if the disclosure of the provisional application provides support for the claims in the reference patent in compliance with § 112, ¶ 1.” *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1381 (Fed. Cir. 2015). The Manual of Patent Examining Procedure (MPEP) further clarifies that “at least one claim of the potential reference [Wallen] must be supported by the written description of the

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<sup>3</sup> Wallen is also prior art under pre-AIA 35 U.S.C. § 102(e) as of its **non-provisional** filing date of February 16, 2012 because the ’670 patent is not entitled to claim the benefit of GB 1201000 due to its lack of written description support of the Challenged Claims under pre-AIA 35 U.S.C. §112, first paragraph, such as lack of written description of the limitation *wherein the indicated frequency resources and the time resources include control information for use by the UE to acquire a system information block 1*.

relied upon provisional application [Wallen-Prov],” MPEP § 2136.I(B), which is satisfied here. *See also Amgen Inc. v. Sanofi*, 872 F.3d 1367, 1380 (Fed. Cir. 2017); *In re Giacomini*, 612 F.3d 1380 (Fed. Cir. 2010).

As shown in the claim chart below, Wallen-Prov (Ex.1006) provides support for independent claim 1 of Wallen (Ex.1005). *See also* Ex.1003, Section X.

| Claim 1                                                                                                                              | Support in Wallen-Prov (Ex.1006)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1.0] <i>A method of operating a network node that serves a host cell in a cellular communication system, the method comprising:</i> | <p>Wallen-Prov’s context is cellular communication systems. For example, in the “Technical Overview” section, Wallen-Prov recites:</p> <p style="padding-left: 40px;"><b>Cellular systems</b> like WCDMA and LTE transmit broadcast information on a regular basis.<br/>Ex.1006, 7.</p> <p>Background on the techniques presented in Wallen-Prov relate to system information designed to provide “cell specific” information:</p> <p style="padding-left: 40px;">SIB then includes more <b>cell specific information</b>, for instance information needed for the mobile terminal to be able to do random access, via the RACH.<br/>Ex.1006, 7.</p> <p>Wallen-Prov describes mobile terminals (or UEs) communicating with base stations” in a network:</p> <p style="padding-left: 40px;">As shown in Figure 5, the <b>example network may include</b> one or more instances of user equipment (UEs) and <b>one or more base stations</b> capable of communicating with these UEs, along with any additional elements suitable to support communication between UEs or between a UE and another communication device (such as a landline telephone).<br/>Ex.1006, 12.</p> |

Wallen-Prov describes the transmission of an “extended MIB [Master Information Block]” for an MTC [machine-type communication] device to connect to the cell:

Figure 4 shows a second embodiment of how an MTC utilizes the extended MIB **for connection to the cell.**  
Ex.1006, 11

Wallen-Prov’s base station, an example of the claimed “*network node that serves a host cell in a cellular communication system,*” transmits the various messages of Figure 1 on the “DL” or downlink. *See* Figure 1.

Furthermore, Wallen-Prov describes an “eNB” generating an “MIB” that provides “information for being able to connect to the cell/eNB”:

Figure 2 shows a flow chart over an eNB embodiment according to particular embodiments of the disclosure. **The eNB generates the MIB.** First MIB information according to (Rel-10) standard (Mobile broadband devices) of the LTE is generated (100). Then MIB information related to MTC devices (110) is generated (the order could be changed between {110} and (100)). **A subset of the spare bits in the MIB is used for this message. The MTC information points out some RBs or REs in the time frequency grid an MTC device needs to receive and decode for further information to be able to connect to the cell/eNB.**

Ex.1006, 10. The term “eNB” (also referred to as “eNodeB”) is well-known in LTE as referring to an LTE base station. *See, e.g.,* Ex.1008, [0037] (A base station in LTE may be referred to “as an evolved-NodeB (eNB).”); Ex.1007, [0004] (The term “eNodeB” is “generally used” to “denot[e] a base station of” an LTE system).

In summary, Wallen-Prov describes a method of transmitting an MIB from a base station so that an MTC device can connect to the base station and the associated cell served by the base

|                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                         | station, thereby supporting “a method of operating a network node that serves a host cell in a cellular communication system.” Ex.1003, 91-92.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| [1.1] <i>at one or more first time intervals, transmitting first control channel information on a control channel that extends over a first bandwidth of a radiofrequency resource,</i> | <p>Wallen-Prov describes the use of a physical downlink control channel (PDCCH) (“a control channel”) carrying information, e.g., “positions used” for SIB and “modulation and coding scheme (MCS) used for SIB,” (“first control channel information on a control channel”), and the PDCCH (“control channel”) occupies the “whole system bandwidth” (“extends over a first bandwidth of a radiofrequency resource”):</p> <p style="padding-left: 40px;">The position used for <b>the SIB</b> redundancy versions are determined by <b>decoding the PDCCH</b>, which points out the RBs used on the PDSCH. The modulation and coding scheme (MCS) used for the SIBs are also signalled <b>on the PDCCH</b>. The PDCCH itself occupies the whole system bandwidth...</p> <p>Ex.1006, 7.</p> <p>As illustrated in Figure 1, the PDCCH is transmitted in a time interval at the beginning of each subframe (“at one or more first time intervals”), and the PDCCH occupies the system bandwidth (“a control channel that extends over a first bandwidth of a radiofrequency resource”).</p> |

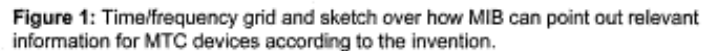


**Figure 1:** Time/frequency grid and sketch over how MIB can point out relevant information for MTC devices according to the invention.

Wallen-Prov, Figure 1 (annotated); Ex.1003, 93

Thus, Wallen-Prov supports limitation [1.1]. Ex.1003, 92-93.

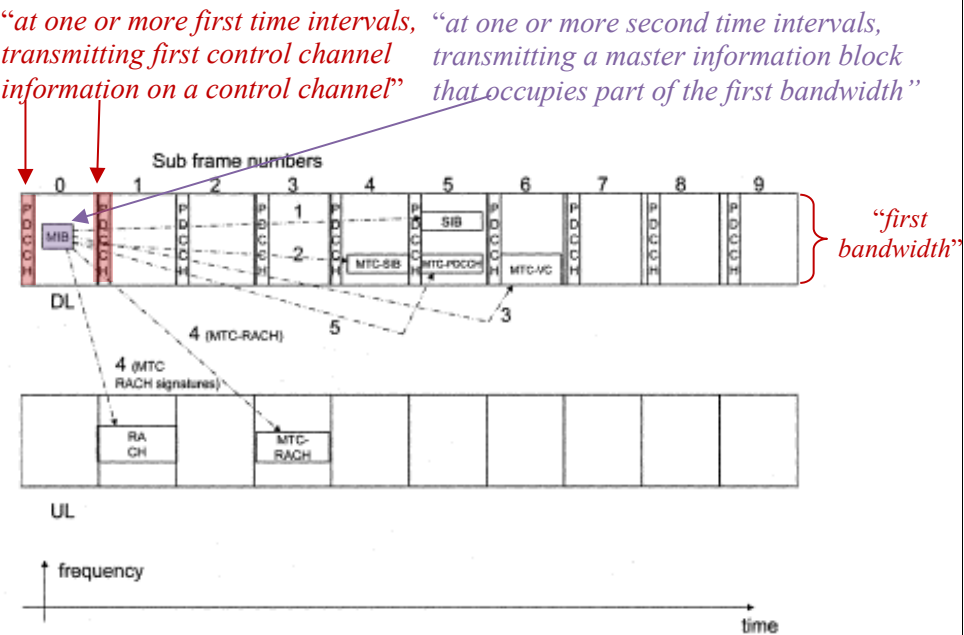
[1.2] wherein the first control channel communicates information that is necessary to enable a first type of communication device to establish a connection with the host cell,

Wallen-Prov’s PDCCH communicates information that is necessary for current LTE mobile terminals/UEs (*first type of communication device*) to be able to receive permission to camp on a cell as well as receive connection setup parameters, which discloses limitation [1.2]. For example, the PDCCH provides information for receiving SIBs, which in turn provides “**cell specific information**, for instance information needed for the mobile terminal to be able to do random access,” Ex.1006, 7, thereby describing limitation [1.2]. Ex.1003, 92-93.

Cellular systems like WCDMA and LTE transmit broadcast information on a regular basis. **Such broadcast information is needed in order for the mobile terminal to be able to determine permission to camp on a cell as well as connection setup parameters. In both LTE and WCDMA the broadcast information is divided into Master**

|                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                  | <p><b>Information Block (MIB) and System Information Block (SIB).</b> ... SIB then includes more cell specific information, for instance information needed for the mobile terminal to be able to do random access, via the RACH. ...</p> <p>... <b>The position used for the <u>SIB</u> redundancy versions are determined by <u>decoding the PDCCH</u>,</b> which points out the RBs used on the PDSCH. <b>The modulation and coding scheme (MCS) <u>used for the SIBs</u> are also signalled <u>on the PDCCH</u>.</b> The PDCCH itself occupies the whole system bandwidth, which forces <b><u>current LTE terminals</u></b> to adapt its receiver bandwidth to the system bandwidth in order to be able to receive the SIB.</p> <p>Ex.1006, 7.</p> <p>Thus, an LTE terminal (<i>a first type of communication device</i>) receives control information on the PDCCH (<i>first control channel communicates information</i>) to be able to receive SIBs, which in turn carries permission for the LTE terminal to “camp on a cell” and other “connection setup parameters” (<i>necessary ... to establish a connection with the host cell</i>) among other information, thereby supporting <i>the first control channel communicates information that is necessary to enable a first type of communication device to establish a connection with the host cell</i>, in limitation [1.2]. Ex.1003, 93-94.</p> |
| <p>[1.3] <i>the first type of communication device being capable of receiving a signal having the first bandwidth of the</i></p> | <p>As described in the analysis of limitation [1.2], Wallen-Prov describes LTE mobile terminals (“<i>first type of communication device</i>”) receiving a PDCCH (“<i>receiving a signal</i>”) by adapting receiver bandwidth to the system bandwidth (“<i>first bandwidth of the radiofrequency resource</i>”), thereby supporting limitation [1.3].</p> <p>The position used for the SIB redundancy versions are <b>determined by decoding the PDCCH</b>, which points out the RBs used on the PDSCH. ... <b>The PDCCH itself occupies the whole system bandwidth, which</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

|                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><i>radiofrequency resource; and</i></p>                                                                                                                                    | <p><b>forces current LTE terminals to adapt its receiver bandwidth to the system bandwidth</b> in order to be able to receive the SIB.<br/>Ex.1006, 7; Ex.1003, 95.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <p>[1.4] <i>at one or more second time intervals, transmitting a master information block that occupies a part of the first bandwidth of the radiofrequency resource,</i></p> | <p>Wallen-Prov's full system bandwidth may be up to 20 MHz ("first bandwidth"):<br/>Using LTE as defined according to current standardization releases requires support of up to <b>20 MHz system bandwidth</b>.<br/>Ex.1006, 8.</p> <p>The MIB ("<i>master information block</i>") occupies only 1.4 MHz ("<i>a part of the first bandwidth of the radiofrequency resource</i>"):<br/>Cell search and MIB could be received assuming only 1.4 MHz bandwidth.<br/>Ex.1006, 8.</p> <p>Then the MTC device receives and decodes the MIB (210) (also only occupying a bandwidth of 6 RBs, i.e., 1.4 MHz).<br/>Ex.1006, 10.</p> <p>As shown in Figure 1, the MIB occupies a time interval ("<i>one or more second time intervals</i>") that is different than the time interval(s) used for the PDCCH ("<i>one or more first time intervals</i>"). Because the PDCCH is transmitted in the entire system bandwidth, the MIB necessarily is transmitted at a different time because there is no remaining bandwidth for the MIB during PDCCH transmission. Ex.1003, 95.</p> |

