

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC, CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS, T-MOBILE USA, INC., AT&T SERVICES, INC., NOKIA OF AMERICA, CORP.,
AND ERICSSON INC.

Petitioners

v.

KT CORPORATION (Patent Owner) and
PEGASUS WIRELESS INNOVATION LLC (Exclusive Licensee)

Case No. IPR2025-00292

Patent 9,894,644

**PETITIONERS' REPLY TO PATENT OWNER'S
PRELIMINARY RESPONSE**

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This Reply is responsive to Patent Owner’s Preliminary Response (Paper 13, “POPR”). The Board authorized filing this Reply in its email dated June 2, 2025.

I. ANALYSIS

The Petition presents compelling evidence of invalidity. PO challenges the Petition’s analysis of receiving configuration information including information on a start subframe through higher layer signaling. As detailed below, Lee (EX1006) teaches transmitting a bitmap through higher layer signaling that contains start subframe information, and You (EX1007) and Zhang (EX1016) further render obvious transmitting such information via higher layer signaling.

A. Lee Discloses or Renders Obvious Configuration Information Including a Start Subframe Through Higher Layer Signaling

The Petition explains that Lee discloses configuration information including a “bitmap.” Pet., 22 (citing EX1006 at ¶[0111]). PO does not appear to dispute that this bitmap is configuration information relating to a plurality of subframes, or that it is transmitted/received via higher layer signaling. Nor can it. As the Petition makes clear, Lee’s bitmap is configuration information at least because it contains information indicating how subframes in a window are configured, including “window size ... and/or the subset of subframes for TTI bundling.” *Id.* Likewise, the Petition explains that Lee’s bitmap is “informed via higher layer signaling.” *Id.*

As explained in the Petition, Lee depicts an example of a bitmap in Figure 9 that includes information on a start subframe of the plurality of subframes. Pet., 26-

27 (citing EX1006 at Figure 9). The Petition includes an annotation of Lee Figure 9 showing the information on the start subframe:

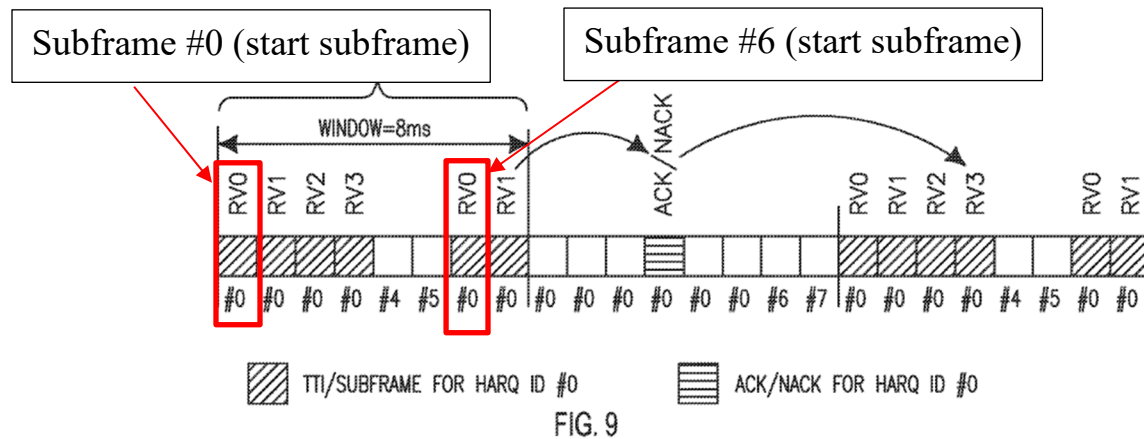


Fig. 9 of Lee (Annotated)

Pet., 27. As shown above, Lee's bitmap includes information on the subset of subframes that are used for TTI bundling—including the start subframes for each subset, designated RV0. *Id.* (citing EX1006, ¶¶[0111]-[0122]).

Figure 9 of the '644 Patent corresponds to Lee's Figure 9:

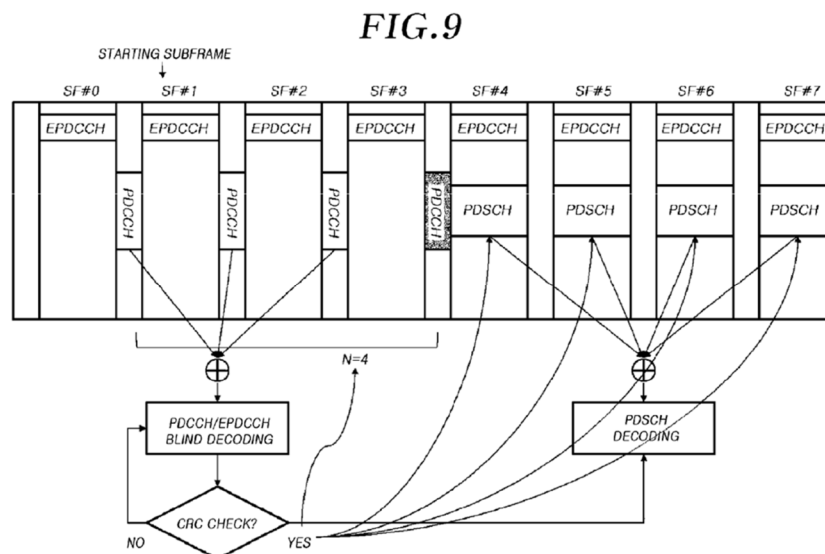


Fig. 9 of the '644 Patent

As shown above, Figure 9 of the '644 Patent shows repeated subframes including subframes "SF#1" to "SF#4", where "SF#1 is set as a start subframe, through higher layer signaling". EX1001, 12:33-34. Pet., 12, 27-28. Similarly, Lee's Figure 9 clearly shows two subframes both labeled as "#0" in the first window that are start subframes, identical to "SF#1" in Figure 9 of the '644 Patent. *Id.*

