

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,

Petitioner,

v.

INTELLECTUAL VENTURES II LLC,

Patent Owner.

Case No. IPR2025-00218
U.S. Patent No. 10,136,416

PATENT OWNER'S PRELIMINARY RESPONSE

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PATENT OWNER'S EXHIBIT LIST

Ex. 2001	Declaration of Dr. Gary Lomp
Ex. 2002	Resume of Dr. Gary Lomp
Ex. 2003	Tesla, Inc.'s Opening Claim Construction Brief in <i>Intellectual Ventures II, LLC v. Tesla, Inc.</i> , Civil No. 1:24-cv-884-ADA, Document # 26, filed January 9, 2025
Ex. 2004	Docket from District Court Litigation, <i>Intellectual Ventures II LLC v. Tesla, Inc.</i> , C.A. WDTX-1:24-cv-884 (W.D. Tex.)
Ex. 2005	Petitioner's Invalidity Contentions In District Court

I. INTRODUCTION

The Petition challenges claims 1-12 (“Challenged Claims”) of U.S. Patent No. 10,136,416 (“‘416 Patent,” Ex. 1001) under two grounds of unpatentability. The Board should deny institution on the merits for at least three reasons.

First, all of the Challenged Claims recite “a plurality of bits, wherein “*each of the plurality of bits indicates a **respective** time interval.*” The juxtaposition of “*each of the plurality of bits*” with “*a respective* time interval,” signifies a *one-to-one* correspondence between each of the plurality of bits used to indicate the respective intervals and the respective time intervals themselves. The specification compels the same interpretation of the claim language. Neither Kim nor Vayanos meet this claim language.

Second, it would not have been obvious to combine Kim and Vayanos as proposed. The Challenged Claims recite a *two-step* sequence for informing a UE whether signaling information intended for the UE is present. Initially, the UE receives one of the plurality of bits that “*indicates* a respective time interval” The UE then subsequently *monitors* the “*indicated* time interval” to determine “whether signaling information for the UE is present *based on an identification of the UE.*” In contrast, Vayanos pre-assigns the location of each paging indicator to a specific wireless device, thereby *eliminating* the need for the specific wireless device to look for information *matching the specific-device’s identity* (e.g., the UE-ID of the

specific device) in order to find a message intended for the wireless device on the signaling channel. The proposed combination of Kim and Vayanos substitutes the paging indicator bits of Vayanos for the PICH of Kim, while at the same time retaining the aspects of Kim requiring a UE to check the paging channel (PCH) based on the UE's identifier to see if there is a paging message for that particular UE. The Petition has failed to explain why a POSITA would have been motivated to retain the aspects of Kim in which a UE checks the paging channel (PCH) based on the UE's identifier to see if there is a paging message for that particular UE, when the indicator techniques in Vayanos eliminated the need to do so.

Third, in the district court Petitioner maintains that information transmitted to “a targeted group” of UE’s in the cell -- rather than all UE’s in the cell -- is not “broadcast information.” However, in its mappings, the Petition interprets “broadcast information” in a manner diametrically opposed to Petitioner’s own position in the district court because the reference (Kim) relied on in the Petition for “broadcast information” discloses information intended for “a specific paging group.” The rules place the burden on the Petitioner to set forth “[h]ow the challenged claim is to be construed.” 37 C.F.R. 42.104(b)(3). Given that Petitioner’s mappings are based on a claim construction position that Petitioner opposes in the district and believes to be incorrect, Petitioner’s perfunctory statement that “no claim term

requires express construction” lacks is disingenuous and renders the Petition deficient.

In addition to denying institution on the merits, institution should be denied under the Fintiv factors, as the parallel district court litigation has already progressed significantly as of the expected institution date, including claim construction, technical tutorials, and substantial discovery. Given that the same prior art references are being evaluated in both proceedings, allowing an IPR on the same references would be duplicative and inefficient. It would also be unjust, allowing Petitioner to take simultaneous opposing positions of key claim construction arguments. For these reasons, the Board should deny institution under 35 U.S.C. § 314(a).

II. SPECIFICATION OF THE ‘416 PATENT

A. Background of the ‘416 Patent

1. Operation Of Conventional Paging Channels

The ‘416 Patent begins by explaining the operation of a conventional Paging Channel (PCH) in a Universal Mobile Telecommunications System:

In the known art, the PCH comprises two blocks: the Paging Indicator Channel (PICH) and the PCH itself. The PICH comprises multiple indicator bits. *Each UE is associated with one of the indicator bits within the PICH.* Accordingly, when the UE is paged by the network using the PCH, the network sets the relevant indicator bit in the PICH. *When in the idle state, the UE periodically decodes the PICH to see if the indicator bit with which it is associated has been set. If the relevant indicator has been set, the UE then reads the PCH.*

Each UE has a unique identifier (UE-ID). When the network pages a UE, as previously mentioned, the network sets the relevant

indicator within the PICH for that UE, and transmits the UE-ID for the UE being paged, and the relevant message within the PCH. In this manner, since more than one UE may be associated with an indicator bit in the PICH, the UE-ID enables a UE to determine whether the message is intended for that UE or not. If the PCH contains the UE-ID for the UE, the UE then reads the message, and performs the required actions. Thus, in the known art, the indicator bits are used in a paging channel to inform the UE whether it needs to turn its radio on for reading the PCH (i.e. as a battery saving mode). Ex. 1001, 2:11-33 (emphasis added).

Thus, in conventional paging systems, a UE first checks the PICH to determine whether an indicator bit associated with the UE has been set for the UE and, if so, the UE proceeds to read the relevant message (the message intended for the UE) on the PCH. Ex. 2001, ¶25.

2. Inefficient Usage Of FACH Channels In Prior Art

The Forward Access Channel (FACH) “is a downlink transport channel that is used ... to allocate physical resource to the UE.” *Id.*, 2:43-49. In conventional systems, the UE “decodes the FACH every frame” to determine “[i]f the UE-ID in the FACH message 220 matches the identity that has been assigned to the UE.” *Id.*, 3:41-45; Ex. 2001, ¶26. The Background of the ‘416 Patent discusses the problem that a timeslot for a FACH message is required to be reserved, even if there is no FACH or light FACH usage, which is an ineffective use of physical resources. From the ‘416 Patent:

... As previously mentioned, the physical resources 300 for the FACH are pre-assigned by the RNC 105, in the NODE B SETUP message

205, and cannot be reused by other channels. Even when the FACH is lightly used, for example when most UEs are in a connected state, receiving data traffic on a traffic channel, indicated as a High Speed Downlink Shared Channel (HS-DSCH) 305 in FIG. 3, the FACH timeslot 310 is still required to be reserved.

As will be appreciated by a skilled artisan, the fact that the FACH timeslot 310 is required to be reserved, particularly during light use of the FACH, is an inefficient use of physical resources. Consequently, the inventor of the present invention has recognized and appreciated that it is desirable for the timeslot 310 assigned to the FACH to be able to be used for other purposes when it is not required for the transmission of FACH messages. *Id.*, 3:50-65 (emphasis added).

3. Known Techniques For Reuse Of FACH Channels Increased Power Requirements

In connection with FIG. 3, the '416 Patent identified that "[a] known solution for the reuse for the FACH timeslot is for the traffic channel resources." *Id.*, 4:7-8. As shown in FIG. 3, a high-speed downlink shared channel (HS-DSCH) 305 is used for the transmission of FACH messages, and "the information that would have been transmitted on the FACH transport channel is instead transmitted on the HS-DSCH transport channel." *Id.*, 4:11-13; Ex. 2001, ¶27. "In this solution the Node B 110, as opposed to the RNC 105, controls the FACH, and the FACH timeslot of FIG. 3 becomes an HS-DSCH timeslot. In this manner, in the example of FIG. 3, the HS-DSCH 305 always comprises eight timeslots, as opposed to seven. *Id.*, 4:7-18. "When there are no requests from the RNC 105 for the Node B 110 to transmit a FACH message, the Node B is able to use all of the HS-DSCH 305 resource for traffic data. In this manner, physical resources are used more efficiently, and in

particular, physical resources are not permanently assigned for transmitting FACH messages, in particular when no, or few, FACH messages are required to be transmitted.” *Id.*, 5:1-3; Ex. 2001, ¶27.

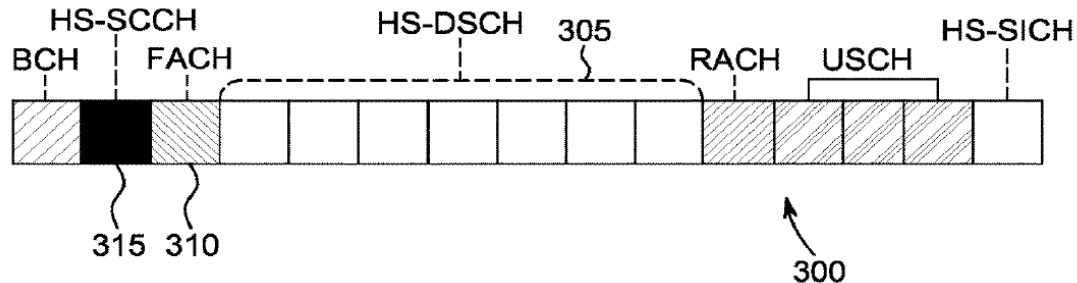


**FIG. 3
PRIOR ART**

However, a problem with the above approach of reusing the FACH timeslot is that it requires the use of both a high-speed shared control channel (HS-SCCH) and an HS-DSCH, as opposed to just a FACH channel, which increases power consumption. *Id.*, 5:9-14. So, although this technique may improve the use of physical resources, it increases power requirements, which is undesirable. *Id.*, 5:45-49; Ex. 2001, ¶28. As explained in the ‘416 Patent:

FACH messages may be transmitted to a UE 120 when the UE is in an idle state (or alternatively in a connected state). Accordingly, the Node B 110 is unaware of the state of the transmission path between itself and the UE 120. As a result, normal power control is ineffective since the Node B 110 has no information with which to make an informed decision on the appropriate power level to use. Consequently, the power requirements must initially depend on the

number of bits to be transmitted, and the coding rate, without explicit knowledge of the path loss between the UE and Node B.

A number of bits transmitted on the HS-SCCH 315 is comparable to a number of bits that are transmitted on a traditional FACH, in the order of 60 bits (57 bits for a 3.84 Mcps TDD HS-SCCH). The exact number of bits to be transmitted on the FACH depends on the particular implementation. The power requirements for HS-SCCH 315 and FACH at the start of a connection are therefore substantially the same, due to the similar number of bits to be carried on each channel, for example approximately 33% of the Node B transmit power.

A problem with this known technique for reusing the FACH timeslot is that both the HS-SSCH 315 and the HS-DSCH 305 must be used in order to transmit a FACH message, each requiring approximately 33% of the Node B transmit power, albeit in different timeslots. This is in contrast to the traditional method of transmitting FACH messages, where using the dedicated FACH timeslot only required the one timeslot. Thus, the known technique for reusing the FACH timeslot requires an additional timeslot at 33% of the Node B transmit power.

A skilled artisan will appreciate that, *although the reuse of the FACH timeslot by mapping the FACH onto HS-DSCH resources provides a considerable improvement in the use of the physical resources, this increase in the power requirements is undesirable. Id., 5:15-49 (emphasis added).*

B. Summary Of The Invention

The '416 Patent summarized the invention as follows:

According to a first aspect of the invention, there is provided a cellular communication network node comprising a transmitter operably coupled to signal processing logic and arranged to transmit at least one direct signaling channel indicator bit generated by the signal processing logic. The signal processing logic is arranged, upon receipt of a message to be transmitted, to set *at least one direct signaling channel indicator bit to indicate that a direct signaling channel is active* in at least one unit of resource. The signal processing logic is further arranged to reallocate the at least one unit of resource for use by at least

one other channel when no message is required to be transmitted. *Id.*, 5:56-67 (emphasis added).

The Summary of the Invention explained that “the at least one direct signaling channel may be a Forward Access Channel(s) (FACH)” that “may be re-allocated for use by a High Speed Downlink Shared Channel (HS-DSCH)” such that an “under-utilized FACH resource may be transferred to HS-DSCH resource, thus increasing the potential throughput of HS-DSCH.” *Id.*, 7:5-15; Ex. 2001, ¶30.