|                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                       | <p>“at one or more first time intervals, transmitting first control channel information on a control channel”</p> <p>“at one or more second time intervals, transmitting a master information block that occupies part of the first bandwidth”</p>  <p>Figure 1: Time/frequency grid and sketch over how MIB can point out relevant information for MTC devices according to the invention.</p>                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <p>[1.5] wherein the part of the first bandwidth of the radiofrequency resource has a second bandwidth that is smaller than the first bandwidth and is receivable by a second type of communication device having</p> | <p>Wallen-Prov, Figure 1 (annotated); Ex.1003, 96</p> <p>Thus, an MIB transmitted in 1.4 MHz at a different time interval than the PDCCH, which occupies the entire system bandwidth of up to 20 MHz, supports limitation [1.4]. Ex.1003, 95-96.</p> <p>The bandwidth used for the MIB is only 1.4 MHz (“the part of the first bandwidth of the radiofrequency resource has a second bandwidth”), which is smaller than the system bandwidth of up to 20 MHz (“first bandwidth”), and is receivable by a machine-type communication (MTC) device (“receivable by a second type of communication device”) having reduced receive bandwidth capabilities compared to those of legacy LTE devices (“having reduced receive bandwidth capabilities compared to those of the first type of communication device”). Ex.1003, 95-96.</p> <p>Legacy LTE devices need to support up to 20 MHz system bandwidth:</p> |

|                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><i>reduced receive bandwidth capabilities compared to those of the first type of communication device,</i></p> | <p>Using LTE as defined according to current standardization releases requires support of up to 20 MHz system bandwidth.<br/>Ex.1006, 8.</p> <p>MTC devices operate at lower bandwidths:<br/>Machine type communication (MTC) devices utilizing a cellular system for communication has become increasingly popular. MTC typically requires only low data rate for signaling of small amount of data. One example of an MTC device is sensors. ... Furthermore, <b>MTC devices supporting low data rates only need a small system bandwidth (up to some few MHz).</b>...<br/>According to the arguments above, <b>it is beneficial to restrict MTC devices to operate at lower system bandwidths than 20 MHz.</b><br/>Ex.1006, 8.</p> <p><b>The MTC device only needs to support a subset of the cell system bandwidth, and might also have different requirements on response time compared to legacy LTE mobile broadband devices.</b><br/>Ex.1006, 10.</p> <p>In summary, MTC devices (“<i>second type of communication device</i>”) are contrasted with legacy LTE devices (“<i>first type of communication device</i>”) as needing to support only a subset of the cell system bandwidth (“<i>reduced bandwidth capabilities compared to those of the first type of communication device</i>”), thereby supporting limitation [1.5]. Ex.1003, 96-97.</p> |
| <p>[1.6] <i>wherein the master information block comprises a first part and a second part,</i></p>                | <p>Wallen-Prov discloses an “extended” MIB that uses a subset of the 10 spare bits in the LTE MIB (“<i>second part</i>”) that are not currently used to carry information (“<i>first part</i>”). In other words, the extended MIB includes a first part that has bits already used to carry information for LTE devices and a second part that includes spare bits not currently used to carry information for LTE devices:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

This disclosure proposes an extended Master Information Block including a bit sequence pointing out a subset of Resource Elements (RE) and/or Resource Blocks (RB) in the time and frequency grid. This can easily be made by **utilizing a subset of the 10 spare bits in the LTE MIB currently not used to carry information.**

Ex.1006, 9.

Figure 2 illustrates the first part and second part of the MIB, noting “first MIB information” (*first part*) and “Extended MIB information bits” (*second part*):

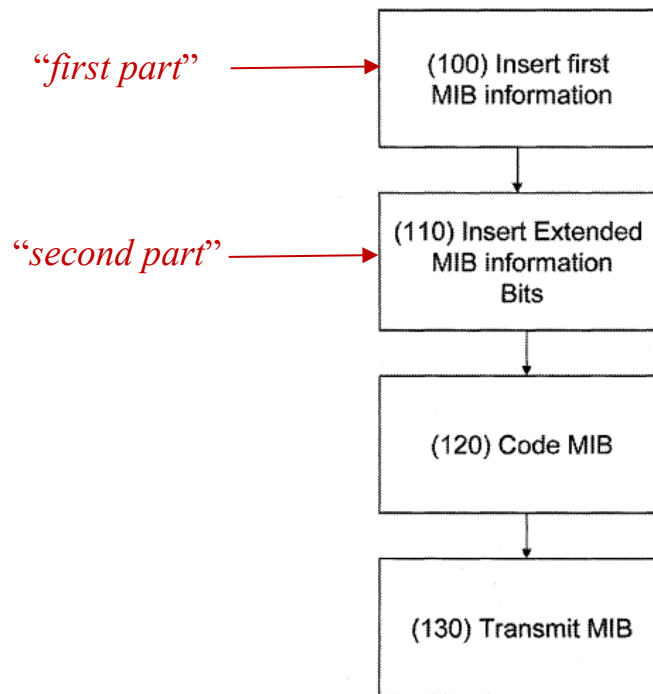


**Figure 2:**  
Flow Chart eNB  
embodiment

Wallen-Prov, Figure 2 (annotated); Ex.1003, 99

The description of Figure 2 also describes the different parts of the MIB:

The eNB generates the MIB. **First MIB information** according to (Rel-10) standard

|                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                      | <p>(Mobile broadband devices) of the LTE is generated (100). Then <b>MIB information related to MTC devices</b> (110) is generated (the order could be changed between (110) and (100)). A subset of the <b>spare bits in the MIB</b> is used for this message.</p> <p>Ex.1006,10. The “First MIB information” is an example of the claimed “<i>first part</i>” and the “MIB information related to MTC devices” is an example of the claimed “<i>second part</i>.” Ex.1003, 97-99.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p>[1.7.1] <i>wherein the first part comprises first part information that is necessary to enable the first type of communication device to establish the connection with the host cell, and [1.7.2] wherein the second part comprises second part information that directly or indirectly enables the second type of communication device to obtain parameters that enable the second type of communication</i></p> | <p>The part of the MIB currently used to carry system information is for legacy LTE terminals to connect to the host base station/cell:</p> <p>Cellular systems like WCDMA and LTE transmit broadcast information on a regular basis. <b>Such broadcast information is needed in order for the mobile terminal to be able to determine permission to camp on a cell as well as connection setup parameters.</b> In both LTE and WCDMA the broadcast information is divided into Master Information Block (MIB) and System Information Block (SIB). <b>In the MIB, the most important system information like frame timing is transmitted.</b></p> <p>Ex.1006, 7. This information is the described “First MIB information” (<i>first part/first part information</i>) in the MIB for legacy LTE standard devices:</p> <p>The eNB generates the MIB. <b><u>First MIB information</u> according to (Rel-10) standard (Mobile broadband devices) of the LTE is generated (100).</b> Then MIB information related to MTC devices (110) is generated ...</p> <p>Ex.1006, 10 (referring to Figure 2).</p> <p>Thus, “the <u>most important system information</u> like frame timing,” which is necessary for an LTE device (<i>the first type of communication device</i>) to connect to the host cell (<i>necessary to enable the first type of communication device to establish the</i></p> |

|                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><i>device to establish a connection with the host cell.</i></p> | <p><i>connection with the host cell</i>), is inserted in part of the MIB (<i>first part comprises first part information</i>), thereby supporting limitation [1.7.1]. Ex.1003, 99-100.</p> <p>The “spare bits” (<i>second part</i>) in the MIB are used to provide information (<i>second part information</i>) for an MTC device (<i>second type of communication device</i>) to “be able to connect to the cell” (<i>to establish a connection with the host cell</i>):</p> <p>This disclosure proposes an extended Master Information Block including a bit sequence pointing out a subset of Resource Elements (RE) and/or Resource Blocks (RB) in the time and frequency grid. <b><u>This can easily be made by utilizing a subset of the 10 spare bits in the LTE MIB currently not used to carry information.</u></b> This subset of REs and/or RBs pointed out by the bit sequence could include information suitable for <b><u>MTC devices ... to still be able connect to the cell.</u></b> Examples of such information in the MIB are:</p> <ol style="list-style-type: none"><li>1. The RBs and/or MCS allocated to the <b>first system information block (SIB 1)</b> that is transmitted in subframe 5</li><li>...</li><li>4. A set of MTC-specific RACH sequences and/or RACH regions in the time/frequency grid <b>to be used by the MTC device for connection setup.</b></li><li>5. The RBs ... where an MTC can receive and detect control information, <b>including the MTC specific SIBs or downlink assignments pointing to the SIBs.</b></li></ol> <p>Ex.1006, 9.</p> <p>Figure 2 of Wallen-Prov and the associated description further describe information inserted in the spare bits (<i>second part</i>) of an MIB for MTC devices:</p> |
|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>The eNB generates the MIB. First MIB information according to (Rel-10) standard (Mobile broadband devices) of the LTE is generated (100). <b>Then MIB information related to MTC devices (110) is generated</b> (the order could be changed between (110) and (100)). <b>A subset of the <u>spare bits</u> in the MIB is used for this message.</b></p> <p>Ex.1006, 10.</p> <p>The spare bits of an MIB (<i>second part</i>) carrying an indication of RBs in the time/frequency grid that include information “suitable for MTC devices...to still be able [to] connect to the cell,” such as SIBs or other information “for connection setup,” supports “<i>second part information that directly or indirectly enables the second type of communication device [MTC device] to obtain parameters that enable the second type of communication device to establish a connection with the host cell.</i>” Ex.1003, 99-102.</p> |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

In addition, for efficient comparison of the subject matter described in Wallen (Ex.1005) and Wallen-Prov (Ex.1006), Petitioner provides a chart that compares the excerpts and figures in Wallen that are cited in the Petition and the Expert Declaration (Ex.1003) with the corresponding excerpts and figures in Wallen-Prov. *See* Ex.1003, Section IX. Further, in this Petition, Petitioner provides dual citations to Wallen and Wallen-Prov. Thus, Wallen is prior art under pre-AIA 35 U.S.C. § 102(e) as of June 27, 2011, the filing date of Wallen-Prov.

U.S. Patent Pub. No. 2011/0269475 (“Berggren,” Ex.1007) was filed on July 1, 2011 and published on November 3, 2011. Berggren is prior art under pre-AIA 35 U.S.C. §§ 102(a) and 102(e).

Petitioner’s obviousness grounds rely on the combined teachings of the references and not on a physical incorporation of elements. *See In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012); Ex.1003, ¶¶61-63.

Petitioner also cites below to additional prior art as evidence of the background knowledge of a POSITA and to provide contemporaneous context to support Petitioner’s assertions regarding what a POSITA would have understood from the prior art in the grounds. *See Yeda Research v. Mylan Pharm. Inc.*, 906 F.3d 1031, 1041-1042 (Fed. Cir. 2018) (affirming the use of “supporting evidence relied upon to support the challenge”); 37 C.F.R. § 42.104(b); *see also K/S HIMPP v. Hear-Wear Techs., LLC*, 751 F.3d 1362, 1365-66 (Fed. Cir. 2014); *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1363 (Fed. Cir. 2016).

**C. Ground 1: Claims 1-18 are obvious over Wallen in view of Berggren**

**1. Wallen**

Like the ’670 patent, Wallen recognizes that it is desirable for low-bandwidth MTC devices to connect to pre-existing, high-bandwidth LTE networks. Ex.1005, [0016] (It is “desirable to have methods and apparatuses that enable an MTC device to retain its relatively low performance characteristics (e.g., in terms of size of bandwidth supported and/or processing power) and yet be capable of connecting to a modern-day cellular communications system, such as but not

limited to an LTE system.”); Ex.1006, 8; Ex.1003, ¶52.

Wallen provides a solution to this problem by using “spare bits” of an MIB, which are not otherwise used, to “convey MTC-related information, such as time- and/or frequency-wise locations of resource blocks or resource elements that the MTC device needs to receive and decode for further information to be able to connect to the” network. Ex.1005, [0065]; Ex.1006, 9; Ex.1003, ¶53..

Wallen describes several types of information that can be indicated for MTC devices using the MIB, including:

(1) “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.1005, [0068]; Ex.1006, 9; and

(2) “resource blocks ... allocated to a specific M-PDCCH [which] ... 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.” Ex.1005, [0072]; Ex.1006, 9; Ex.1003, ¶54.

Thus, Wallen discloses an MIB identifying the location of “resource blocks,” which were known units of LTE resources representing a certain number of units of time (OFDM symbols) and units of frequency (OFDM subcarriers). Ex.1003, ¶54 (citing Ex.1008, [0040]-[0047]). In other words, the MIB indicates to a receiver where in frequency and time to find certain control messages. Ex.1003,

¶54.

Figure 9 of Wallen illustrates several examples of how an MIB can indicate (or point to) time and frequency resources where various MTC control messages are located (see arrows labeled 1, 2, 3, and 5 in annotated Figure 9). Ex.1005, [0068]-[0070], [0072]; Ex.1006., 9.

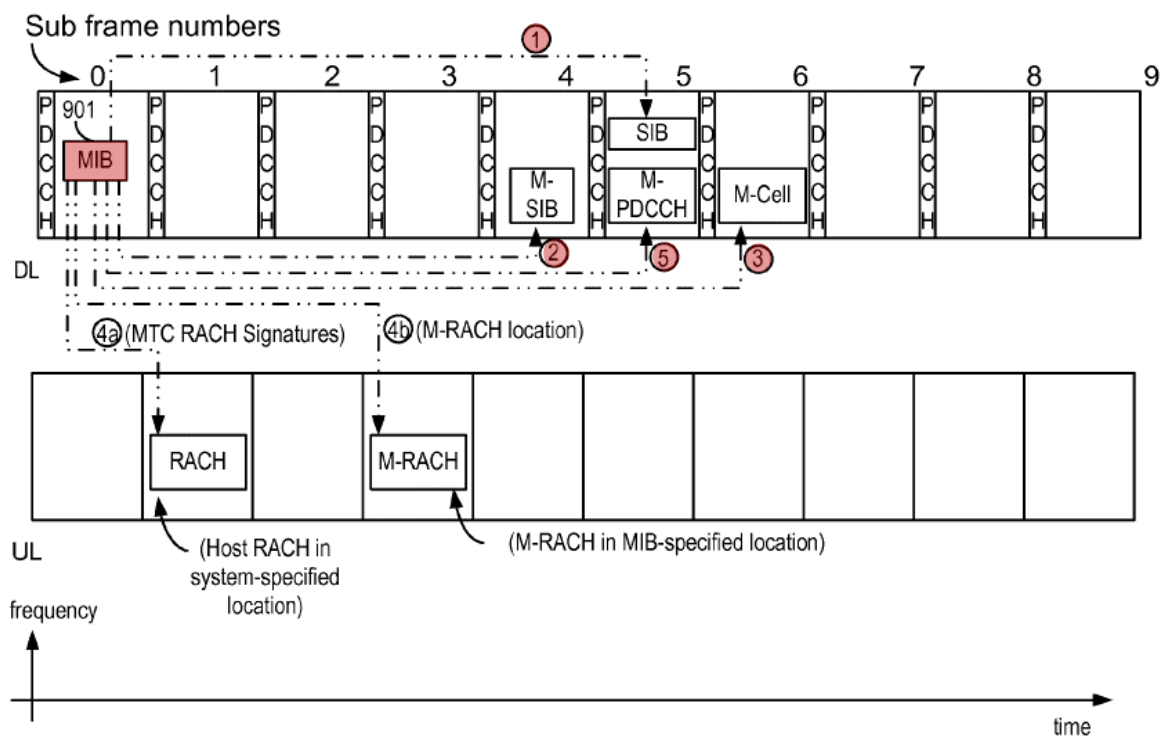


FIG. 9

Ex.1005, Figure 9 (annotated); Ex.1006, Figure 1; Ex.1003, ¶55

## 2. Berggren

Berggren relates to LTE systems, including how a UE detects and synchronizes to a cell by receiving synchronization signals, and then acquires system information for operating within a cell. Ex.1007, [0074] (“For establishing

a connection to a cell in LTE, a UE first detects and synchronizes to the cell by receiving the synchronization signals, and then acquires the system information needed for operating within a cell.”). Ex.1003, ¶56.

As explained by Berggren, the LTE standard specifies that a physical broadcast channel (PBCH) carries an MIB. Ex.1007, [0074] (“[T]he so called master information block (MIB) [] ... is transmitted ... on the BCH (Broadcast Channel). The BCH ...is mapped to the PBCH (Physical BCH).”). Berggren also presents the various system bandwidth configurations that are available in LTE and the number of resource blocks (RBs) associated with a particular bandwidth. Ex.1003, ¶57.

TABLE 1

| Channel bandwidth<br>[MHz] | Transmission band-<br>width configuration<br>[RBs] |
|----------------------------|----------------------------------------------------|
| 1.4                        | 6                                                  |
| 3                          | 15                                                 |
| 5                          | 25                                                 |
| 10                         | 50                                                 |
| 15                         | 75                                                 |
| 20                         | 100                                                |

Berggren, Table 1

### **3. Reasons to combine Wallen and Berggren**

It would have been obvious to a POSITA to combine Wallen’s system with Berggren’s description of how the LTE standard implements the MIB. In

particular, it would have been predictable and beneficial for Wallen's user equipment to receive the MIB in the physical broadcast channel (PBCH), as was standard in LTE. Ex.1003, ¶58.

*a) Analogous art*

As an initial matter, Wallen and Berggren are each analogous prior art to the '670 patent at least because Wallen and Berggren both pertain to the same field of endeavor as the '670 patent, namely, wireless, cellular communication systems, such as LTE communications systems. Ex.1001, 1:18-21 ("The present invention relates to wireless communications systems and methods..."); 2:23-25 ("[T]here is now a desire to use relatively inexpensive and less complex devices to communicate using LTE type networks."); Ex.1005, [0016] ("It is therefore desirable to have methods and apparatuses that enable an MTC device to retain its relatively low performance characteristics ... and yet be capable of connecting to a modern-day cellular communications system, such as but not limited to an LTE system."); Ex.1006, 8; Ex.1007, [0002] ("The present disclosure relates to a field of wireless communication, especially it relates to a method, apparatus and system for signaling resource partition."); [0004] ("[T]he embodiments of the disclosure will be exemplified for the LTE-Advanced system, and thus for Advanced E-UTRA."); Ex.1003, ¶59.

Wallen and Berggren are also analogous art to the '670 patent because

Wallen and Berggren are reasonably related to the same problem faced by the inventor of the '670 patent of how to accommodate MTC devices in an LTE network without requiring the MTC devices to receive information on the wide spectral bandwidth of the LTE network. *See* Ex.1001, 3:25-42; Ex.1003, ¶60.

Wallen addresses the same problem as the '670 patent. Ex.1005, [0016] (“**It is therefore desirable to have methods and apparatuses that enable an MTC device to retain its relatively low performance characteristics (e.g., in terms of size of bandwidth supported and/or processing power) and yet be capable of connecting to a modern-day cellular communications system, such as but not limited to an LTE system,** that ordinarily imposes higher performance requirements on connecting devices.”); Ex.1006, 8. Berggren is reasonably related to this problem because it presents numerous details about LTE systems that inform the background of a POSITA in addressing the problem of the '670 patent. Ex.1007, [0070]-[0077] (describing various aspects of LTE, including available system bandwidths, the concept of resource blocks, available channels and their operation (PDCCH, PDSCH, PBCH), and salient facts about system information (such as MIB, SIB1, and SIB2)). Ex.1003, ¶60.

***b) Motivation to combine Wallen with Berggren***

A POSITA would have found it obvious for Wallen’s MIB to be implemented consistent with Berggren’s implementation details because doing so

would have been a matter of implementing the MIB according to 3GPP standards. *See, e.g., Samsung Electronics Co., Ltd. et al. v. Netlist Inc.*, IPR2023-00455 Paper 30, 33 (PTAB July 30, 2024) (finding obviousness of implementing according to known standards: “Given JEDEC as the standard, an ordinarily skilled artisan would have reason to pursue such a known option”); Ex.1003, ¶61.

In particular, Wallen’s MTC device is configured to receive an MIB: “The MTC device then receives and decodes the MIB which supplies the MTC device with MTC-specific information....” Ex.1005, [0077]. The MIB was understood as being broadcast in an LTE system. Ex.1005, [0006]; Ex.1006, 7. A POSITA implementing an LTE system would have been motivated to understand which LTE channel carries the MIB, and Berggren provides this implementation detail:

In order to give an understanding of the present disclosure it is first described how the number of primary RBs is communicated in the LTE system... **The downlink system bandwidth is included in the so called master information block (MIB) which contains only a small part of the system information and is transmitted with a periodicity of 40 ms on the BCH (Broadcast Channel). The BCH is a transport channel which in turn is mapped to the PBCH (Physical BCH) which is always located in the 6 central RBs of the component carrier.**

Ex.1007, [0073]-[0074]. Thus, Wallen discloses that an MIB is broadcast, and

Berggren confirms that the LTE's broadcast MIB is carried on a physical broadcast channel (PBCH), which spans six resource blocks (RBs). Consistent with Berggren's teachings, Wallen confirms that the MIB spans six resource blocks, which is equivalent to 1.4 MHz. Ex.1005, [0060]; Ex.1006, 11. Thus, as would be expected, the MIB in both Wallen and Berggren spans the same bandwidth of 1.4 MHz. Ex.1003, ¶62.

A POSITA would have been motivated for Wallen's LTE system to utilize the LTE standard implementation details taught by Berggren. Ex.1003, ¶63. To the extent any modifications of Wallen are required, any modifications would have involved the combination of prior art elements (broadcasting an MIB, per Wallen, using a PBCH, per Berggren, where the MIB spans 1.4 MHz according to both references) according to known methods (using the pre-existing LTE channel PBCH that already transmits an MIB) to yield the predictable and beneficial result of providing the implementation detail that an MIB is carried in a 1.4 MHz PBCH in order to implement an LTE system. Ex.1003, ¶63. Moreover, a POSITA would have found it beneficial to implement all aspects of the base stations and terminals according to known standards to ensure compatibility, interoperability, and marketability of the product. Ex.1003, ¶63. For example, a POSITA would have found it beneficial and advantageous to implement such devices with standardized techniques that have already been well vetted and tested for workability. Ex.1003,

¶63. Indeed, the combination is nothing more than “the predictable use of prior art elements according to their established functions.” *See KSR Int’l v. Teleflex Inc.*, 550 U.S. 398, 417 (2007). In addition, it would have been obvious to try transmitting the MIB in a PBCH because LTE already provides PBCH (a broadcast channel) for broadcasting the MIB. Ex.1007, [0073]-[0074]; Ex.1003, ¶63.

***c) Reasonable expectation of success***

A POSITA would have had a reasonable expectation of success of transmitting Wallen’s MIB in Berggren’s PBCH because Wallen’s MIB is “broadcast” to “all communication devices,” Ex.1005, [0006]; Ex.1006, 7, a PBCH in LTE transmits broadcast information, such as the MIB, Ex.1007, [0073]-[0074], and both MIB and the PBCH span the same bandwidth, 1.4 MHz, Ex.1005, [0060]; Ex.1006, 11; Ex.1007, [0074]. Ex.1003, ¶64. More generally, a POSITA would expect to be successful implementing standard LTE elements into LTE systems (like Wallen’s) because the very purpose of standardization is to ensure interoperability. Ex.1003, ¶64.