C. Detailed Description of the ‘416 Patent

To address the shortcomings of the prior art techniques, the ‘416 Patent discloses the use of indicator bits to inform a UE whether it should be reading the resources ‘reserved’ for FACH as a FACH channel, or whether it should be ignoring those resources (for example when they are being used for another channel such as HS-DSCH). *Id.*, 9:50-58; Ex. 2001, ¶31. The ‘416 Patent explains how the disclosed technique addresses the shortcomings of the prior art:

Furthermore, unlike for the known solution for reusing the FACH timeslot described above, as the HS-DSCH 505 and HS-SCCH 515 are not used for transmitting FACH messages, these two channels do not each require a significant proportion (e.g. approximately 33%) of the Node B transmit power when a FACH message is to be transmitted. Rather, only the FACH, when a FACH message is being transmitted, requires 33% of the Node B transmit power.

Thus, an embodiment of the invention may provide an advantage of a more efficient use of physical resources, whilst substantially avoiding an increase in power requirements. *Id.*, 12:64 to 13:8 (emphasis added).

The '416 Patent discloses embodiments where a plurality of indicator bits are sent over a broadcast channel (BCH). Ex. 2001, ¶32.

1. Exemplary Embodiments Where Each Of A Plurality Of Indicator Bits Is Used To Signal Whether A Respective FACH Channel In A Subsequent Timeslot Is Active

FIG. 7 (shown below) shows two frames (n, n+1), where each frame is divided into time slots 710 (i.e., 15 rectangles per frame). *Id.*, 13:15-20. The BCH 725 is a broadcast channel that includes an indicator channel (INCH) 721. *Id.* 13:17-20. The INCH 721 comprises a plurality of *FACH indicator bits*, each of which can correspond to a FACH in a subsequent frame. Ex. 2001, ¶33.

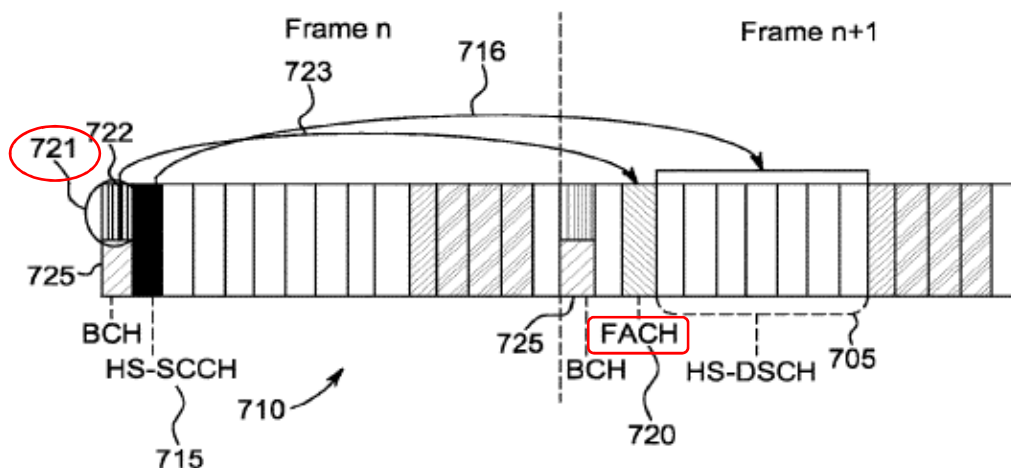


FIG. 7

In FIG. 7 (shown above), one of the FACH indicator bits 722 is highlighted (shaded black). *Id.*, 13:21-24. The highlighted FACH indicator bit 722 points to (arrow) the FACH 720 in the next frame. *Id.* 13:25-28. The FACH indicator bit 722

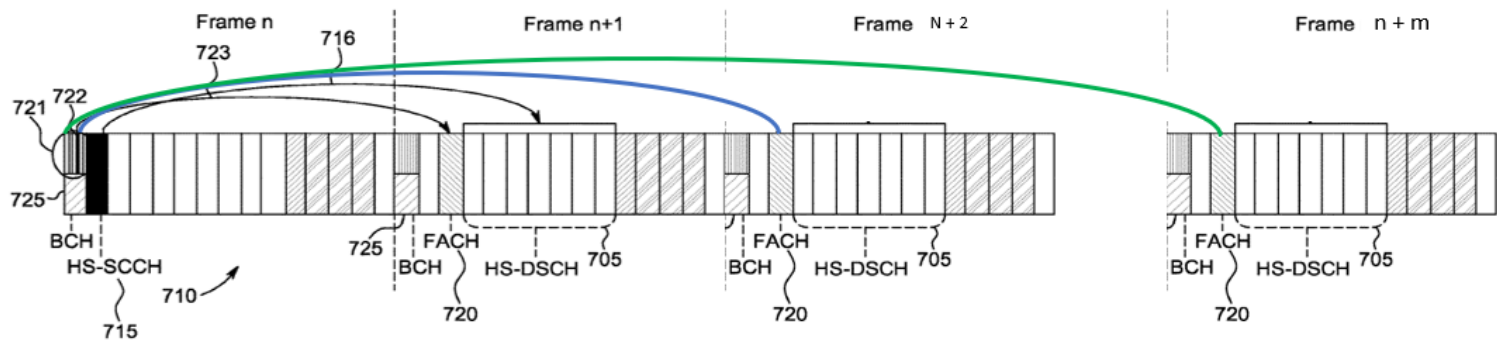
indicates the state of the FACH 720 (i.e., whether the FACH is active or not). *Id.*

13:25-30; Ex. 2001, ¶34. From the ‘416 Patent:

For the embodiments illustrated in FIG. 7, the INCH 721 comprises a plurality of indicator bits, one of which, for the illustrated embodiments, is in the form of a FACH indicator bit 722, which indicates the state of the FACH 720 in a subsequent frame of the physical channel. For the illustrated embodiments, the FACH indicator bit 722 in frame ‘n’ indicates 723 the state of the FACH 720 within the next consecutive frame, frame ‘n+1’. Thus, in FIG. 7, the FACH indicator bit 722 in frame ‘n’ is set, and thereby indicates that the FACH 720 is active in frame ‘n+1’. In this manner, the processing requirements placed on a UE 430 are reduced, since the UE 430 is provided more time in which to prepare to decode the FACH 720 if the FACH 720 is active. *Id.*, 13:21-34 (emphasis added)

While the example depicted in Figure 7 shows an embodiment where there was only one FACH channel 720 (in frame n+1), the specification explains that the embodiment of FIG. 7 could be extended to a system where the plurality of indicator bits 722 are used to signal whether FACH channels spanning multiple timeslots are each active. *Id.*, 14:44-53 (“For the various embodiments illustrated and described herein, a single timeslot has been allocated for FACH channels. However, a skilled artisan will appreciate that more than one timeslot may be allocated for FACH channels. Accordingly, and in accordance with an embodiment of the invention, where more than one timeslot is allocated for FACH channels, the one or more timeslots may, individually or collectively, and as a whole or partly, be re-allocated for use by other channels when not required for the transmission of FACH

messages.”) An example of such an embodiment, where the plurality of indicator bits 722 are used to signal whether FACH channels spanning multiple timeslots (e.g., FACH channels in subsequent frames) are each active, is illustrated in the diagram below (created by Patent Owner based on, e.g., FIG. 7 and 14:44-53 of ‘416 Patent):



Ex. 2001, ¶35. In the embodiment illustrated above, each one of the plurality of indicator bits 722 is used to signal whether a respective FACH channel in a subsequent timeslot is active. Ex. 2001, ¶36.

In contrast to FIG. 7 which contemplates a plurality of FACH channels (in subsequent frames) each of which corresponds to a different time interval, FIG. 9 (shown below) discloses an alternative embodiment where the plurality of FACH channels are arranged in the same time slot. Ex. 2001, ¶37. In Fig. 9, a plurality of FACH indicator bits 922 are included in the BCH, and each of the FACH indicator bits indicates whether a respective FACH channel 920 is active. *Id.* 13:67-14:4. As

shown in FIG. 9, two FACH indicator bits 922 are set and each FACH indicator bit points to a respective FACH 920. Ex. 2001, ¶37.

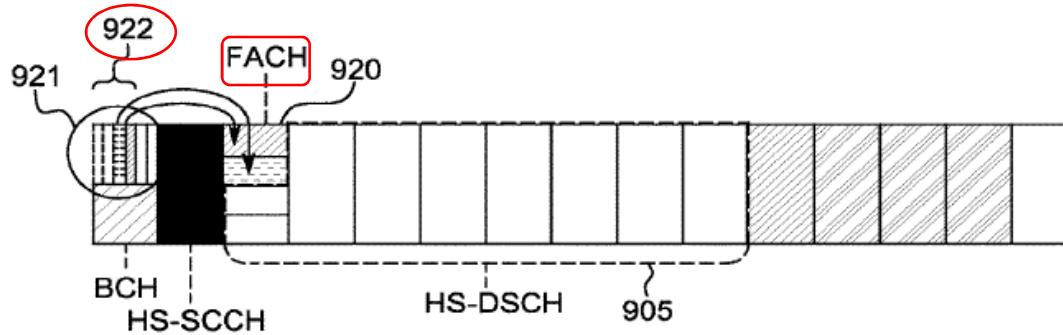


FIG. 9

As explained in the '416 Patent:

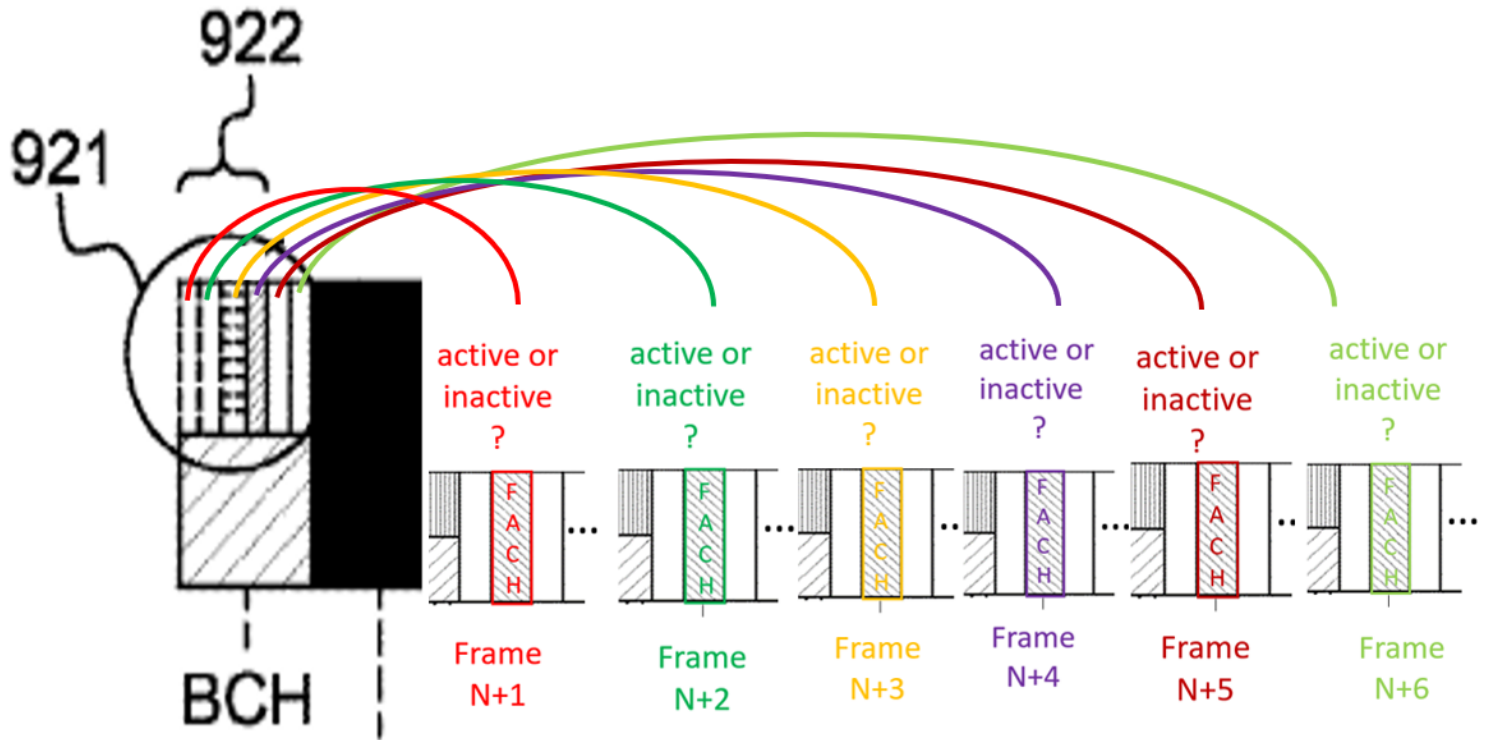
Referring now to FIG. 9, there is illustrated an example of resource allocation in accordance with embodiments of the invention. As in the embodiment illustrated in FIG. 8, four FACH channels are allocated to a single timeslot. However, for the embodiments illustrated in FIG. 9, the INCH 921 comprises a plurality of FACH indicator bits 922. For the illustrated embodiments, the INCH 921 comprises four FACH indicator bits 922, each FACH indicator bit 922 relating to one of the FACH channels 920.

In this manner, when the NODE B receives one or more FACH messages to be transmitted, the NODE B schedules transmission of the one or more FACH messages in one or more of the FACH channels 920, and sets one or more of the FACH indicator bits 922, to indicate those FACH channels 920 that are active.

Thus, FIG. 9 illustrates a case where the NODE B is required to transmit two FACH messages. Accordingly, the NODE B has set two of the FACH indicator bits 922, and transmits the FACH messages within the two corresponding FACH channels 920. As will be appreciated by a skilled artisan, for the embodiments illustrated in FIG. 9, only two out of four of the FACH channels 920 within the FACH

timeslot are used. Accordingly, and in accordance with an embodiment of the invention, the NODE B re-allocates the timeslot resource for those FACH channels not required for transmitting FACH messages, for use by another transport channel, such as the HS-DSCH 905. In this manner, even when the NODE B is required to transmit FACH messages, free resource within the FACH allocated timeslot may be reused for other channels. *Id.*, 13:63 to 14:25 (emphasis added).

While the embodiment depicted in FIG. 9 included four FACH channels in the same timeslot, the specification explains that the embodiment of FIG. 9 could be extended to a system where the plurality of indicator bits 922 are used to signal whether FACH channels across multiple timeslots are each active. *Id.*, 14:44-53 (“For the various embodiments illustrated and described herein, a single timeslot has been allocated for FACH channels. However, a skilled artisan will appreciate that more than one timeslot may be allocated for FACH channels. Accordingly, and in accordance with an embodiment of the invention, where more than one timeslot is allocated for FACH channels, the one or more timeslots may, individually or collectively, and as a whole or partly, be re-allocated for use by other channels when not required for the transmission of FACH messages.”). An example of such an embodiment, where the plurality of indicator bits 922 are used to signal whether FACH channels spanning multiple timeslots (e.g., FACH channels in subsequent frames) are each active, is illustrated in the diagram below (created by Patent Owner based on, e.g., FIGs. 7 and 9 and 14:44-53 of the ‘416 Patent):



Ex. 2001, ¶39. Again, in the embodiment described in the specification and illustrated above, *each* of the plurality of indicator bits 922 is used to signal whether a *respective* FACH channel in a subsequent timeslot is active. Ex. 2001, ¶40.

2. Monitoring FACH Channel(s) Indicated As Active To Determine Whether The Active FACH Channels Include A Message Intended For The UE

In a case where there are a plurality of FACH indicator bits, each of which corresponds to a FACH on a respective time slot, the UE monitors the FACH channels indicated as active for a FACH message intended for the UE. *Id.*, e.g., 9:50-56 (“in contrast to the known art ... the indicator bits are used to inform the UE whether it should be reading the resources ‘reserved’ for FACH as a FACH channel,

or whether it should be ignoring those resources”); *Id.*, 13:3-4 (each indicator bit “indicates the state of the FACH 720 in a subsequent frame”); *Id.*, 14:37-38 (“in accordance with embodiments of the invention, the UE is signaled whether the FACH is active”); and Ex. 2001, ¶41.

When a FACH channel is active, it will contain one or more FACH messages each of which has two parts. Specifically, the message includes (i) the identity of the UE for which the message is intended (e.g., in the form of a UE-ID), and (ii) the content of the message. *Id.*, 11:44-46 (the FACH message comprises “the content of the message, and the identity of the UE 430, such as a UE-ID for which the message is intended”); Ex. 2001, ¶42. While an indicator bit informs a given UE that a particular FACH channel is active and should be monitored, the fact that the FACH channel is active does not mean that the FACH channel includes a message for the given UE. For example, the active FACH channel could include a FACH message for a different UE. Ex. 2001, ¶42. Only by monitoring the active channel for a FACH message with, e.g., a UE-ID corresponding to a given a UE, does the given UE determine that there is a FACH message intended for the given UE on the active FACH channel. *Id.*, 3:43-46 (“If the UE-ID in the FACH message 220 matches the identity that has been assigned to the UE 120, the UE acts on the message contents”); Ex. 2001, ¶42.

It bears emphasis that in the disclosed embodiments, a two-step sequence of information is necessary to inform a given UE of a FACH message intended for the given UE. Specifically, the UE needs to be informed using an indicator bit on a broadcast channel (the first item of information in the sequence) that a particular FACH channel is active, and the UE needs to subsequently detect a message on the active FACH channel matching the identity or the UE-ID of the UE (the second item of information in the sequence.) This stands in contrast to the prior art identified in the Background of the ‘416 Patent where a single step is used to inform a given UE of a message intended for the given UE. Ex. 2001, ¶43. Since, in the prior art, “[e]ach UE is associated with one of the indicator bits on the PICH,” a UE in the prior art was informed that a message was intended for the UE by monitoring a single bit on the PICH. *Id.*, 2:12-20; Ex. 2001, ¶43. Thus, while singular information was used in the prior art (association of each UE with an indicator bit on the PICH) to inform a given UE of a message intended for the given UE, the embodiments disclosed in the ‘416 Patent require a two-step information sequence to inform a UE of a message intended for the UE. Ex. 2001, ¶43.

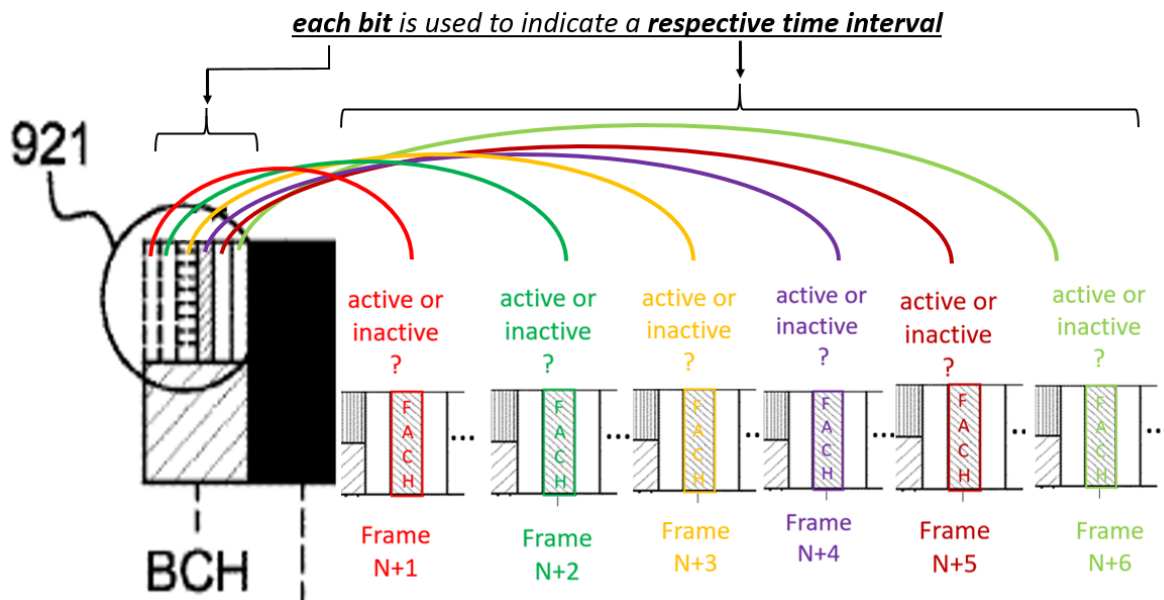
III. CHALLENGED CLAIMS OF THE ‘416 PATENT

Petitioner challenges independent Claims 1 and 7, and dependent claims 2-6 and 8-12 of the ‘416 Patent. Independent Claim 1 is representative, and recites:

1. A user equipment (UE) comprising:
a receiver, the receiver configured to receive broadcast information including a plurality of bits, wherein *each of the plurality of bits indicates a respective time interval* that physical shared channel resources are utilized to signal channels; and
a processor, the processor communicatively coupled to the receiver and configured to *monitor the signaled channels* in indicated time intervals, to *determine whether signaling information for the UE is present based on an identification of the UE*, and to process the signaling information in response to the determination that signaling information for the UE is present.

Significantly, claim 1 recites that “*each of the plurality of bits indicates a respective time interval* that physical shared channel resources are utilized to signal channels.”

This limitation corresponds, for example, to the embodiments of the ‘416 Patent discussed above (and reproduced again below), where *each* indicator bit (singular) transmitted on the BCH indicates whether a different FACH channel in a respective time interval is active. Ex. 2001, ¶45.



In addition, claim 1 recites that the UE monitors “the signaled channels in indicated time intervals, to determine whether signaling information for the UE is present based on an identification of the UE.” This limitation requires the two-step sequence of information discussed above to inform a given UE of a FACH message intended for it. Ex. 2001, ¶46. Specifically, the claim recites that the UE is first informed using an indicator bit on the broadcast channel (the first item of information in the sequence) of a respective time interval that physical shared channel resources are utilized to signal channels, e.g., the UE is informed by an indicator bit that a respective FACH channel in a subsequent time interval is active. Once the UE detects that the respective time interval is being utilized (e.g., that the respective FACH is active), the UE then monitors the indicated time intervals to determine “whether signaling information for the UE is present based on an identification of the UE” (e.g., the UE monitors the indicated time interval for a message with a UE-ID matching that of the UE.) Ex. 2001, ¶46.

IV. CLAIM CONSTRUCTION

The claim limitations at issue must be construed under *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005). Claim language is not read in isolation. *Phillips*, 415 F.3d at 1315. Rather, the claim language, when read in light of the specification, elucidates the meaning of the claim language.

A. “broadcast information including a plurality of bits, wherein each of the plurality of bits indicates a respective time interval that physical shared channel resources are utilized to signal channels” (claims 1 and 7)

As noted above, independent claim 1 recites a UE receiver “configured to receive broadcast information including a plurality of bits, wherein each of the plurality of bits indicates a **respective** time interval that physical shared channel resources are utilized to signal channels.” Independent claim 7 includes a virtually identical limitation. Both the plain meaning of the claim language and the specification make clear that there is a one-to-one correspondence between each of the plurality of bits used to indicate the respective intervals and the respective time intervals themselves, such that each single bit (in the plurality of bits) indicates whether a different (respective) time interval is used to signal channels. Ex. 2001, ¶48.

Turning first to the claim language itself, the juxtaposition of “each of the plurality of bits” with “a respective time interval,” signifies a one-to-one correspondence between each of the plurality of bits used to indicate the respective intervals and the respective time intervals themselves. Ex. 2001, ¶49. Moreover, in the context of the claim language, both the term “each” and the phrase “a respective time interval” are expressed in the singular, making clear that each single bit (in the plurality of bits) indicates whether a different (respective) time interval is used to signal channels. Ex. 2001, ¶49. Finally, all of the embodiments disclosed in the

specification reflect a one-to-one correspondence between each of the plurality of bits and a respective FACH channel, where each single bit (in the plurality of bits) indicates whether a different (respective) FACH channel is active. Ex. 2001, ¶49.

The Petition maintains that “no claim term requires express construction.” Pet., 15. However, Petitioner’s mappings raise a claim construction question with respect to the limitation at issue. Specifically, Petitioner, through its mappings, maintains that a group of bits (plural) that collectively indicate a single time interval meet the claim language. Ex. 2001, ¶50. Despite having the affirmative obligation to set forth in the Petition how the Challenged Claims are to be construed, the Petition fails to set forth even a basic argument or point to any intrinsic evidence articulating how “each of the plurality of bits indicates a **respective** time interval” could possibly be construed to cover “a **group** of the plurality of bits indicates a **respective** time interval.” 37 C.F.R. §42.104(b)(2). The absence of any such argument renders the Petition deficient.