**4. Claim 1**

**[1.0] *A user equipment (UE) comprising:  
a transceiver; and  
a processor, operatively coupled to the transceiver; wherein***

To the extent the preamble is limiting, Wallen discloses or renders obvious limitation [1.0].

Wallen discloses an “MTC device” having “user equipment (UE) circuitry/hardware” that includes “radio circuitry,” which is an example of the claimed “*transceiver*,” and the UE circuitry/hardware is coupled to a “processor,” which is an example of the claimed “*processor*.” Ex.1005, [0083]-[0084] (describing “an exemplary limited bandwidth communication device 1300, such as the MTC device used in the examples described above” having “radio circuitry 1307” and “a processor 1315”); Ex.1006, 12. As illustrated in Figure 13 below, Wallen’s “radio circuitry 1307 [is] coupled to one or more antennas 1309,” and radio circuitry 1307 is part of the “other UE circuitry/hardware components 1305 that enable the...communication device 1301...to operate as a communication device (e.g., to be able to communicate sensor data to a server, and possibly also receive instructions),” Ex.1005, [0083]; Ex.1006, 12. Therefore, radio circuitry 1307 enables communication to and from a UE (e.g., to communicate “data to a server” and also “receive” instructions), demonstrating that “radio circuitry 1307” is an example “*transceiver*.” Wallen discloses that the “processor 1315 [] control[s] the other UE circuitry/hardware components 1305,” which includes “radio circuitry 1307,” thereby disclosing that the processor 1315 (*processor*) and radio circuitry 1307 (*transceiver*) are *operatively coupled*. Ex.1003, ¶66.

The ’670 patent confirms that a “transceiver” is circuitry that enables communication of data to and from another device. Ex.1001, 7:3-6 (“Each of the

base stations 101 comprises a **transceiver unit 103** enabling communication of data to and from a plurality of mobile communication devices via a radio interface.”). The ’670 patent also confirms that Wallen’s MTC device is an example of the claimed *UE*. Ex.1001, 18:34-36 (“**The term MTC terminal as used herein can be replaced with user equipment (UE)...**”); Ex.1003, ¶67.

Wallen’s MTC device (*UE*) having a *transceiver* and *processor* is illustrated in Figure 13 below.

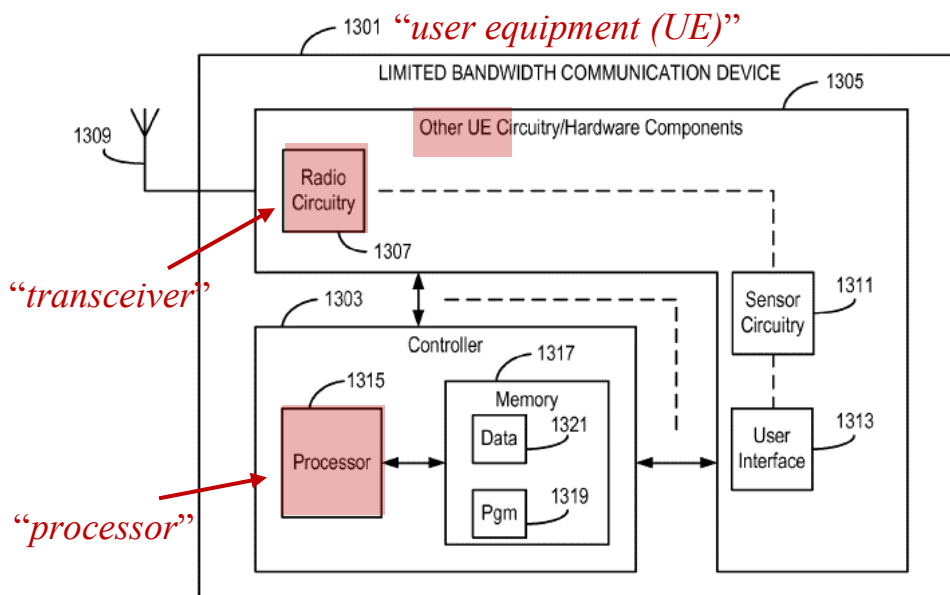


FIG. 13

Ex.1005, Figure 13 (annotated); Ex.1006, Figure 6; Ex.1003, ¶68

Thus, Wallen discloses or renders obvious “*A user equipment (UE)* (“MTC device” having “user equipment (UE) circuitry/hardware”) *comprising: a transceiver* (radio circuitry 1307); *and a processor* (processor 1315), *operatively*

*coupled to the transceiver (radio circuitry 1307).*” Ex.1003, ¶69.

**[1.1] *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),***

Wallen in view of Berggren renders obvious limitation [1.1]. Ex.1003, ¶70.

Wallen’s MTC device (including radio circuitry 1307 (*transceiver*) and a processor 1315 (*processor*)) is configured to receive a *primary synchronization signal (PSS)*, [and] *a secondary synchronization signal (SSS)*. Ex.1005, [0076] (“[T]he **MTC device** regularly performs a cell search...**using** synchronization signals defined by the legacy system (e.g., in an LTE system, **the primary and secondary synchronization signals, ‘PSS’ and ‘SSS’**).”). Ex.1005, [0076]; Ex.1006, 9; Ex.1003, ¶71.

Wallen’s MTC device is also configured to receive the claimed *master information block (MIB)*. Ex.1005, [0077] (“The MTC device then **receives and decodes the MIB...**”); Ex.1006, 10; Ex.1003, ¶72.

Wallen further explains that its processor 1315 “control[s]” the components of the UE to “**carry out any of the MTC device-related aspects**” described in Wallen, such as the receiving functionality described above. Ex.1005, [0084] (Wallen’s MTC device has a memory device storing “a set of processor instructions[] configured to cause the processor 1315 to control the other UE

circuitry/hardware components 1305 so as to carry out any of the MTC device-related aspects described above.”); Ex.1006, 12. The “UE circuitry/hardware components 1305” include “radio circuitry 1307.” Ex.1005, [0083]; Ex.1006, 12. Thus, Wallen discloses that its *transceiver* (radio circuitry 1307) and *processor* (processor 1315) are configured to *receive a primary synchronization signal (PSS), a secondary synchronization signal (SSS)*, (the primary and secondary synchronization signals, ‘PSS’ and ‘SSS’) *and ... a master information block (MIB)* (MIB), as claimed. Ex.1003, ¶73.

Wallen’s MIB is broadcast. Ex.1005, [0006] (“[T]he broadcast information” includes “a Master Information Block (MIB).”); Ex.1006, 7. It would have been obvious for Wallen’s MIB carrying broadcast information to be transmitted in LTE’s physical broadcast channel (PBCH), because the PBCH already transmits MIBs as was standardized in LTE, as discussed in Section X.C.3.b (Reasons to Combine Wallen and Berggren) above. Ex.1003, ¶74. Berggren confirms that the LTE standard specifies that a physical broadcast channel (PBCH) carries the MIB, thereby rendering obvious that Wallen’s MIB carrying broadcast information is carried in a physical broadcast channel (PBCH):

In order to give an understanding of the present disclosure it is first described how the number of primary RBs is communicated in the LTE system....**The downlink**

**system bandwidth is included in the so called master information block (MIB) which ... is transmitted ... on the BCH (Broadcast Channel). The BCH is a transport channel which in turn is mapped to the PBCH (Physical BCH)...**

Ex.1007, [0073]-[0074]; Ex.1003, ¶74. As explained in the Section X.C.3.b above, a POSITA would have been motivated to transmit Wallen's MIB using Berggren's PBCH, which already carries MIBs.

Thus, Wallen's MTC device having a processor 1315 (*processor*) and radio circuitry 1307 (*transceiver*), disclosed as receiving a PSS and a SSS, and an MIB that is broadcast, with Berggren confirming that LTE's broadcast MIB is carried on the PBCH, renders obvious *the transceiver (radio circuitry 1307) and the processor (processor 1315) are configured to receive a primary synchronization signal (PSS), a secondary synchronization signal (SSS), (the primary and secondary synchronization signals, 'PSS' and 'SSS') and a physical broadcast channel (PBCH) including a master information block (MIB) (MIB transmitted on PBCH)*. Ex.1003, ¶75.

**[1.2] *the PSS, SSS and PBCH are in a first bandwidth of a cell having a cell bandwidth,***

Wallen in view of Berggren renders obvious limitation [1.2]. Ex.1003, ¶76.

Wallen discloses that the PSS, SSS, and MIB are transmitted in a 1.4 MHz

bandwidth (“*first bandwidth*”), which is a subset of the cell system bandwidth (“*a cell having a cell bandwidth*”):

The MTC device only needs to support **a subset of the cell system bandwidth...** This is done using **synchronization signals defined by the legacy system (e.g., in an LTE system, the primary and secondary synchronization signals, “PSS” and “SSS”).** Even in a **legacy system, this only requires a system bandwidth of 1.4 MHz**, the signal itself occupying approximately 1 MHz, so the MTC device is fully capable of performing this procedure.

Ex.1005, [0076]; Ex.1006, 9-10; *see also* Ex.1005, [0015] (“While such MTC devices would be able to perform a cell search and **receive a Master Information Block (MIB) on just a 1.4 MHz bandwidth...**”); Ex.1006, 10; Ex.1003, ¶77.

A bandwidth of 1.4 MHz is equivalent to six resource blocks. Ex.1005, [0010] (“[C]ell bandwidth is within the range of about 1.4 ... MHz (6 ... resource blocks (RBs) in LTE terminology.”); Ex.1006, 10. Consistent with Wallen’s teachings that the MIB spans 6 resource blocks (1.4 MHz), Berggren confirms that the MIB is mapped to the PBCH, which uses the “6 central RBs [resource blocks],” or 1.4 MHz, Ex.1007, [0074], an example of the claimed “*first bandwidth*.” Ex.1003, ¶¶77-78.

TABLE 1

| Channel bandwidth<br>[MHz] | Transmission band-<br>width configuration<br>[RBs] |
|----------------------------|----------------------------------------------------|
| 1.4                        | 6                                                  |
| 3                          | 15                                                 |
| 5                          | 25                                                 |
| 10                         | 50                                                 |
| 15                         | 75                                                 |
| 20                         | 100                                                |

Ex.1007, Table 1 (annotated); Ex.1003, ¶78

Wallen’s wireless cellular system bandwidth (“*cell bandwidth*”) may be up to 20 MHz. Ex.1005, [0012] (“**Examples of cellular system parameters ... are the system bandwidth...** Using LTE as defined according to current standardization releases requires that a device support **a system bandwidth that is up to 20 MHz.**”); Ex.1006, 8; Ex.1003, ¶79. The cellular bandwidth is used by one or more cells (*a cell*) in the system. Ex.1005, [0080] (“[T]he MTC device regularly performs a **cell search in order to find a suitable cell** to camp on/connect to (step 1101). This is done using synchronization signals defined by the legacy system (e.g., in an LTE system, the primary and secondary synchronization signals, ‘PSS’ and ‘SSS’).”); Ex.1006, 11; Ex.1003, ¶79.

Thus, Wallen discloses that the *PSS* and *SSS* (PSS and SSS) and MIB are transmitted in *a first bandwidth of a cell having a cell bandwidth* (a subset of the system bandwidth used by one or more cells), and Berggren confirms that the MIB

is transmitted in a “*PBCH*” (PBCH) spanning the same bandwidth as the *PSS* and *SSS* (*PSS* and *SSS*), thereby rendering obvious that “*the PSS, SSS and PBCH are in a first bandwidth of a cell having a cell bandwidth.*” Ex.1003, ¶80.

**[1.3] *wherein the first bandwidth is a first portion of the cell bandwidth,***

Wallen discloses or renders obvious limitation [1.3]. Ex.1003, ¶81.