For the reasons set forth above, the claim language reciting “each of the plurality of bits indicates a **respective** time interval” should be construed to require a one-to-one correspondence between each of the plurality of bits used to indicate the respective intervals and the respective time intervals themselves, such that each single bit (in the plurality of bits) indicates whether a different (respective) time interval is used to signal channels. Ex. 2001, ¶51.

B. monitoring “the signaled channels in indicated time intervals, to determine whether signaling information for the UE is present based on an identification of the UE” (claims 1 and 7)

As noted above, claim 1 also recites that the UE monitors “the signaled channels *in indicated time intervals*, to *determine whether signaling information for the UE is present based on an identification of the UE.*” Claim 7 includes a virtually identical limitation. Both the plain meaning of the claim language, and the specification, make clear that there are *two-steps* to inform a given UE “whether signaling information [e.g., a FACH message] *for the UE*” is present. Initially, the UE receives one of the plurality of bits indicating “a respective time interval that physical shared channel resources are utilized to signal channels.” Once the UE detects that the indicated time interval is being utilized, the UE then *monitors* for signaling information in “*indicated* time intervals” (past tense) to determine “*whether signaling information for the UE is present based on an identification of the UE.*” Ex. 2001, ¶52. The recitation that the UE monitor “*indicated* time intervals” imparts a temporal requirement that the indicating of the time intervals must occur *before* the monitoring of such *indicated* time intervals to determine “whether signaling information is present on such time interval based on an identification of the UE.” Ex. 2001, ¶52.

C. “broadcast information” (claims 1 and 7)

Independent claim 1 recites that the receiver is configured to receive “broadcast information including a plurality of bits.” Independent claim 7 recites the identical phrase. In the parallel district court litigation, Petitioner maintains that this term excludes indicator bits transmitted to a targeted group of UEs in a cell -- as opposed to being broadcast to all UEs in the cell. Ex. 2003, 28-31 (emphasis added). More specifically, Petitioner argued as follows in the district court:

... Although the claim does not explicitly state the information is received by “all UEs within a base station’s coverage area,” that is the plain meaning of “broadcast.” ... This interpretation is also consistent with the intrinsic record. ... The ‘416 patent distinguishes “broadcast” messages sent to “***all* UEs in a cell**” from communications “targeted” to particular UEs. *Id.* at 11:16–26 (“[T]he indicator bits may be either ***broadcast to all* UEs in a cell, or transmitted to a targeted group** of one or more UEs in a cell.”) Ex. 2003, 29 (emphasis in original).

Thus, in the district court, Petitioner maintains that information transmitted to “a targeted group” of UE’s in the cell -- rather than all UE’s in the cell -- is not “broadcast information.” The Petition fails to mention Petitioner’s claim construction in the district court, maintaining instead that “no claim term requires express construction.” Pet., 15. However, in its mappings, the Petition interprets “broadcast information” in a manner diametrically opposed to Petitioner’s position in the district court. Specifically, as explained more fully below, the primary reference (Kim) relied on in the Petition for “broadcast information” discloses information intended not for all UEs, but rather for “a specific paging group.” Ex.

1005, 1:38-46 (“Terminals are included in a specific paging group defined for an efficient paging procedure in a system. Therefore, the base station notifies that paging message arrives at terminals included in a corresponding group through the paging indication channel”); *Id.*, 4:59-63 (“the base station sets up a paging indication channel 6 corresponding to the terminal or the terminal group indicated by the paging information and forms the paging indication channel 6 at step S140 such that the terminal in the system can be divided into groups.”)

Thus, in the district court, Petitioner maintains that indicator bits transmitted to a target group of UEs (rather than all UEs) is outside the scope of “broadcast information,” but in these IPR proceedings Petitioner maintains that indicator bits transmitted to a target group of UEs (rather than all UEs) is within the scope of “broadcast information.” These positions are irreconcilable. It is improper for the Petitioner to maintain that the Challenged Claims are obvious in these proceedings based on a claim construction that Petitioner asserts (in the district court) is incorrect. At the very least, Petitioner should have informed the Board that it was taking a position in these proceedings that conflicted with Petitioner’s position in the district court.

V. A PERSON HAVING ORDINARY SKILL IN THE ART

For purposes of the institution decision only, Patent Owner does not contest the definition of a person of ordinary skill in the art (“POSITA”) proposed in the

Petition. Pet., 14-15. Patent Owner reserves the right to contest Petitioner’s proposed definition of a POSITA if a trial is instituted.

VI. APPLICABLE LEGAL STANDARDS

The Board may only institute a trial where “the information presented in the petition ... shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a); 37 C.F.R. § 42.108(c). Accordingly, the Petitioner bears the burden of showing this statutory threshold has been met. *See* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,756 (August 14, 2012) (“The Board ... may institute a trial where the petitioner establishes that the standards for instituting the requested trial are met...”)

VII. PRIOR ART RELIED ON IN PETITION

The Petition advances two Grounds against the Challenged Claims of the ‘416 Patent. In Ground 1, the Petition asserts that the Challenged Claims are obvious over a combination of Kim and Vayanos. In Ground 2, the Petition asserts that the Challenged Claims are obvious over a combination of Kim, Vayanos, and the so-called AAPA.

A. Kim

As its primary reference, the Petition relies on Kim. Kim is directed to a method for transmitting paging information in a cellular system. Ex. 1005, 1:6-7.

While Kim discloses the use of a paging indication channel (PICH) that terminals in a group monitor to determine whether to search a paging channel (PCH), Kim is silent as to the format of the indication information in the PICH. Ex. 2001, ¶55.

Kim's description of the paging indicator channel is limited to the following:

A general paging procedure is as follows. Terminals are included in a specific paging group defined for an efficient paging procedure in a system. Therefore, the base station notifies that a paging message arrives at terminals included in a corresponding group through the paging indication channel (PICH), which is a physical layer channel. The terminals monitor the paging indication channel every monitoring cycle. As a result of monitoring, when it is sensed that indication information corresponding to the group including the terminal exists in the paging indication channel, the terminals search PCH information. ... *Id.*, 1:38-48 (emphasis added).

* * *

In accordance with an aspect of the present invention, there is provided a method for transmitting paging information in a cellular system, including the steps of forming a paging channel (PCH) in a transport channel corresponding to generation of paging information; setting a paging indication channel (PICH) based on the paging information and forming the paging indication channel in a radio resource of a physical layer; and allocating the paging channel to the radio resource of the physical layer. *Id.*, 2:30-38 (emphasis added).

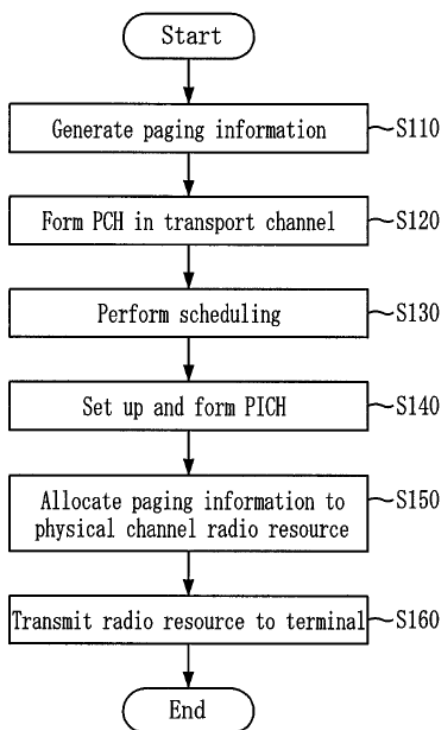
* * *

... the base station sets up a paging indication channel 6 corresponding to the terminal or the terminal group indicated by the paging information and forms the paging indication channel 6 at step S140 such that the terminal in the system can be divided into groups. *Id.*, 4:58-63 (emphasis added).

Thus, while Kim discloses the use of a PICH, it fails to disclose the format of the indication information in the PICH. Ex. 2001, ¶56.

The Petition relies on Kim’s method disclosed in FIG. 1 (shown below), which depicts “a paging information transmission procedure” performed by a base station. *Id.*, 2:65-67.

FIG. 1



In connection with the first two steps in FIG. 1, Kim discloses that when paging information 1 to be transmitted to a terminal is generated at step S110, the base station has a paging channel (PCH) included in the transport channel based on the generated paging information at step 120.” *Id.*, 4:48-52; Ex. 2001, ¶58. In the next

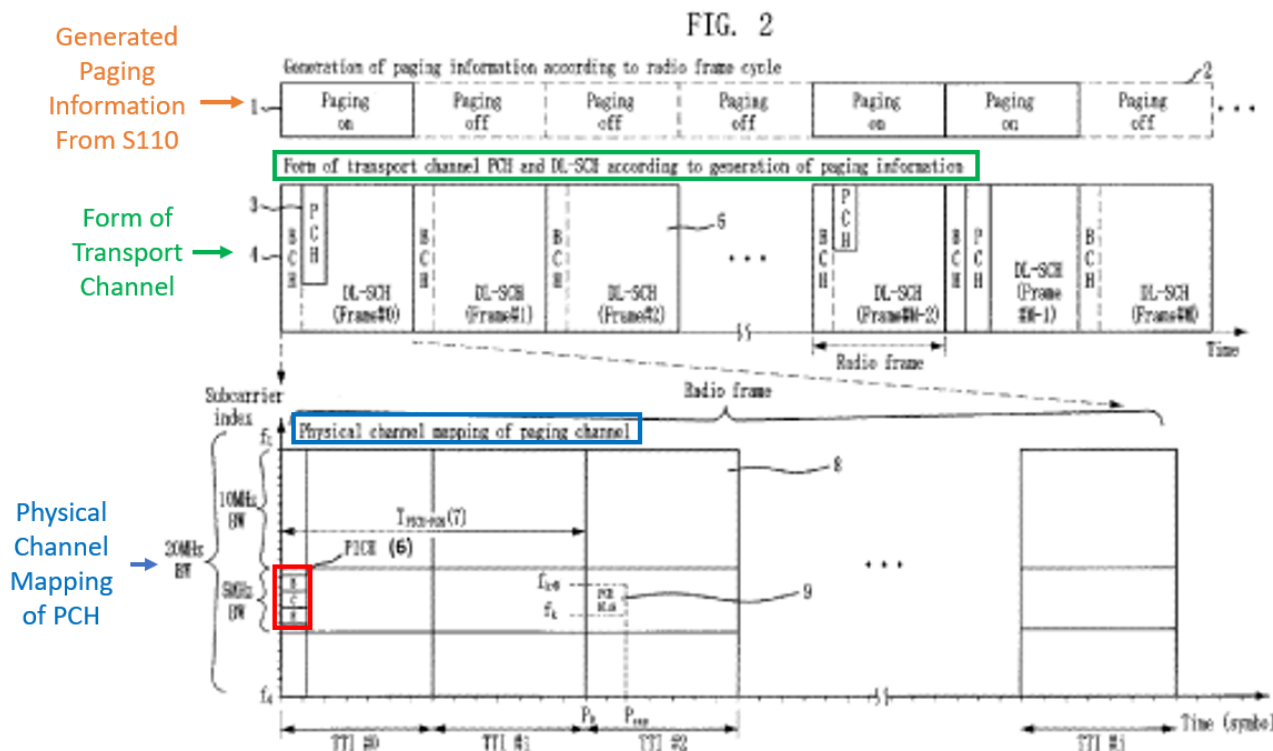
step (S130), a scheduler at the base station “performs scheduling on broadcasting channel (BCH) information, create[s] paging channel information and, traffic information to be transmitted to the terminal based on a transmission time interval (TTI).” *Id.*, 4:53-56; Ex. 2001, ¶58. Next, in step S140, “the base station sets up a paging indication channel 6 corresponding to the terminal or the terminal group indicated by the paging information and forms the paging indication channel 6.” *Id.*, 4:58-63; Ex. 2001, ¶58. In steps S150 and 160, “the base station performs mapping on the paging channel” and “transmits the radio resources to the terminal.” *Id.*, 4:64-5:8; Ex. 2001, ¶58.

Significantly, Kim makes clear that the PICH is set up only in a case where paging information was generated (e.g., in step S110 described above):

... When no paging information is generated (see 2 of FIG. 2), the paging channel does not exist in the transport channel of the radio frame (see 5 of FIG. 2). In this case, the paging indication channel is not also set up. *Id.*, 5:9-17 (emphasis added).

Ex. 2001, ¶59. FIG. 2 of Kim “shows a transport channel and a physical channel in accordance with the first embodiment.” *Id.*, 3:1-2. As shown in the annotated version of FIG. 2 reproduced below, the “**form of transport channel**” (see language in **green box**) is positioned in the middle of the figure, while the “**physical channel mapping of the paging channel**” (see language in **blue box**) is positioned at the bottom of the figure. The “**physical channel mapping of the paging channel**” includes **PICH 6** (**red**

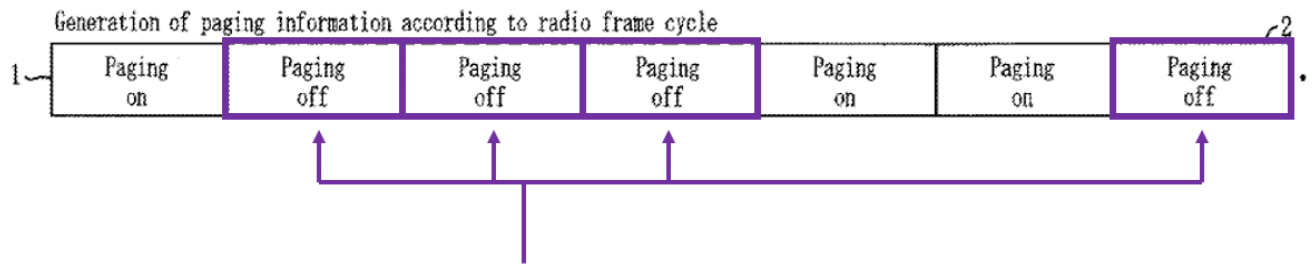
box). Ex. 2001, ¶60. Other than showing boxes labelled “B,” “C” and “H,” FIG. 2 provides no further details on the format of the PICH. Ex. 2001, ¶60.



Referring still to FIG. 2 above, the top portion of the figure corresponds to the paging information generated at the base station in step S110, which the base station uses internally to determine whether or not to form the PCH in step S120. Ex. 2001, ¶61.

The Petition (at 42-43) erroneously argues that the paging information at the top portion of FIG. 2 is transmitted to a terminal in the form of “a plurality of bits.” Ex. 2001, ¶61. Kim makes no such statement, and Kim’s disclosure compels the opposite conclusion. As noted above, Kim discloses that “[w]hen no paging information is generated (see 2 of FIG. 2), the paging channel **does not exist** in the

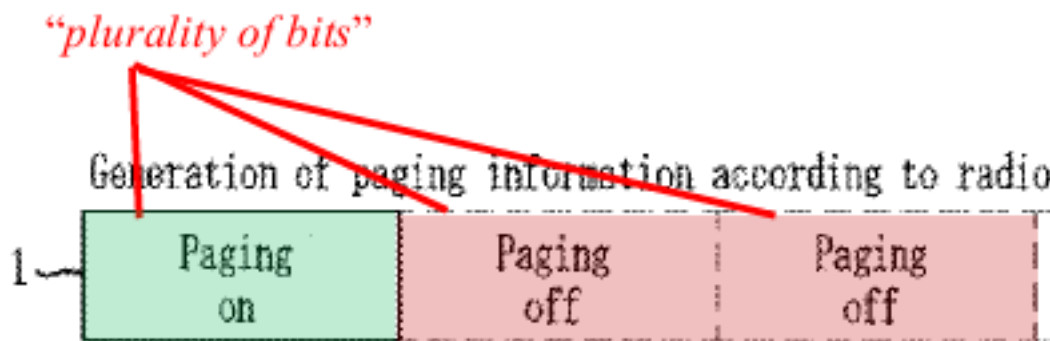
transport channel of the radio frame (see 5 of FIG. 2). In this case, *the paging indication channel is not also set up.*” *Id.*, 5:9-17 (emphasis added). Thus, Kim makes clear that no paging indicator information (or any other paging information) is transmitted to the terminal for the boxes labelled “Paging off” in the top row of FIG. 2. Ex. 2001, ¶61.



When no paging information is generated (see 2 of FIG. 2), the paging channel does not exist in the transport channel of the radio frame (see 5 of FIG. 2). In this case, *the paging indication channel is not also set up.*” *Id.*, 5:9-17 (emphasis added).

Thus, contrary to the illustration (reproduced below) set forth in the Petition, it is clear that the top portion of FIG. 2 in Kim does *not* correspond to a “plurality of bits” transmitted from the base station to the terminal, because in Kim there is a complete absence of paging indicator information (not even a single bit) transmitted for the boxes labelled “Paging Off.” Rather, a POSITA would have understood that the top portion of FIG. 2 corresponds to the paging information generated at the base station in step S110, *which the base station uses internally to determine whether or not to form the PCH in step S120* -- rather than a string of bits transmitted to the terminal as argued in the Petition. Ex. 2001, ¶62.

Below is the illustration from the Petition, which erroneously suggests that the paging information at the top portion of FIG. 2 in Kim is transmitted to a terminal in the form of individual paging bits:

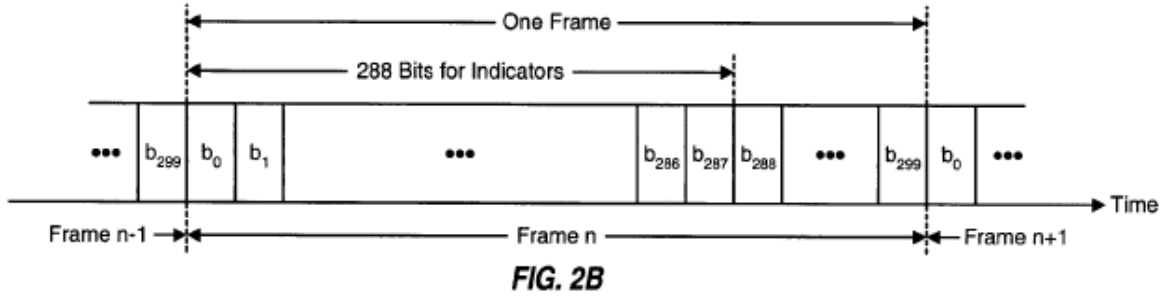


Ex. 2001, ¶63. The Petition fails to explain how the boxes labelled “Paging Off” could correspond to bits transmitted to a terminal in Kim, when Kim states that there is a complete absence of paging indicator information (not even a single bit) transmitted for the boxes labelled “Paging Off.” Ex. 2001, ¶63.

B. Vayanos

1. In Vayanos, Each Paging Indicator Includes Multiple Bits, All Of Which Have The Same Value

Vayanos is directed to transmitting signaling information for broadcast and multicast services. Vayanos describes a need to transmit signaling information for broadcast and multicast services in a manner to facilitate efficient reception of this information. Ex. 1006, 1: 49-51. Vayanos provides an example format of one frame of a PICH in FIG. 2B, reproduced below:



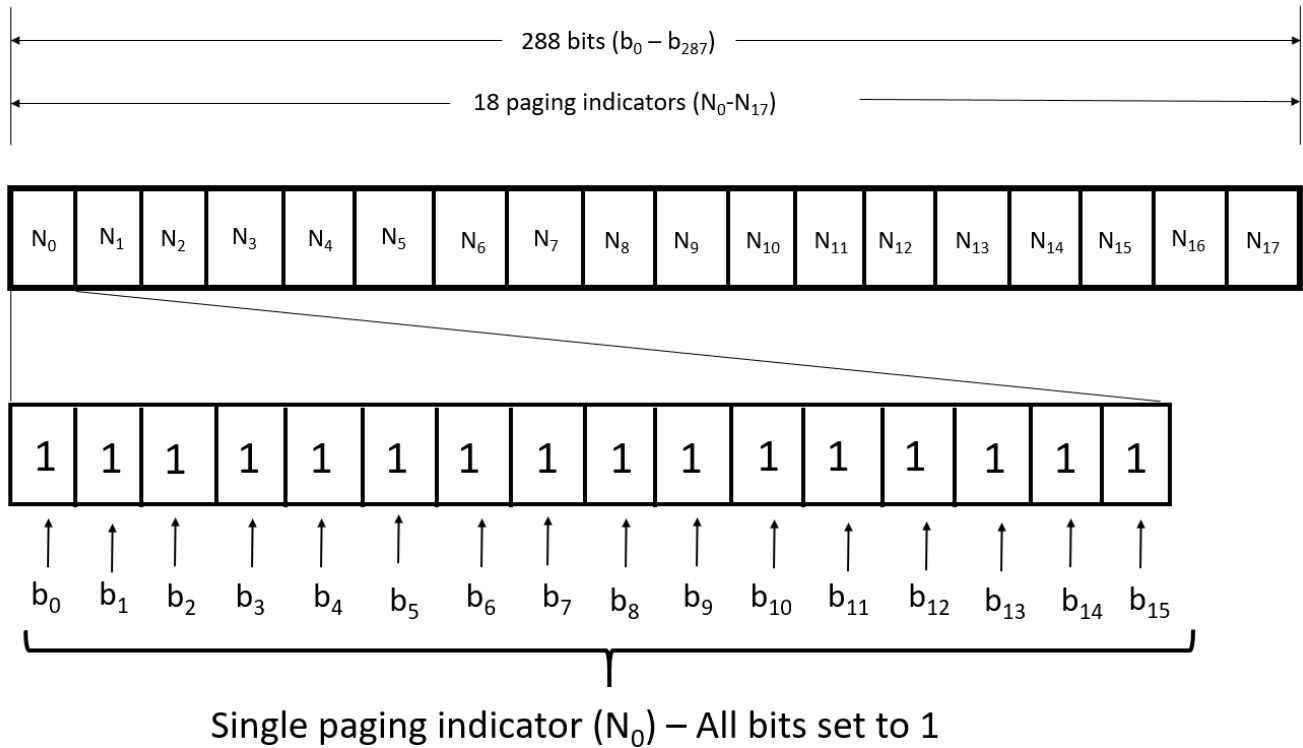
Vayanos describes FIG. 2B as follows:

FIG. 2B shows the format of one frame for the PICH. Each PICH frame includes 300 bits, which are labeled as bits b_0 through b_{299} . The first 288 bits are used for N_p paging indicators, and the last 12 bits are reserved. The number of paging indicators (N_p) in each PICH frame is configurable by the system and can take on a value of 18, 36, 72 or 144. Each paging indicator is sent in $288/N_p$ consecutive bits in the PICH frame, where $288/N_p$ can take on a value of 16, 8, 4 or 2. The $288/N_p$ bits are all set to 1 if the paging indicator is equal to 1 and are set to 0 if the paging indicator is equal to 0. The N_p paging indicators are sent in N_p paging indicator locations that are numbered from 0 through $N_p - 1$ (not shown in FIG. 2B). *Id.*, 3:26-38 (emphasis added).

Thus, each PICH frame in Vayanos includes 288 bits being used for N_p paging indicators. *Id.*, 3:26-29; Ex. 2001, ¶66. The number of paging indicators (N_p) in each frame is configurable and can take a value of 18, 36, 72, or 144, meaning that $288/N_p$ (which corresponds to the number of bits per paging indicator) takes on a value of 16, 8, 4, or 2. *Id.*, 3:29-34. For example, if there are 18 ($N_p = 18$) paging indicators, $288/N_p = 288/18 = 16$ (meaning that each paging indicator is 16 bits long), if there are 36 ($N_p = 36$) paging indicators, $288/N_p = 288/36 = 8$ (meaning that each paging indicator is 8 bits long), if there are 72 ($N_p = 72$) paging indicators, $288/N_p = 288/72 = 4$ (meaning that each paging indicator is 4 bits long), and if there

are 144 ($N_p=144$) paging indicators, $288/N_p = 288/144 = 2$ (meaning that each paging indicator is 2 bits long.) Ex. 2001, ¶66. Thus, in all of the embodiments in Vayanos, each paging indicator (singular) includes multiple bits, i.e., each paging indicator (singular) has either 16, 8, 4 or 2 bits. Vayanos does not disclose a paging indicator having only a single bit. Ex. 2001, ¶66.