As discussed in the analysis of limitation [1.2], Wallen discloses that the *PSS*, *SSS*, and *MIB* are transmitted in a 1.4 MHz bandwidth (“*first bandwidth*”), which is a “subset [*a first portion*] of the cell system bandwidth [*of the cell bandwidth*]” that spans up to 20 MHz, Ex.1005, [0076], [0012]; Ex.1006, 9-10, thereby disclosing or rendering obvious limitation [1.3]. Ex.1003, ¶82.

**[1.4] *wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information; and***

Wallen discloses or renders obvious limitation [1.4]. Ex.1003, ¶83.

Wallen discloses that *the MIB* (the *MIB*) *includes an indication of frequency resources and time resources* (indicates the frequency/time location of resource blocks) *for use in acquiring additional system information* (where an MTC device can find control information that in turn points to *SIBs*):

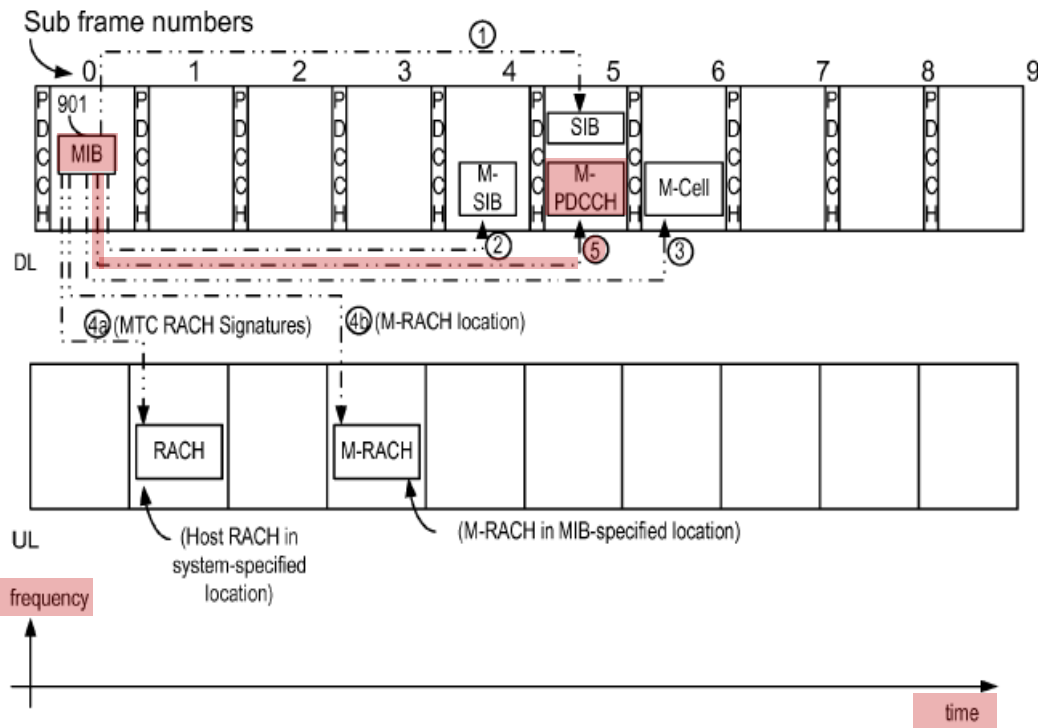
In another aspect (represented by the number ‘5’ enclosed in a circle), **the MIB 901 indicates the resource blocks, reference signal sequence, or search space allocated to a specific M-PDCCH**, which should occupy regions of the

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.**

Ex.1005, [0072]; Ex.1006, 9. Thus, the MIB “indicates the...resource blocks allocated to a specific M-PDCCH.” Ex.1005, [0072]; Ex.1006, 9. A “resource block” is a term of art in the context of LTE standards that refers to a unit of time and frequency resources in a time-frequency grid. Ex.1003, ¶84 (citing Ex.1008, [0042] (“A Resource Block (RB) is the unit of resource allocation, and it includes a plurality of consecutive subcarriers in one slot.”), [0047] (“[O]ne resource block is ...7 OFDM symbols in the time domain and 12 subcarriers in the frequency domain.”)).

Consistent with this understanding, Wallen describes the MIB generally as “conveying ... **time- and/or frequency-wise locations of resource blocks,**” Ex.1005, [0065]; Ex.1006, 9; *see also* Ex.1005, [0077]; Ex.1006, 10. Thus, 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*, as further illustrated in Figure 9. Ex.1003, ¶84.

MIB points out time/frequency location  
of M-PDCCH, which in turn points to SIBs



Ex.1005, Figure 9 (annotated); Ex.1006, Figure 1; Ex.1003, ¶84

These resource blocks of the M-PDCCH include “control information” that includes “downlink assignments pointing to the SIBs.” Ex.1005, [0072]; Ex.1006, 9. Therefore, 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*). Ex.1003, ¶85.

In summary, Wallen discloses or renders obvious that *the MIB* (the MIB) *includes an indication of frequency resources and time resources* (indicates

frequency and time locations of resource blocks) *for use in acquiring additional system information* (for use in acquiring system information blocks/SIBs), as recited in limitation [1.4]. Ex.1003, ¶86.<sup>4</sup>

**[1.5] *the transceiver and the processor are configured to acquire the additional system information using the indication of the frequency resources and the time resources,***

Wallen discloses or renders obvious limitation [1.5]. Ex.1003, ¶87.

Wallen discloses that its *UE* (MTC device) includes a *processor* (processor 1315) and *transceiver* (radio circuitry 1307) that provide the functionality described in the previous claim elements. Ex.1005, [0084] (“The memory device(s) store program means 1319 (e.g., a set of processor instructions) configured to

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<sup>4</sup> 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.

cause the processor 1315 to control the other UE circuitry/hardware components 1305 [including radio circuitry 1307] so as to carry out any of the MTC device-related aspects described above.”), Figure 13; Ex.1006, 12, Figure 6; Ex.1003, ¶88.

As further discussed in the analysis of limitation [1.4], Wallen’s *transceiver* and *processor* (MTC device, having radio circuitry 1307 and a processor 1315, Ex.1005, [0083]-[0084]; Ex.1006, 12), *are configured to acquire the additional system information* (are configured to cause the processor 1315 to control radio circuitry 1307 to receive SIBs) *using the indication of the frequency resources and the time resources* (using the indicated resource blocks having control information that includes “downlink assignments pointing to the SIBs,” Ex.1005, [0072]; Ex.1006, 9), thereby disclosing or rendering obvious limitation [1.5]. Ex.1003, ¶89.

**[1.6] wherein the indicated frequency resources and the time resources include control information for use by the UE to acquire a system information block 1.**

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.

MIB indicates the time/frequency location of M-PDCCH,  
which in turn has “control information” such as downlink  
assignments pointing to SIBs (not shown)

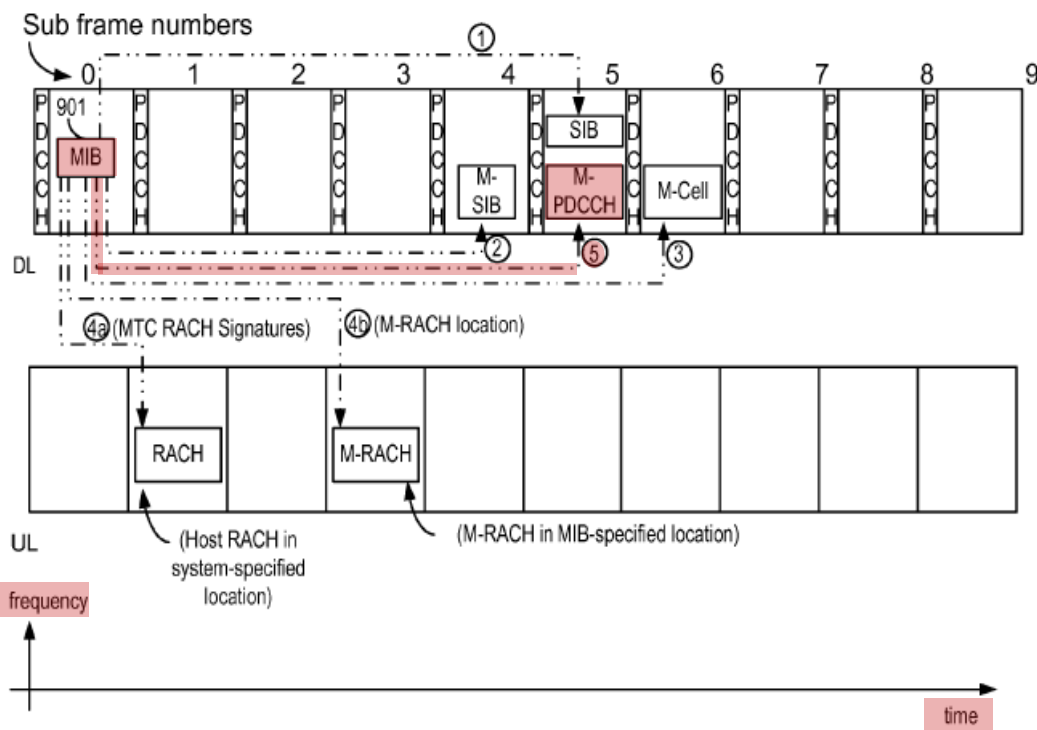


FIG. 9

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.<sup>5</sup>

## 5. Claim 2

### *The UE of claim 1*

**[2.1] wherein the indication of the frequency resources and the time resources is within a first portion of the cell bandwidth.**

Wallen discloses or renders obvious limitation [2.1]. Ex.1003, ¶93.

As shown in the analysis of limitation [1.0], Wallen’s MTC device is an example of *the UE*. Moreover, MTC devices receive signals in only a “subset,” or portion, of the cell system bandwidth by design. Ex.1005, [0076] (“The MTC device only needs to support a subset of the cell system bandwidth.”); Ex.1006, 10; *see also* Ex.1005, [0042] (“[A]n MTC device[] is capable of receiving a signal no larger than a second bandwidth, wherein the second bandwidth is smaller than the first bandwidth,” which is “a full bandwidth of the cellular communication system.”); Ex.1006, 9. Thus, all transmissions to the MTC device, including the examples presented in the analysis of limitation [1.4] of the “*indication*,” exist in a bandwidth that is smaller than the cell system bandwidth, an example of “*a first*

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<sup>5</sup> Note that Wallen presents an embodiment that discloses or renders obvious limitation [1.6] under Patent Owner’s apparent understanding that an MIB that points directly to SIB1 satisfies limitation [1.6]. *See* Footnote 4; Ex.1003, ¶92.

*portion of the cell bandwidth.” Ex.1003, ¶94.*

## 6. Claim 3

### *The UE of claim 1*

**[3.1] wherein the transceiver and the processor are configured to receive control information and physical downlink shared channel (PDSCH) transmissions with the first portion of the cell bandwidth and not in other portions of the cell bandwidth.**

Wallen discloses or renders obvious limitation [3.1]. Ex.1003, ¶95.

**First**, Wallen discloses that its MTC device (*UE*) is configured to receive *transmissions with the first portion of the cell bandwidth and not in other portions of the cell bandwidth*. Wallen discloses an MTC device that “only needs to support a subset of the cell system bandwidth.” Ex.1005, [0076]; Ex.1006, 8. MTC devices are “**capable of receiving a signal no larger than a second bandwidth,**” which is “**smaller than**” “**a full bandwidth of the cellular communication system,**” Ex.1005, [0042], Ex.1006, 8-9. Thus, information is received by an MTC device only on this smaller, or reduced, bandwidth (receiving *transmissions with the first portion of the cell bandwidth and not in other portions of the cell bandwidth* (the MTC device is not capable of receiving a signal outside of the subset or second bandwidth of the full cellular system bandwidth). Ex.1003, ¶96.