Significantly, in Vayanos, all of the bits in a given paging indicator (always made up of multiple bits) are set to the same value. Specifically, the multiple bits in a given paging indicator “are all set to 1 if the paging indicator is equal to 1 and are set to 0 if the paging indicator is equal to 0.” *Id.*, 3:34-36 (emphasis added); Ex. 2001, ¶67. Below is a diagram (created by Patent Owner) illustrating the format of the 288 bits (b_0 - b_{287}) used for the paging indicators in Vayanos, where the 288 bits are used to implement 18 paging indicators (N_0 to N_{17}). Each of the 18 paging indicators includes 288/18 bits (or 16 bits). As described in Vayanos, all of the bits (b_0 - b_{15}) in the first paging indicator (N_0) are set to the same value, either 0 or 1. In the diagram below, all bits in the first paging indicator are shown as set to 1, but alternatively, all such bits could be set to 0. Ex. 2001, ¶67.



2. In Vayanos, Each Wireless Device Knows *A Priori* When To Read Information Intended From The Wireless Device On The Control Channel

In Vayanos, the location of each paging indicator in a given paging occasion is pre-assigned to a specific wireless device. Ex. 2001, ¶68. As Vayanos explains, “[e]ach idle wireless device is mapped to a specific PI value based on its IMSI. The wireless device is also assigned a paging indicator in each paging occasion. This paging indicator is sent at a location that is determined based on a hash function $f(\text{PI}, \text{SFN})$. The location of the paging indicator for the wireless device is thus determined by both the IMSI for the wireless device and the SFN for the paging occasion.” *Id.*, 3:39-46. In this respect, Vayanos is similar to the prior art identified in the

Background of the ‘416 Patent where a single step is used to inform a given UE of a message intended for the given UE. Compare, Ex. 1001, 2:12-20 (Background of ‘416 Patent explaining that, in the prior art, “[e]ach UE is associated with one of the indicator bits on the PICH”) with Ex. 1006 (Vayanos), 3:39-46 (“[e]ach idle wireless device is ... assigned a paging indicator in each paging occasion. This paging indicator is sent at a location that is determined by “the IMSI for the wireless device and the SFN for the paging occasion”); Ex. 2001, ¶68. Thus, like the prior art discussed in the Background of the ‘416 Patent, in Vayanos the paging indicator by itself informs a given UE that a message intended for the UE had been sent. *Id.*, 2:12-20; Ex. 2001, ¶68.

By pre-assigning the location of each paging indicator to a specific wireless device, Vayanos eliminates the need for the specific wireless device to look for information matching the specific-device’s identity (e.g., the UE-ID of the specific device) in order to find a message intended for the wireless device on the signaling channel. Ex. 2001, ¶69. More specifically, as a result of having a pre-assigning location for indicator bits on the paging indicator channel, a specific UE is informed *a priori* where to look for the indicated message when the indicator bits for the specific UE are set. *Id.*, 11:37-40 (“Transmission of notifications “can provide various advantages, such as: Simplify wireless device implementation since the wireless devices know *a priori* based on the MCCH schedule how long the

notification will be sent on the MICH and when it would be useful to read the MCCH”); Ex. 2001, ¶69. Thus, unlike the disclosed embodiments of the ‘416 Patent where an active indicator merely informs a UE that there *might* be a message intended for the UE (causing the UE to subsequently search the signaling channel for its UE-ID to see *if* a message intended for the UE actually exists there), in Vayanos the pre-assigned location of an active (multiple-bit) indicator informs a specific UE that a message intended for the UE *in fact exists* on the signaling channel at a location known *a priori* to the UE (eliminating any need for the UE to subsequently search the signaling channel for its UE-ID). Ex. 2001, ¶69.

VIII. GROUND 1 FAILS TO DEMONSTRATE A REASONABLE LIKELIHOOD OF SUCCESS ON THE MERITS

Petitioner fails to demonstrate that the prior art — Kim and Vayanos — disclose or suggest the claim limitation requiring a UE to receive “a plurality of bits, wherein each of the plurality of bits indicates a respective time interval that physical shared channel resources are utilized to signal channels.” The Petition relies on flawed mappings that do not satisfy this claim limitation and fails to provide a consistent claim construction. Specifically, Petitioner advances two mappings to support its position, both of which are fundamentally deficient. The first mapping, which relies on the PICH frame in Vayanos, improperly relies on a many-to-one relationship between multiple indicator bits and a single time interval, contradicting the one-to-one correspondence explicitly required by the Challenged Claims. The

second mapping, based on Kim's "Paging On"/"Paging Off" blocks, is also inadequate because these blocks do not correspond to transmitted bits at all, let alone a plurality of bits received by a UE.

Beyond these deficient mappings, Petitioner also fails to establish a valid rationale for modifying the combination of Kim and Vayanos to meet the claim limitation. Vayanos assigns paging indicator bits to specific UEs, thereby eliminating the need for those UEs to search for signaling information based on their identities. Petitioner does not explain why a POSITA would have been motivated to modify this technique in a way that reintroduces such a search, undermining the efficiency of the Vayanos approach. By failing to provide a compelling reason for this modification, Petitioner has not demonstrated that the combination of Kim and Vayanos would have rendered the challenged claims obvious.

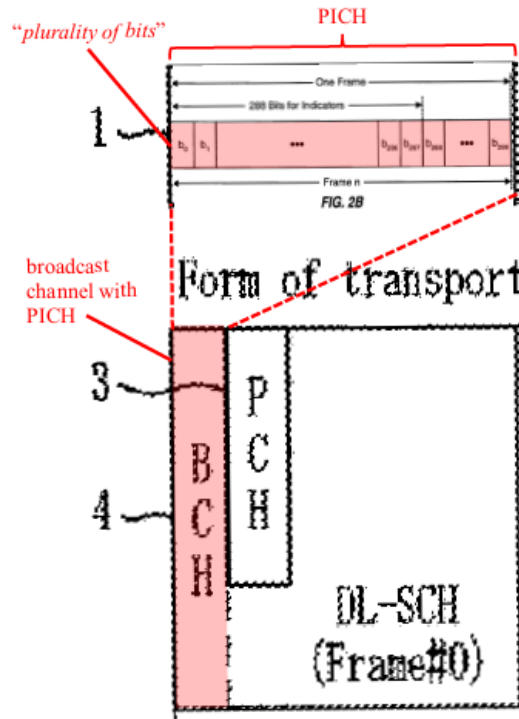
Additionally, Petitioner's inconsistent interpretation of "broadcast information" further weakens its case. In the district court, Petitioner has argued that information sent to a targeted group of UEs is not "broadcast information." Yet, in these proceedings, Petitioner relies on Kim and Vayanos, which disclose information directed to specific paging groups or individual UEs as being "broadcast information." This contradiction fails to satisfy the claim construction requirements of 37 C.F.R. § 42.104(b)(3) and renders the Petition deficient. For these reasons, and

as explained more fully below, Ground 1 does not establish a reasonable likelihood of success.

A. Neither Kim Nor Vayanos Disclose Receiving “A Plurality Of Bits, Wherein Each Of The Plurality Of Bits Indicates A Respective Time Interval That Physical Shared Channel Resources Are Utilized To Signal Channels”

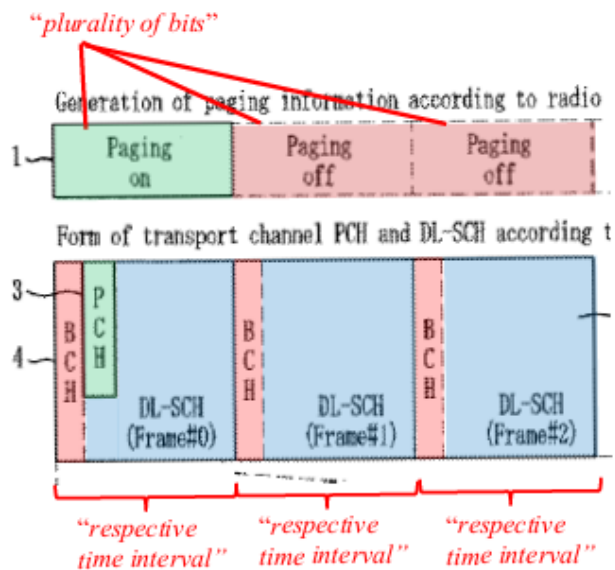
The Challenged Claims recite a UE receiver that receives “a plurality of bits, wherein each of the plurality of bits indicates a *respective time interval* that physical shared channel resources are utilized to signal channels.” As explained above, this claim language requires a one-to-one correspondence between each of the plurality of bits used to indicate the respective time intervals and the respective time intervals themselves, such that each single bit (in the plurality of bits) indicates whether a different (respective) time interval is used to signal channels. *See*, Section IV(A), *supra*.

The Petition advances two mappings purporting to show that Kim/Vayanos meet this limitation. The first mapping uses the annotated combination of FIG. 2B of Vayanos and FIG.2 of Kim reproduced below:



Pet., 39. This mapping will be referred to hereinafter as the "First Mapping."

The second mapping is based on an annotated version of the "Paging on, Paging off, Paging off" blocks at the top of FIG. 2 of Kim, reproduced below:

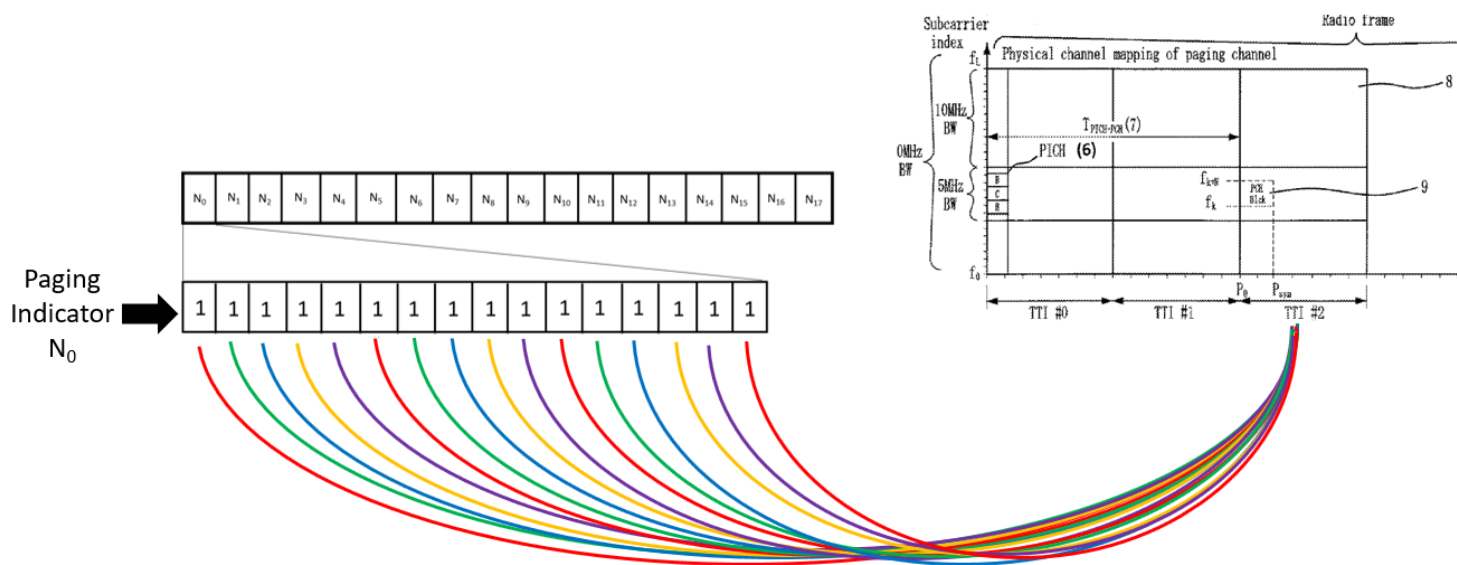


Pet., 43. This mapping will be referred to hereinafter as the "Second Mapping."

As discussed below, neither of these mappings show reception by the UE of “a plurality of bits, wherein each of the plurality of bits indicates a respective time interval that physical shared channel resources are utilized to signal channels,” as recited in Claims 1 and 7 of the ‘416 Patent.

1. The First Mapping Is Deficient Because The PICH Frame In Vayanos Lacks “a plurality of bits, wherein each of the plurality of bits indicates a respective time interval that physical shared channel resources are utilized to signal channels”

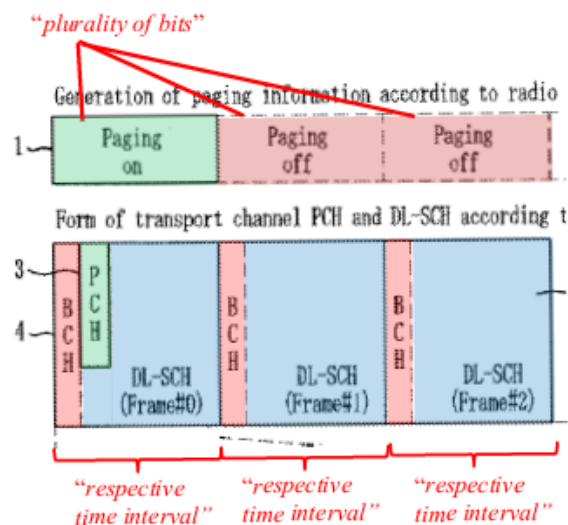
As explained above, Vayanos does not disclose a paging indicator having only a single bit. Rather, in all of the embodiments in Vayanos, each paging indicator (singular) includes multiple bits, i.e., each paging indicator (singular) has either 16, 8, 4 or 2 bits. *See*, Section VII(B), *supra*; Ex. 2001, ¶74. Moreover, in Vayanos, all of the bits in a given paging indicator (always made up of multiple bits) are set to the same value. *Id.*, 3:34-36 (the multiple bits in a given paging indicator “are all set to 1 if the paging indicator is equal to 1 and are set to 0 if the paging indicator is equal to 0”); Ex. 2001, ¶67. In the Kim-Vayanos combination advanced in the Petition, all of the bits in a given paging indicator (always made up of multiple bits) correspond to a single (common) time interval. This “many-to-one” relationship between the multiple bits in a paging indicator in Vayanos and a single (common) time interval (a TTI from Kim) is depicted in the illustration (created by Patent Owner) below. Ex. 2001, ¶74.



between the indicator bits and a particular time interval in Vayanos meets the claim language.

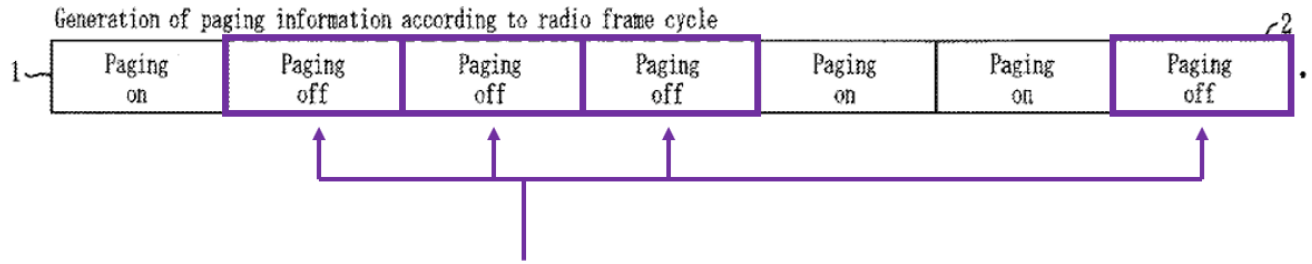
2. The Second Mapping Is Deficient Because The “Paging On”/“Paging Off” Blocks Shown In FIG. 2 Of Kim Are Not Bits That Are Transmitted To A Terminal

Alternatively, the Petition advances the Second Mapping, which purports to map the claim limitation requiring that the *UE receives* “a plurality of bits, wherein each of the plurality of bits indicates a respective time interval that physical shared channel resources are utilized to signal channels,” to the “Paging on, Paging off, Paging off” blocks at the top of FIG. 2 of Kim. An annotated version of these “Paging on, Paging off, Paging off” blocks from Kim was set forth at page 43 of the Petition and is reproduced below:



Ex.1005, Fig. 2 (partial, annotated); Ex.1003, ¶91.

This mapping fails because, as explained in Section VII(A), *supra*, the “Paging On”/“Paging Off” blocks at the top portion of FIG. 2 of Kim are not transmitted to a terminal as “a plurality of bits.” Ex. 2001, ¶77. Instead, Kim’s disclosure compels the opposite conclusion because the reference explains that “[w]hen no paging information is generated (see 2 of FIG. 2), the paging channel does not exist in the transport channel of the radio frame (see 5 of FIG. 2). In this case, *the paging indication channel is not also set up.*” *Id.*, 5:9-17 (emphasis added). Thus, *no paging indicator information* (or any other paging information) is *transmitted to the terminal* for the boxes labelled “*Paging off*” in the top row of FIG. 2 of Kim. Ex. 2001, ¶77.



When no paging information is generated (see 2 of FIG. 2), the paging channel does not exist in the transport channel of the radio frame (see 5 of FIG. 2). In this case, the paging indication channel is not also set up.” *Id.*, 5:9-17 (emphasis added).

Thus, the “Paging On”/“Paging Off” blocks at the top portion of FIG. 2 in Kim do *not* correspond to a “plurality of bits” transmitted from the base station to the terminal, because in Kim there is a complete absence of paging indicator information (not even a single bit) transmitted for the boxes labelled “Paging Off.” Ex. 2001, ¶78.

A POSITA would have understood that the top portion of Kim's FIG. 2 corresponds to the paging information generated at the base station in step S110, which the base station uses internally to determine whether or not to form the PCH in step S120 -- rather than a string of bits transmitted to the terminal as argued in the Petition. Ex. 2001, ¶78.

Simply put, there is no "plurality of bits" sent to the UE corresponding to Kim's "Paging On"/"Paging Off" blocks, as suggested in the Second Mapping set forth on pages 42-43 of the Petition. Accordingly, the Second Mapping fails to demonstrate that a UE receives broadcast information that includes such a "plurality of bits," as claimed. Ex. 2001, ¶79.

Finally, it bears noting that the Second Mapping -- which maps "the plurality of bits" in element [1.2] to the "Paging on, Paging off, Paging off" blocks at the top of FIG. 2 of Kim -- is inconsistent with the mapping of "a plurality of bits" set forth for element [1.1]. More specifically, in connection with element [1.1], the Petition maps "a plurality of bits" to the 288 paging indicator bits of Vayanos. Pet., 37-40. Given that the Petition maps "a plurality of bits" to the paging indicator bits of Vayanos, it is improper for the Petition to rely on the "Paging on, Paging off, Paging off" blocks of Kim for "the plurality of bits" in connection with element [1.2] later in the claim. This internal inconsistency between the mappings for "a plurality of bits" and "the plurality of bits" also renders the Second Mapping deficient.

B. It Would Not Have Been Obvious To Combine Kim And Vayanos In A Manner That Met The Claim Language

The Petition argues that it would have been obvious to combine Vayanos and Kim in a manner that meets all of the elements of the independent claims of the ‘416 Patent. Patent Owner disagrees. As explained below, if the 288 paging indicator bits of Vayanos were used to implement the PICH of Kim, a POSITA would not have been motivated to have the UE subsequently monitor “the signaled channels in indicated time intervals, to determine whether signaling information for the UE is present *based on an identification of the UE*,” as claimed. Ex. 2001, ¶80.

As discussed in Section IV(B), *supra*, in the Challenged Claims there are *two steps* to inform a given UE “whether signaling information [e.g., a FACH message] *for the UE*” is present. Initially, the UE receives one of the plurality of bits indicating “a respective time interval that physical shared channel resources are utilized to signal channels.” Once the UE detects that the indicated time interval is being utilized, the UE subsequently *monitors* for signaling information in the “indicated time interval” to determine “whether signaling information for the UE is present *based on an identification of the UE*.” Ex. 2001, ¶81.

In contrast to the disclosed embodiments in the ‘416 Patent, Vayanos pre-assigns the location of each paging indicator to a specific wireless device, thereby eliminating the need for the specific wireless device to look for information matching the specific-device’s identity (e.g., the UE-ID of the specific device) in

order find a message intended for the wireless device on the signaling channel. Ex. 2001, ¶82. As explained in Section VII(B)(2), *supra*, as a result of having a pre-assigned location for indicator bits on the paging indicator channel, a specific UE in Vayanos is informed *a priori* where to look for the indicated message when the indicator bits for the specific UE are set. Ex. 1006, 11:37-40; Ex. 2001, ¶82. Thus, unlike in the ‘416 Patent where an active indicator merely informs a UE that there *might* be a message intended for the UE (causing the UE to subsequently search the signaling channel for its UE-ID to see *if* a message intended for the UE actually exists there), in Vayanos the pre-assigned location of an active (multiple-bit) indicator informs a specific UE that a message intended for the UE *in fact exists* on the signaling channel at a location known *a priori* to the UE (eliminating the need for the UE to subsequently search the signaling channel for its UE-ID). Ex. 2001, ¶82.

The combination of Kim and Vayanos in the Petition *substitutes* the 288 paging indicator bits of Vayanos for the PICH of Kim, while at the same time *retaining* the aspects of Kim requiring a UE to check the paging channel (PCH) *based on the UE’s identifier* to see if there is a paging message for that particular UE. Pet., 38-40 and 54-56. Such an approach is illogical -- and a POSITA would not have been motivated to adopt it -- because the pre-assigned location of an active (multiple-bit) indicator in Vayanos by itself informs a specific UE that a message

intended for the UE in fact exists on the signaling channel at a location known *a priori* to the UE. Ex. 2001, ¶83. This technique eliminates the need for the UE to subsequently search the signaling channel based on the UE's identity, as claimed. The Petition has failed to explain why a POSITA would have been motivated to retain the aspects of Kim in which a UE checks the paging channel (PCH) based on the UE's identifier to see if there is a paging message for that particular UE, when the indicator techniques in Vayanos eliminated the need to do so. Ex. 2001, ¶83.

For this further reason, Ground 1 fails to demonstrate a reasonable likelihood of success with respect to independent Claims 1 and 7 of the '416 Patent.

C. Petitioner Has Interpreted “Broadcast Information” In These Proceedings In A Manner That Contracts Petitioner’s Construction Of That Term In The District Court

As explained in Section IV(C), *supra*, the Petition interprets “broadcast information” in a manner diametrically opposed to Petitioner’s position in district court. In the district court, Petitioner maintains that information transmitted to “a targeted group” of UE’s in the cell -- rather than all UE’s in the cell -- is not “broadcast information.” Ex. 2003, 25. However, the Petition relies on Kim for “broadcast information,” and in Kim the “broadcast information” is intended for “a specific paging group.” Ex. 1005, 1:38-46 (“Terminals are included in a specific paging group defined for an efficient paging procedure in a system. Therefore, the base station notifies that paging message arrives at terminals included in a

corresponding group through the paging indication channel”); *Id.*, 4:59-63 (“the base station sets up a paging indication channel 6 corresponding to the terminal or the terminal group indicated by the paging information and forms the paging indication channel 6 at step S140 such that the terminal in the system can be divided into groups.”) In Vayanos, the “specific paging group” is even more limited -- consisting of a single UE. Ex. 1006, 3:39-46.

In *Microchip Technology, Inc. v. Aptiv Technologies, AG*, 2024 Pat. App. LEXIS 3820, IPR2024-00558, Paper #12, at 10 (P.T.A.B. 2024), the Board denied institution where, as here, the Petition was based on “a claim construction that Petitioner opposes in the district court litigation and that Petitioner believes is incorrect.” Similarly, in *Comcast Cable Communications, LLC, v. Promptu Systems Corp.*, 2018 Pat. App. Lexis 9218, CBM2018-00033, Paper #9, at 9 (P.T.A.B. 2018), the Board denied institution where, as here, “Petitioner does not present an adequate explanation for the contradictory claim constructions.”

The rules place the burden on the Petitioner to set forth “[h]ow the challenged claim is to be construed.” 37 C.F.R. 42.104(b)(3). Given that petitioner’s mappings are based on a claim construction position that Petitioner opposes in the district and “believes to be incorrect,” Petitioner’s perfunctory statement that “no claim term requires express construction” is disingenuous and renders the Petition deficient.

For this further reason, Ground 1 fails to demonstrate a reasonable likelihood of success with respect to independent Claims 1 and 7 of the ‘416 Patent.

D. Ground 1 Fails To Demonstrate A Reasonable Likelihood Of Success With Respect To Any Challenged Claims

For the reasons set forth in Sections VIII(A)-(C), *supra*, Petitioner has failed to demonstrate a reasonable likelihood that independent claims 1 and 7 of the ‘416 Patent are unpatentable. The Petition’s proposed mappings do not establish that Kim or Vayanos disclose or suggest the claim limitation requiring reception of “a plurality of bits, wherein each of the plurality of bits indicates a respective time interval that physical shared channel resources are utilized to signal channels.” Instead, both the First Mapping and the Second Mapping fail to align with the claim language, as they either (i) rely on a many-to-one correspondence between multiple bits and a single time interval (as in Vayanos) or (ii) fail to establish that a plurality of bits is actually transmitted to the UE (as in Kim). The Petition provides no adequate explanation reconciling these deficiencies.