**Second**, Wallen discloses that its transmissions include *control information and physical downlink shared channel (PDSCH) transmissions*. Wallen

acknowledges that legacy LTE devices communicate using physical downlink control channel (PDCCH) and PDSCH channels. Ex.1005, [0015] (discussing legacy LTE devices being able to “decode PDCCH and PDSCH.”); Ex.1006, 8. The PDSCH was known to transmit data. Ex.1005, [0013] (“In LTE systems, the PDCCH points out data in the PDSCH that is included in the same subframe as the PDCCH.”); Ex.1006, 8; Ex.1003, ¶97.

More generally, the PDCCH and PDSCH channels were known to be a typical part of communication in LTE for control information and data, respectively. Ex.1003, ¶98 (citing Ex.1008, [0049] (describing an LTE “downlink sub-frame” with a “data region to which Physical Downlink Shared Channels (PDSCHs) are allocated” and a “control region” including “[d]ownlink control channels” including “a Physical Downlink Control Channel (PDCCH)”).

In addition, Wallen presents an example in which the MIB indicates the “resource blocks” allocated to an “M-PDCCH” (PDCCH for an MTC device), where the “M-PDCCH supplies **control information** to the MTC device.” Ex.1005, [0072]; Ex.1006, 9. Thus, M-PDCCH transmissions received on *the first portion of the cell bandwidth* (subset of cell system bandwidth) include *control information* (control information). Ex.1003, ¶99. Wallen additionally discloses that the “M-PDCCH may comply with the legacy PDCCH format for the MTC device's lower bandwidth.” Ex.1005, [0072]; Ex.1006, 9. Because the legacy PDCCH

format “points out data in the PDSCH that is included in the same subframe as the PDCCH,” it would have been understood or obvious that the M-PDCCH, having a “legacy PDCCH format,” also points to a PDSCH for data for MTC devices.

Ex.1003, ¶99.

**Third**, Wallen discloses that its *UE* (MTC device) includes a *processor* (processor 1315) and *transceiver* (radio circuitry 1307) that provide the functionality described limitation [3.1]. Ex.1005, [0084] (“The memory device(s) store program means 1319 (e.g., a set of processor instructions) configured to **cause the processor 1315 to control the other UE circuitry/hardware components 1305 [including radio circuitry 1307] so as to carry out any of the MTC device-related aspects described above.**”), Figure 13; Ex.1006, 12, Figure 6; Ex.1003, ¶100.

In summary, Wallen discloses a *UE* (MTC device) whose *transceiver* (radio circuitry 1307) and *processor* (processor 1315) *are configured to receive control information* (control information in M-PDCCH) *and PDSCH transmissions* (M-PDCCH having a legacy PDCCH format was known to point to PDSCH transmissions) *with the first portion of the cell bandwidth and not in other portions of the cell bandwidth* (MTC devices are “capable of receiving a signal no larger than a second bandwidth,” which is “smaller than” “a full bandwidth of the cellular communication system” so all transmissions are in the second bandwidth).

Ex.1003, ¶101.

## 7. Claim 4

### 4. The UE of claim 2

***[4.1] wherein the transceiver and the processor are configured to receive control information indicating a plurality of bandwidth portions of the cell bandwidth, wherein the plurality of bandwidth portions includes the first portion.***

Wallen discloses or renders obvious limitation [4.1]. Ex.1003, ¶102.

Wallen's M-PDCCH that includes downlink assignments for multiple SIBs renders obvious "*control information indicating a plurality of bandwidth portions of the cell bandwidth*" for the following reasons. Ex.1003, ¶103.

As explained in the analysis of limitation [1.6], Wallen discloses an MIB that "indicates the resource blocks" (time and frequency locations) "allocated to a specific M-PDCCH," which is where an MTC can obtain "control information" (*control information* of limitation [1.6] as claimed) that includes "downlink assignments pointing to the SIBs," which are time and frequency resources that point to SIBs. Ex.1003, ¶104.

For example, Wallen states:

In another aspect (represented by the number '5' enclosed in a circle), **the MIB 901 indicates the resource blocks ... allocated to a specific M-PDCCH...** 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.

Ex.1005, [0072]; Ex.1006, 9. Each resource block, or collection of resource blocks used together, represents a “bandwidth portion” of the available frequency spectrum. Ex.1003, ¶104. For example, Wallen references six resource blocks, which is equal to 1.4 MHz of bandwidth. Ex.1005, [0010]; Ex.1006, 10; Ex.1003, ¶104.

Wallen’s disclosure of an MIB that “indicates the resource blocks...allocated to a specific M-PDCCH,” which “supplies control information ... including... downlink assignments pointing to the SIBs that are intended for this MTC device,” Ex.1005, [0072]; Ex.1006, 9, renders obvious “*control information indicating a plurality of bandwidth portions of the cell bandwidth.*” Indicating the resource blocks corresponding to multiple “SIBs,” is an example of “*a plurality of bandwidth portions of the cell bandwidth.*” A downlink assignment in the “control information” corresponding to a single SIB is an indication of the resource blocks (which are units of time and frequency) allocated to the SIB such that the UE knows where in time and frequency to receive the SIB. It would have been obvious to a POSITA that multiple of these assignments correspond to multiple “*bandwidth portions.*” The resource blocks are within the “*cell bandwidth*” because that is the bandwidth being used for all communication in a cell. Ex.1003, ¶105.

The LTE standards specify numerous types of SIBs (at least 13), including

SIB1, SIB2, up to SIB13. Ex.1003, ¶106 (citing Ex.1009, 2, lines 34-36 and 3, lines 2-18, and Ex.1007 [0075]). Ex.1003, ¶106. The MIB illustrated in Wallen's Figure 9 points to different frequency segments (bandwidth portions) for various illustrated examples, confirming that the communication system has the flexibility to use different bandwidth portions for different transmissions to an MTC device. Ex.1003, ¶¶107-108.

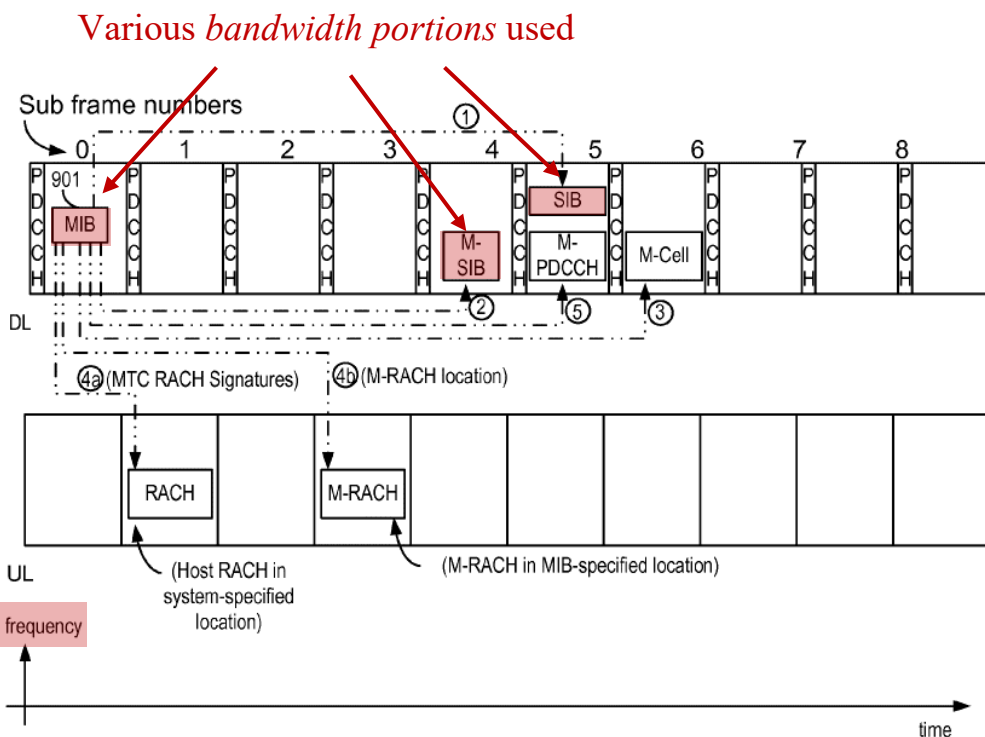


FIG. 9

Ex.1005, Figure 9 (annotated); Ex.1006, Figure 1; Ex.1003, ¶108

As discussed in the analysis of limitation [1.3], Wallen discloses that the PSS, SSS, and MIB are transmitted in a 1.4 MHz bandwidth (*“first bandwidth”*), which is a “subset [*a first portion*] of the cell system bandwidth [*of the cell*]

*bandwidth]*” that spans up to 20 MHz. Ex.1005, [0076], [0012]; Ex.1006, 9-10. As discussed in the analysis of limitation [1.2], a 1.4 MHz bandwidth spans six resource blocks. Ex.1005, [0010] (“[C]ell bandwidth is within the range of about 1.4 ... MHz (6 ... resource blocks (RBs) in LTE terminology).”); Ex.1006, 10. It would have been obvious that 1.4 MHz, corresponding to six resource blocks, of the available bandwidth (*the first portion*) may be included in the downlink assignments in Wallen’s M-PDCCH. Ex.1003, ¶109. Six resource blocks are used by the MIB at a certain time, but then these resource blocks are available for other types of transmissions, such as the disclosed M-PDCCH in Wallen, as well as SIB1, SIB2, etc. at other times. Ex.1003, ¶109.

Finally, regarding the *transceiver* and *processor* aspects of limitation [4.1], as discussed in the analysis of limitations [1.1] and [3.1], Wallen’s processor 1315 (*processor*) is configured to control the other UE circuitry and hardware, such as radio circuitry 1307 (*transceiver*), to carry out any of the MTC device (*UE*) functionality. Ex.1003, ¶110.

Thus, Wallen discloses a *UE* (MTC device) having a *transceiver* (radio circuitry 1307) and *processor* (processor 1315) *configured to receive control information* (control information in an M-PDCCH) *indicating a plurality of bandwidth portions* (downlink assignments pointing to SIBs) *of the cell bandwidth* (cellular system bandwidth up to 20 MHz), *wherein the plurality of bandwidth*

*portions includes the first portion* (wherein the downlink assignments can use any of the six resource blocks, or 1.4 MHz, at a given time, just as six resource blocks were used for the MIB at a particular time), thereby disclosing or rendering obvious limitation [4.1]. Ex.1003, ¶111.

## **8. Claim 5**

### **5. The UE of claim 4**

**[5.1] wherein the transceiver and the processor are configured to switch between the plurality of bandwidth portions at different times.**

Wallen discloses or renders obvious limitation [5.1]. Ex.1003, ¶112.

As explained in the analysis of limitation [4.1], Wallen describes a scenario in which an M-PDCCH indicates “downlink assignments pointing to the SIBs.” Ex.1005, [0072]; Ex.1006, 9. It would have been obvious or understood that “downlink assignments” for “SIBs” refers to frequency resources (*bandwidth portions*) (and time resources) where different SIBs are located. Ex.1003, ¶113. For example, Wallen’s Figure 10 illustrates the MIB pointing out the frequency/time (“Freq/Time”) resources for receiving SIB information (denoted in Figure 10 as “Freq/Time Position for SIB” 1003). Ex.1005, Figure 10; Ex.1006, Figure 3. Figure 10 is a flowchart that illustrates “any of the embodiments depicted in Figure 9.” Ex.1005, [0075]; Ex.1006, 10; Ex.1003, ¶113.

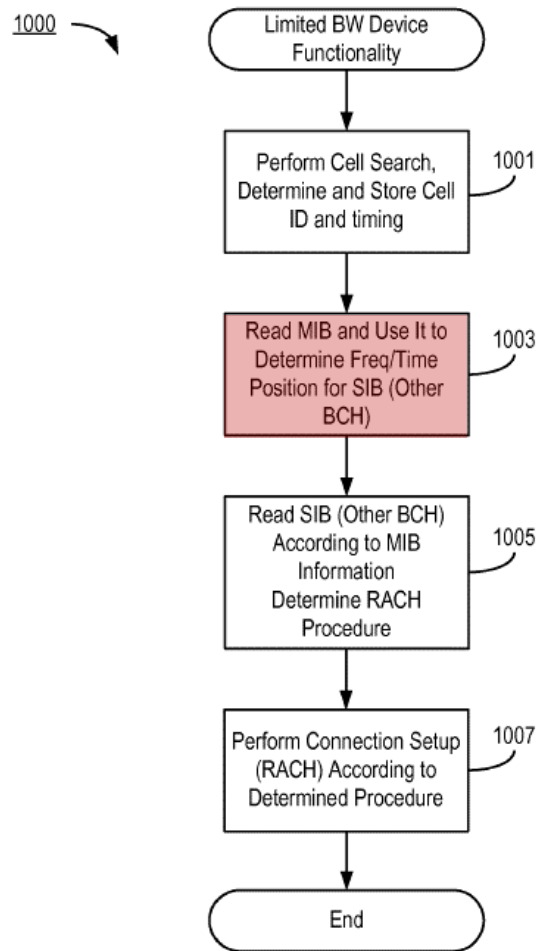


FIG. 10

Ex.1005, Figure 10 (annotated); Ex.1006, Figure 3; Ex.1003, ¶113

In addition, as discussed in the analysis of limitation [4.1], it would have been understood or obvious that Wallen’s teaching of “downlink assignments pointing to SIBs,” referring to frequency (and time) locations, are in the form of an assignment of resource blocks where SIBs are located. It would have been obvious that one option (among many) is for SIB1 to be indicated as appearing in one or more resource blocks at one time and SIB2 to be indicated as appearing in one or

more different RBs at a different time (that may also be at different frequencies), thereby rendering obvious that a UE switches between different bandwidth portions (e.g., resource blocks allocated to respective SIBs) at different times (*“switch between the plurality of bandwidth portions at different times.”*). Ex.1003, ¶114.

The MIB illustrated in Wallen’s Figure 9 below points to different frequency resources (*bandwidth portions*) being used at *different times* for various illustrated examples, further demonstrating that the MTC device (UE) *switch[es] between the plurality of bandwidth portions at different times*. Ex.1003, ¶115.

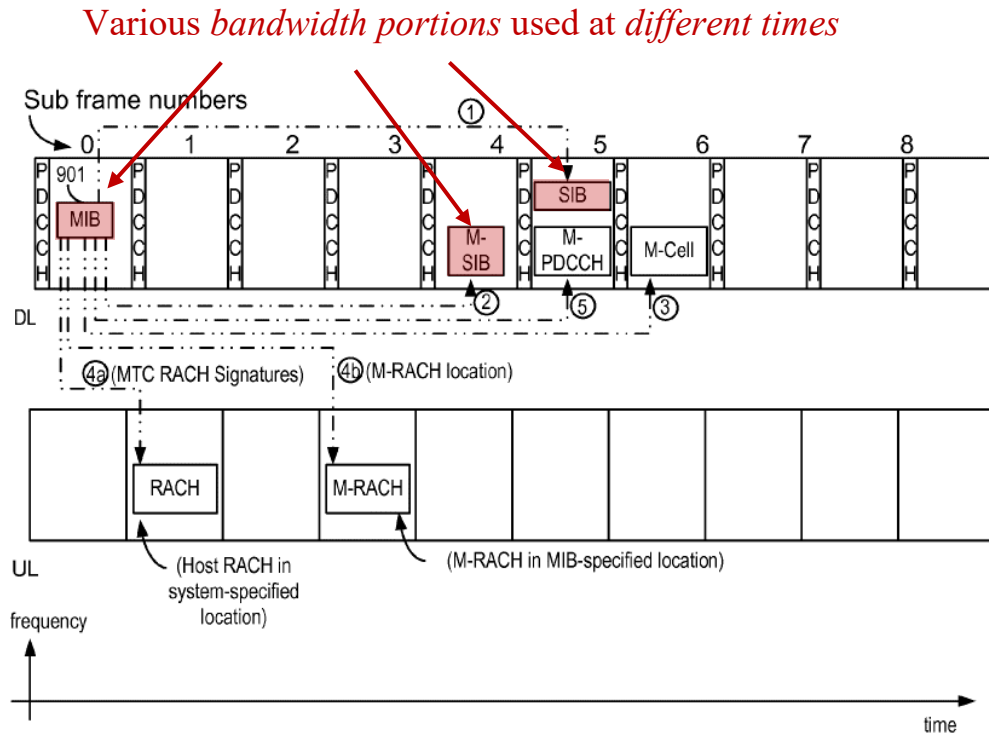


FIG. 9

Ex.1005, Figure 9 (annotated); Wallen-Prov, Figure 1; Ex.1003, ¶115

Finally, regarding the *transceiver* and *processor* aspects of limitation [5.1], as discussed in the analysis of limitations [1.1] and [3.1], Wallen's processor 1315 (*processor*) is configured to control the other UE circuitry and hardware, such as radio circuitry 1307 (*transceiver*), to carry out any of the MTC device (*UE*) functionality. Ex.1003, ¶116.

Thus, Wallen discloses *the UE* (MTC device) *wherein the transceiver* (radio circuitry 1307) and *the processor* (processor 1315) *are configured to switch between the plurality of bandwidth portions at different times*. Ex.1003, ¶117.

9. Claim 6

*The UE of claim 1,  
[6.1] wherein the indicated frequency resources and the time resources include a second MIB.*

Wallen discloses or renders obvious limitation [6.1]. Ex.1003, ¶118.

Wallen discloses or at least renders obvious that its MIB (*MIB* of claim 1) includes “time/frequency information” (*the indicated frequency resources and the time resources*) that indicate “positions of an M-MIB” (*include a second MIB*):

**[T]he MIB 901 includes time/frequency information ... that informs the MTC device of a location of the resource blocks and/or MCS allocated to a specific M-cell. Armed with this information, the MTC device is then able to determine (e.g., via standardization) positions of an M-MIB and/or M-SIB(s) associated with the M-cell.**

Ex.1005, [0070]; Ex.1006, 9. The “resource blocks ... allocated to an M-cell” include the M-MIB because the “M-MIB [is] ... associated with the M-cell.”

Ex.1005, [0070]; Ex.1006, 9; Ex.1003, ¶119.<sup>6</sup> Thus, Wallen discloses or at least

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<sup>6</sup> The “M” prefix for “M-cell” and “M-MIB” signify a cell and an MIB, respectively, specifically for MTC devices. Ex.1005, [0043]; Ex.1006, 9.

renders obvious that *the indicated frequency resources and the time resources* (“time/frequency information” in the MIB) *includes a second MIB* (“of resource blocks ...allocated to a specific M-cell” that includes an “M-MIB ...associated with the M-cell”). Ex.1003, ¶119.

## 10. Claim 7

**[7.0] *A method performed by a user equipment (UE), the method comprising:***

As explained in the analysis of limitation [1.0], Wallen discloses a “communication device” having “user equipment (UE) circuitry/hardware” that includes “radio circuitry,” which is an example of *user equipment (UE)*. Various actions/steps are discussed below as being performed by Wallen’s communication device, therefore disclosing a “*method*” performed by a UE. Thus, Wallen discloses limitation [7.0]. Ex.1003, ¶120.

**[7.1] *receiving a primary synchronization signal (PSS), a secondary synchronization signal (SSS), and a physical broadcast channel (PBCH) including a master information block (MIB),***

Limitation [7.1] is an action performed by “*the transceiver and the processor*” of Wallen’s device, as discussed in the analysis of limitation [1.1].

Other than specifying that the “*receive*” function is performed by “*the transceiver and the processor*” in limitation [1.1], the remainder of limitation [1.1] is identical to limitation [7.1]. Thus, Wallen combined with Berggren renders obvious limitation [7.1] for the same reasons as [1.1]. Ex.1003, ¶121.

**[7.2] *the PSS, SSS and PBCH are in a first bandwidth of a cell having a cell bandwidth,***

Limitation [7.2] is identical to limitation [1.2]. Therefore, Wallen combined with Berggren renders obvious limitation [7.2] for the same reasons given in the analysis of [1.2]. Ex.1003, ¶122.

**[7.3] *wherein the first bandwidth is a first portion of the cell bandwidth,***

Limitation [7.3] is identical to limitation [1.3]. Therefore, Wallen discloses or renders obvious limitation [7.3] for the same reasons given in the analysis of [1.3]. Ex.1003, ¶123.

**[7.4] *wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information; and***

Limitation [7.4] is identical to limitation [1.4]. Therefore, Wallen discloses or renders obvious limitation [7.4] for the same reasons given in the analysis of [1.4]. Ex.1003, ¶124.

**[7.5] *acquiring the additional system information using the indication of the frequency resources and the time resources,***

Other than specifying that the “*acquire*” function is performed by “*the transceiver and the processor*” in limitation [1.5], the remainder of limitation [1.5] is identical to limitation [7.5]. Thus, Wallen discloses or renders obvious limitation [7.5] for the same reasons as [1.5]. Ex.1003, ¶125.

**[7.6] *wherein the indicated frequency resources and the time resources include control information for use by the UE to acquire a system information block 1.***

Limitation [7.6] is identical to limitation [1.6]. Therefore, Wallen discloses or renders obvious limitation [7.6] for the same reasons given in the analysis of [1.6]. Ex.1003, ¶126.

## **11. Claim 8**

### **8. The method of claim 7**

**[8.1] wherein the indication of the frequency resources and the time resources is within a first portion of the cell bandwidth.**

Limitation [8.1] is identical to limitation [2.1]. Therefore, Wallen discloses or renders obvious limitation [8.1] for the same reasons given in the analysis of [2.1]. Ex.1003, ¶127.

## **12. Claim 9**

### **9. The method of claim 7, further comprising:**

**[9.1] receiving control information and physical downlink shared channel (PDSCH) transmissions with the first portion of the cell bandwidth and not in other portions of the cell bandwidth.**

Other than specifying that the “receive” function is performed by “the transceiver and the processor” in limitation [3.1], the remainder of limitation [3.1] is identical to limitation [9.1]. Thus, Wallen discloses or render obvious limitation [9.1] for the same reasons as [3.1]. Ex.1003, ¶128.

## **13. Claim 10**

### **10. The method of claim 8, further comprising:**

**[10.1] receiving control information indicating a plurality of bandwidth portions of the cell bandwidth, wherein the plurality of bandwidth portions includes the first portion.**

Other than specifying that the “*receive*” function is performed by “*the transceiver and the processor*” in limitation [4.1], the remainder of limitation [10.1] is identical to limitation [4.1]. Thus, Wallen discloses or renders obvious limitation [10.1] for the same reasons as presented in [4.1]. Ex.1003, ¶129.

#### **14. Claim 11**

**11. *The method of claim 10, further comprising:  
[11.1] switching between the plurality of bandwidth portions at different times.***

Other than specifying that the “*switch*” function is performed by “*the transceiver and the processor*” in limitation [5.1], the remainder of limitation [11.1] is identical to limitation [5.1]. Thus, Wallen discloses or renders obvious limitation [11.1] for the same reasons as presented in [5.1]. Ex.1003, ¶130.

#### **15. Claim 12**

***The method of claim 7  
[12.1] wherein the indicated frequency resources and the time resources include a second MIB.***

Claim element [12.1] is identical to claim element [6.1]. Therefore, Wallen discloses or renders obvious claim element [12.1] for the same reasons given in the analysis of [6.1]. Ex.1003, ¶131.