Furthermore, Petitioner has not provided a sufficient rationale for why a POSITA would combine Kim and Vayanos in a manner that meets the claim language. The claimed technique requires a two-step signaling process in which a UE first receives an indication of a relevant time interval and subsequently monitors that interval for signaling information. However, Vayanos pre-assigns indicator bits to specific UEs, eliminating the need for a subsequent search based on the UE’s

identity. The Petition does not explain why a POSITA would have been motivated to modify this arrangement in a way that reintroduces the need for the UE to search for its identifier.

Additionally, Petitioner's reliance on an inconsistent interpretation of "broadcast information" further renders the Petition deficient. In district court proceedings, Petitioner has taken the position that information sent to a targeted group of UEs does not constitute "broadcast information," yet the Petition relies on prior art references in which "broadcast information" is directed to a specific paging group or even a single UE. This inconsistency, coupled with Petitioner's failure to provide a consistent claim construction, renders the Petition defective under 37 C.F.R. § 42.104(b)(3).

For these reasons, Ground 1 fails to establish a reasonable likelihood of success in challenging independent Claims 1 and 7. Since the obviousness arguments in Ground 1 directed to the dependent claims of the '416 Patent are predicated on the deficient arguments challenging independent Claims 1 and 7 as discussed above, Ground 1 also fails to demonstrate a reasonable likelihood of success with respect to any of the dependent claims of the '416 Patent.

IX. GROUND 2 FAILS TO DEMONSTRATE A REASONABLE LIKELIHOOD OF SUCCESS ON THE MERITS

Ground 2 is substantially similar to Ground 1. However, Ground 2 combines Kim and Vayanos with the so-called Applicant Admitted Prior Art (AAPA), and

relies on the AAPA in connection with elements [1.1] and [1.4]. Significantly, Ground 2 does not rely on the AAPA to cure any of the deficiencies in Ground 1 with respect to elements [1.2] and [1.3] articulated in Section VIII, *supra*. Thus, for the same reasons explained above in connection with Ground 1, Ground 2 fails to demonstrate a reasonable likelihood of success with respect to any of the Challenged Claims. Ex. 2001, ¶85.

X. INSTITUTION SHOULD BE DENIED UNDER THE FINTIV FACTORS

On April 15, 2024, Petitioner was served with a Complaint filed by Patent Owner alleging infringement of the ‘416 Patent in *Intellectual Ventures II LLC v. Tesla, Inc.*, WDTX-1:24-cv-884 (the “Parallel Litigation.”) Ex. 2004, 6. Petitioner waited over 7 months until November 21, 2024 to file the present IPR. As a result, the Parallel Litigation has already advanced substantially. For example, Patent Owner served Preliminary Infringement Contentions on August 1, 2024, Petitioner served Preliminary Invalidity Contentions on October 24, 2024, the parties exchanged claim terms for construction on November 14, 2024, the parties exchanged proposed claim constructions on December 5, 2024, the parties disclosed extrinsic evidence with respect to claim construction on December 12, 2024, Petitioner filed its Opening Claim Construction Brief on January 9, 2025, Patent Owner filed its Responsive Claim Construction Brief on February 10, 2025,

Petitioner filed its Reply Claim Construction Brief on March 3, 2025. Ex. 1011, 1-2.

By the anticipated date of the Institution Decision in this matter (June 12, 2025), Patent Owner is scheduled to have filed its Sur-Reply Claim Construction Brief (March 24, 2025), the parties are scheduled to have submitted technical tutorials to the Court (March 31, 2025), the Court will have held the Markman Hearing (scheduled for April 10, 2025), the parties will be well into fact discovery (which opens April 11, 2025), the parties will have served Final Infringement and Invalidity Contentions (due May 22, 2025), and the Court will in all likelihood have issued its claim construction ruling. Ex. 1011, 2-3. The Trial is scheduled for May 14, 2026, about 1 month before the statutory deadline for issuing a Final Written Decision in this matter on June 12, 2026. Ex. 1011, 4.

The precedential order in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (“*Fintiv*”) identifies six factors for the Board to consider in deciding whether to exercise discretion to deny institution based on parallel proceedings involving the same patent. As discussed below, application of the present facts to these factors demonstrates that there are strong reasons for exercising discretion to deny institution here.

A. Factor 1 Weighs Against Institution Because A Stay Has Not Been Granted In The Parallel Litigation And There Is No Evidence That A Stay Would Be Granted If This IPR Was Instituted

No stay has even been requested in the Parallel Litigation. In addition, even if this IPR was instituted (which would not occur until on or around June 12, 2025) it is unlikely that the Court (Judge Albright) would grant a stay. *See, generally, Continental Intermodal Grp. v. Sand Revolution LLC*, No. 7:18-cv-00147 (W.D. Tex. July 22, 2020) (Judge Albright) *Multimedia Content Mgmt. LLC v. Dish Network*, No. 6:18-CV-00207-ADA, 2019 U.S. Dist. LEXIS (W.D. Tex. May 30, 2018) (Judge Albright) (denying stay).

Thus, the first factor weighs against institution.

B. Factor 2 Weighs Against Institution Because The Parallel Litigation Has A Trial Date Scheduled Before The Projected Statutory Deadline For The Board's Final Written Decision

As noted above, the Trial is scheduled for May 14, 2026, about 1 month before the statutory deadline for issuing a Final Written Decision in this matter on June 12, 2026. Rather than looking at the actual date trial is scheduled, the Petition relies on the median time from filing to case disposition in the Western District of Texas. However, on February 28, 2025, the Office *rescinded* former Director Vidal's 2022 memorandum on discretionary denials which had directed that such statistics be considered. The announcement rescinding former Director Vidal's 2022 memorandum went on to state that decisions relying on the 2022 memo will be

“neither binding or persuasive on the PTAB.” In view of the above, Petitioner’s arguments based on the time to trial statistics cannot be considered persuasive and must be rejected.

Given that the actual trial date is before the due date for the Final Written Decision, the second factor favors discretionary denial.

C. Factor 3 weighs against institution because the parties will have invested significant effort in the Parallel Litigation by the time the Board’s institution decision is due

Factor 3 relates to investment in the Parallel Litigation by the court and the parties. *Fintiv*, Paper 11 at 9. This factor is judged from the date of the institution decision, which is expected to be no later than June 12, 2025. *Id.* As noted above, the parties in the Parallel Litigation will have completed all of the following by the time the Board’s institution decision is due:

- PO’s Preliminary Infringement Contentions (served August 1, 2024);
- Petitioner’s Preliminary Invalidity Contentions (served October 24, 2024);
- Parties exchanged claim terms for construction (November 14, 2024);
- Parties exchanged proposed claim constructions (December 5, 2024);
- Parties disclosed extrinsic evidence for claim construction (December 12, 2024);
- Petitioner’s Opening Claim Construction Brief (January 9, 2025);
- PO’s Responsive Claim Construction Brief (February 10, 2025);

- Petitioner’s Reply Claim Construction Brief (March 3, 2025);
- PO’s Sur-Reply Claim Construction Brief (March 24, 2025);
- Parties technical tutorials submitted to Court (March 31, 2025);
- Markman Hearing (scheduled for April 10, 2025);
- Fact discovery (opens April 11, 2025); and
- Final Infringement and Invalidity Contentions (due May 22, 2025).

Ex. 1011, 1-3. Clearly, the parties and the Court will have made a substantial investment in the Parallel Litigation by the expected date of the institution decision on June 12, 2025.

Thus, the third factor weighs against institution.

D. Factor 4 weighs against institution because there is substantial overlap between the Parallel Litigation and this IPR

In Invalidity Contentions in the Parallel Litigation (an excerpt of which is reproduced below), Petitioner relies on Kim, Vayanos and the so-called AAPA.

H. The '416 Patent

1. Prior Art Patents and Patent Publications

Ex. No.	Patent/ Publication	Referenced As	Publication / Priority Date
H1	U.S. Pat. No. 8,761,814	Kim 814	April 24, 2007
H2	U.S. Pat. No. 8,144,735	Vayanos	February 10, 2004
H3	U.S. Pat. App. Pub. No. 2010/0,234,032	Chun	March 28, 2006
H4	U.S. Pat. App. Pub. No. 2008/0,207,229	Cave	March 16, 2007
H5	U.S. Pat. No. 8,351,392	Ahn	August 14, 2007
H6	U.S. Pat. No. 8,027,297	Kim 297	June 13, 2007
H7	U.S. Pat. No. 9,717,073	Yamada	October 2, 2006
H8	U.S. Pat. No. 9,088,932	Lee	October 25, 2006

Ex. 2005, at 26; see also Ex. 2005, 149-166.

Because there will be significant overlap between this IPR and the Parallel Litigation, there are particularly strong “concerns of inefficiency and the possibility of conflicting decision” if this IPR is instituted. *Fintiv*, Paper 11 at 12.

Thus, the fourth factor weighs against institution.

E. Factor 5 weighs against institution because the patent owner is the same and the Petitioner are the same parties as in the Parallel Litigation

Patent Owner and Petitioner are the same parties as in the Parallel Litigation.

Thus, the fifth factor weighs against institution.

F. Factor 6 weighs against institution because there are no other circumstances that favor institution, and the merits of Petitioner’s challenge is weak

As discussed above, Petitioner’s challenge is weak. Moreover, the fact that the Petition relies on “a claim construction that Petitioner opposes in the district

court litigation and that Petitioner believes is incorrect” provides a further reason for discretionary denial. *Microchip Technology*, IPR2024-00558, Paper #12, at 10. In the event the district court accepts the claim construction position urged by Petitioner in the district court, there will be a significant possibility of inconsistent outcomes were these proceedings to move forward with a claim construction that Petitioner successfully urged the district court to reject. The possibility of such inconsistent outcomes favors discretionary denial.

Thus, the sixth factor weighs against institution.

All of the *Fintiv* factors weigh against institution of the IPR. Under §314(a) and, based on the totality of the *Fintiv* factors, institution should be denied.

XI. CONCLUSION

Petitioner has not met its burden of showing that the cited references, alone or in combination with the other references, disclose, teach or suggest all of the limitations of the Challenged Claims of the ‘416 Patent. The Board should therefore deny institution of the Petition.

Respectfully submitted,

Dated: March 12, 2025

By: /Daniel H. Golub/
Daniel H. Golub
Registration No. 33,701

*Counsel for Patent Owner
Intellectual Ventures II LLC*

CERTIFICATE OF COMPLIANCE WITH WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), I certify that this Response complies with the type-volume limits of 37 C.F.R. § 42.24(b)(1) because it contains 12,437 words, excluding the parts of this Patent Owner's Preliminary Response that are exempted by 37 C.F.R. § 42.24(a), according to the word processing system used to prepare this Patent Owner's Preliminary Response.

Respectfully submitted,

Dated: March 12, 2025

By: /Daniel H. Golub/
Daniel H. Golub
Registration No. 33,701

*Counsel for Patent Owner
Intellectual Ventures II LLC*

CERTIFICATE OF SERVICE

The undersigned certifies that pursuant to 37 C.F.R. § 42.6(e), a copy of the foregoing **PATENT OWNER'S PRELIMINARY RESPONSE** was served via email (as consented to by counsel) on March 12, 2025 to lead and backup counsel of record for Petitioner as follows:

Scott T. Jarratt
Haynes and Boone, LLP
2801 N. Harwood Street, Suite 2300
Dallas, TX 75201
scott.jarratt.ipr@haynesboone.com

Calmann J. Clements
Haynes and Boone, LLP
2801 N. Harwood Street, Suite 2300
Dallas, TX 75201
calmann.clements.ipr@haynesboone.com

Jonathan R. Bowser
Haynes and Boone, LLP
2801 N. Harwood Street, Suite 2300
Dallas, TX 75201
jon.bowser.ipr@haynesboone.com

Paul Margulies
Tesla, Inc.
1 Tesla Road
Austin, TX 78725
pmargulies@tesla.com

Dated: March 12, 2025

By: /Daniel H. Golub/
Daniel H. Golub
Registration No. 33,701
Counsel for Patent Owner
Intellectual Ventures II LLC