#### **16. Claim 13**

***[13.0] At least one non-transient computer readable medium containing program instructions to perform a method of:***

Wallen discloses limitation [13.0]. Wallen discloses a memory (*non-*

*transient computer readable medium*) that stores “a set of processor instructions[] configured to cause the processor 1315 to control the other UE circuitry/hardware components 1305 so as to carry out any of the MTC device-related aspects described above,” Ex.1005, [0084], Ex.1006, 12, which discloses or renders obvious limitation [13.0]. Ex.1003, ¶132.

**[13.1] *receiving a primary synchronization signal (PSS), a secondary synchronization signal (SSS), and a physical broadcast channel (PBCH) including a master information block (MIB),***

Limitation [13.1] is identical to limitation [7.1]. Therefore, Wallen combined with Berggren renders obvious limitation [13.1] for the same reasons given in the analysis of [7.1]. Ex.1003, ¶133.

**[13.2] *the PSS, SSS and PBCH are in a first bandwidth of a cell having a cell bandwidth,***

Limitation [13.2] is identical to limitation [7.2]. Therefore, Wallen combined with Berggren renders obvious limitation [13.2] for the same reasons given in the analysis of [7.2]. Ex.1003, ¶134.

**[13.3] *wherein the first bandwidth is a first portion of the cell bandwidth,***

Limitation [13.3] is identical to limitation [7.3]. Therefore, Wallen discloses or renders obvious limitation [13.3] for the same reasons given in the analysis of [7.3]. Ex.1003, ¶135.

**[13.4] *wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information; and***

Limitation [13.4] is identical to limitation [7.4]. Therefore, Wallen discloses or renders obvious limitation [13.4] for the same reasons given in the analysis of [7.4]. Ex.1003, ¶136.

***[13.5] acquiring the additional system information using the indication of the frequency resources and the time resources,***

Limitation [13.5] is identical to limitation [7.5]. Therefore, Wallen discloses or renders obvious limitation [13.5] for the same reasons given in the analysis of [7.5]. Ex.1003, ¶137.

***[13.6] wherein the indicated frequency resources and the time resources include control information for use by the UE to acquire a system information block 1.***

Limitation [13.6] is identical to limitation [7.6]. Therefore, Wallen discloses or renders obvious limitation [13.6] for the same reasons given in the analysis of [7.6]. Ex.1003, ¶138.

## **17. Claim 14**

***The at least one non-transient computer readable medium of claim 13 wherein [14.1] the indication of the frequency resources and the time resources is within a first portion of the cell bandwidth.***

Limitation [14.1] is identical to limitation [8.1]. Therefore, Wallen discloses or renders obvious limitation [14.1] for the same reasons given in the analysis of [8.1]. Ex.1003, ¶139.

**18. Claim 15**

***15. The at least one non-transient computer readable medium of claim 13, further comprising:***

***[15.1] receiving control information and physical downlink shared channel (PDSCH) transmissions with the first portion of the cell bandwidth and not in other portions of the cell bandwidth.***

Limitation [15.1] is identical to limitation [9.1]. Therefore, Wallen discloses or renders obvious limitation [15.1] for the same reasons given in the analysis of [9.1]. Ex.1003, ¶140.

**19. Claim 16**

***16. The at least one non-transient computer readable medium of claim 14, further comprising:***

***[16.1] receiving control information indicating a plurality of bandwidth portions of the cell bandwidth, wherein the plurality of bandwidth portions includes the first portion.***

Limitation [16.1] is identical to limitation [10.1]. Therefore, Wallen discloses or renders obvious limitation [16.1] for the same reasons given in the analysis of [10.1]. Ex.1003, ¶141.

**20. Claim 17**

***17. The at least one non-transient computer readable medium of claim 16, further comprising:***

***[17.1] switching between the plurality of bandwidth portions at different times.***

Limitation [17.1] is identical to limitation [11.1]. Therefore, Wallen discloses or renders obvious limitation [17.1] for the same reasons given in the

analysis of [11.1]. Ex.1003, ¶142.

## **21. Claim 18**

**18. *The at least one non-transient computer readable medium of claim 13 [18.1] wherein the indicated frequency resources and the time resources include a second MIB.***

Limitation [18.1] is identical to limitation [6.1]. Therefore, Wallen discloses or renders obvious limitation [18.1] for the same reasons given in the analysis of [6.1]. Ex.1003, ¶143.

## **XI. DISCRETIONARY DENIAL IS INAPPROPRIATE**

### **A. No basis for § 325(d) denial**

The Grounds presented in this Petition have not previously been presented to the Office with respect to the Challenged Claims of the '670 patent. Although Wallen is listed on the face of the '670 patent, it was not relied upon during prosecution to reject the pending claims. Wallen was submitted in an Information Disclosure Statement (IDS) along with over 50 other references, *see* Ex.1002, 76-84, but there is no Examiner signature on the IDS, *see id.*, 82. Moreover, there is no evidence that the Examiner substantively considered Wallen with respect to the Challenged Claims. To the extent the Examiner considered Wallen with respect to the Challenged Claims, it was material error for the Examiner to have allowed the Challenged Claims for the reasons presented in the Grounds above. *Advanced*

*Bionics, LLC v. Med-El Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 8 (Feb. 13, 2020) (precedential).

**B. No basis for *Fintiv* denial**

The Board balances six factors in considering denial under § 314. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (Mar. 20, 2020) (precedential). These factors strongly favor institution. The district court case is in its very early stages. Patent Owner filed its complaint on April 12, 2024 (Ex.1014) and trial is not scheduled to start until May 14, 2026. Ex.1015 (scheduling order). Petitioner has worked diligently to prepare this Petition, which is being filed well within the one-year timeframe allowed by Congress.

**1. No evidence regarding a stay**

No motion to stay has been filed, so the Board should not infer the outcome of such a motion. *Sand Revolution II, LLC v. Continental Intermodal Group – Trucking LLC*, IPR2019-01393, Paper 24 at 7 (June 16, 2020) (informative). Thus, this factor is neutral on discretionary denial.

## **2. Parallel proceeding trial date**

This factor weighs against discretionary denial because the projected trial date—based on median time-to-trial statistics—is in January of 2027<sup>7</sup>, which is well after the projected date for the Board to issue a Final Written Decision in May 2026. While trial is currently proposed<sup>8</sup> for May 14, 2026 (Ex.1015, 4), the Board recognizes “that scheduled trial dates are unreliable and often change.” *See* Director’s Memorandum on Discretionary Denials. Ex.1017, 8. Moreover, Petitioner notes that “a court’s general ability to set a fast-paced schedule is not particularly relevant... where, like here, the forum itself has not historically resolved cases so quickly.” *In re Apple Inc.*, 979 F.3d 1332, 1344 (Fed. Cir. 2020). Thus, concerns over potentially conflicting decisions is minimal. As such, this factor heavily weighs against discretionary denial.

## **3. Investment in the parallel proceeding**

The investment in the co-pending litigation has been minimal. A claim construction hearing has not yet occurred, fact discovery is not proposed to open

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<sup>7</sup> The current average time-to-trial for the district court hearing the co-pending litigation is 32.7 months. *See* Ex.1016, 5.

<sup>8</sup> The district court has not entered an order scheduling a trial date.

until April 11, 2025, and expert discovery is not proposed to open until November 20, 2025. Ex.1015, 2-3; *see PEAG LLC v. Varta Microbattery GmbH*, IPR2020-01214, Paper 8 at 17 (Jan. 6, 2021). This lack of investment favors institution.

Moreover, Petitioner only learned which claims were being asserted in August 2024. *See* Ex.1020 (infringement contentions cover pleading). Since then, Petitioner has worked expeditiously to file this petition within four months. And, as of this filing, Patent Owner has not yet served its final infringement contentions. Under *Fintiv*, Petitioner’s prompt filing “weigh[s] against exercising the authority to deny institution.” *Fintiv*, Paper 11 at 11.

#### **4. Overlapping issues with the parallel proceeding**

Petitioner served its preliminary invalidity contentions on October 24, 2024. However, Petitioner will not be serving its final invalidity contentions until May 22, 2025, well after the Board would issue an institution decision in this case. Ex.1015, 3. Accordingly, the extent of overlap is thus speculative at this point in time.

#### **5. Petitioner is a defendant**

Petitioner is a defendant in the co-pending litigation. That is true of most Petitioners in IPR proceedings, making this factor neutral. *See HP Inc. v. Slingshot Printing LLC*, IPR2020-01084, Paper 13 at 9 (Jan. 14, 2021).

**6. Other circumstances**

“[T]he PTAB will not deny institution of an IPR or PGR under *Fintiv* (i) when a petition presents compelling evidence of unpatentability.” Ex.1017, 9. Here, the petition—along with Dr. Ding’s expert testimony—plainly shows that the ’670 patent claims no more than well-known subject matter.

Because the *Fintiv* factors are either neutral or weigh against discretionary denial, institution should not be denied on discretionary factors.

**C. No basis for *General Plastic* denial**

The ’670 patent has not been challenged in any prior IPR petition, so *General Plastic* discretionary institution does not apply to this Petition. *See General Plastic Indus. Co., Ltd. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19 at 16 (Sept. 6, 2016) (Section II.B.4.i. precedential).

**XII. CONCLUSION**

Petitioner has established a reasonable likelihood that the Challenged Claims are unpatentable.

Respectfully submitted,

Dated: November 25, 2024  
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/Scott T. Jarratt/  
Scott T. Jarratt  
Lead Counsel for Petitioner  
Registration No. 70,297

### **XIII. MANDATORY NOTICES**

#### **A. Real party-in-interest**

Pursuant to 37 C.F.R. § 42.8(b)(1), Petitioner certifies that the real party-in-interest is Tesla, Inc.

#### **B. Related matters**

Pursuant to 37 C.F.R. § 42.8(b)(2), to the best knowledge of the Petitioner, the '670 Patent is or was involved in the following cases:

| <b>Case Heading</b>                                | <b>Number</b>                              | <b>Court</b> | <b>Filed</b>  |
|----------------------------------------------------|--------------------------------------------|--------------|---------------|
| <i>Intellectual Ventures II LLC v. Tesla, Inc</i>  | <i>WDTX-1-24-cv-00390</i><br>(terminated)  | WDTX         | Apr. 11, 2024 |
| <i>Intellectual Ventures II LLC v. Tesla, Inc.</i> | <i>WDTX-6-24-cv-00188</i><br>(pending)     | WDTX         | Apr. 12, 2024 |
| <i>Intellectual Ventures II LLC v. Tesla, Inc.</i> | <i>WDTX-1-24-cv-00884</i><br>(transferred) | WDTX         | Apr. 12, 2024 |

#### **C. Lead and back-up counsel and service information**

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Please address all correspondence in this proceeding to lead and back-up counsel. Petitioner consents to service in this proceeding by email at the addresses above.

**CERTIFICATE OF WORD COUNT**

Pursuant to 37 C.F.R. § 42.24(d), Petitioner hereby certifies, in accordance with and reliance on the word count provided by the word-processing system used to prepare this Petition, that the number of words in this paper is 13,911. Pursuant to 37 C.F.R. § 42.24(d), this word count excludes the table of contents, table of authorities, mandatory notices under § 42.8, certificate of service, certificate of word count, appendix of exhibits, and any claim listing.

Dated: November 25, 2024

/Scott T. Jarratt/  
Scott T. Jarratt  
Lead Counsel for Petitioner  
Registration No. 70,297

**CERTIFICATE OF SERVICE**

The undersigned certifies that, in accordance with 37 C.F.R. § 42.6(e) and 37 C.F.R. § 42.105, service was made on Patent Owner as detailed below.

*Date of service* November 25, 2024

*Manner of service* FEDERAL EXPRESS

*Documents served* Petition for *Inter Partes* Review Under 35 U.S.C. § 312  
and 37 C.F.R. § 42.104 of U.S. 11,206,670;  
Petitioner's Power of Attorney  
Petitioner's Exhibit List;  
Exhibits 1001-1020.

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