Though evident from Figure 9, PO argues against Lee's bitmap on the ground that "the number of repeated subframes in a TTI bundle" would also be needed to "know" the number of start points. PO errs on multiple grounds.

First, PO's arguments improperly focus on a separate DCI transmission. Whether or not "the number of repeated subframes in a TTI bundle" is separately transmitted is not relevant to whether Lee's bitmap, illustrated in Figure 9, contains "information on a start subframe." Lee plainly states that "the subset of subframes for TTI bundling may be indicated by using a bitmap... and the bitmap may be informed via higher layer signaling." Pet., 26 (citing EX1006, ¶[0111]). Thus, Lee's bitmap satisfies the claim regardless of whether Lee separately transmits "the number of repeated subframes in a TTI bundle."

Second, PO relies on an incorrect meaning of "start subframe." The '644 Patent discloses that information on a start subframe is "a value of a particular subframe index (or subframe number) indicating a start point" and "the information indicating the subframe index [*e.g., of a start subframe*] may be a bitmap." Pet., 26-

28 (citing EX1001, 10:2-22). Figure 9 of Lee depicts a bitmap of TTI bundling indications, including values RV0 for start subframes. Pet., 27. No more is required.

Third, this feature would have been obvious in view of Lee. In Ground 2, the Petition confirms that “[a] POSITA would have been motivated in view of Lee to transmit the start of the subframe repetitions (e.g., a bitmap) via higher layer signaling in the configuration information ... so that the UE knows where/when to find the repeated (E)PDCCHs.” Pet., 39 (citing EX1006, ¶¶[0128]). Lee clearly explains that it was known to transmit information “through a higher layer.” See, EX1006, ¶¶[0111]-[0128]; EX1010, ¶¶[0105]-[0122]. Thus, even if Lee’s bitmap did not expressly include information on a start of subframes, the Petition sets forth a sufficient basis to conclude that this element of claim 1 would have been obvious.

B. The Modification of Lee Based on You and Zhuang Does Not Rely on Impermissible Hindsight

PO does not appear to dispute that You and/or Zhuang disclose the claim elements that it contends are absent from Lee. Instead, PO attacks Ground 3 on the incorrect premise that it is “based on impermissible hindsight.” PO is mistaken, as Ground 3 relies on explicit motivations in the references themselves.

The Petition notes that “Lee recognizes a need for enhancing coverage of MTC UE devices....” Pet., 45 (citing EX1006, ¶¶[0003]-[0005]). You addresses this need directly by “describe[ing] a mechanism for enhancing coverage of MTC devices, for example, by repeatedly allocating downlink control channels (PDCCHs)

in a plurality of subframes.” *Id.* (citing EX1007, ¶[0145]). Zhuang discloses “coverage improvement and cost reduction for [] MTC devices in coverage hole scenario[s],” including “repetition of the physical channels to improve the coverage.” Pet., 46-47 (citing EX1016, 1:14-16). The references thus explicitly recognize the potential for subframe repetition to improve coverage for MTC devices.

PO further errs by suggesting that the combination would “obviate” Lee’s teaching of element [1.5]. PO is mistaken. Lee teaches a “new DCI format ... used to carry ‘indication bits; for dynamic configuration of a UE (e.g., WTRU) using dynamic subframe bundling.” Pet., 58 (citing EX1006, ¶[0114]). By contrast, You does not disclose using dynamic subframe bundling. Thus, a POSITA would not have had any reason or motivation to jettison the new DCI format of Lee. *Id.* See EX1006, ¶¶[0111]-[0115]; EX1010, ¶¶[0105]-[0109]. This is further confirmed by Zhuang, which recognized that “it is important to have a method to determine the start subframe of the physical channels.” Pet., 47-48 (citing EX1016, 1:21-22).

Pursuant to the Director’s Memorandum dated March 26, 2025, Petitioners explained why discretionary denial is inappropriate in their Opposition to Patent Owner’s Request for Discretionary Denial filed June 5, 2025.

II. CONCLUSION

Petitioners have shown a reasonable likelihood of success on the merits. Therefore, the Board should institute trial.

Date: June 16, 2025

Respectfully submitted,

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APPENDIX A - LIST OF EXHIBITS

Exhibit No.	Description
1001	U.S. Patent No. 9,894,644, issued on February 13, 2018 (“the ‘644 Patent”)
1006	PCT International Publication No. WO 2014/055878, published on April 10, 2014 (“Lee”)
1007	U.S. Patent Publication No. 2016/0353420, published on December 1, 2016 (“You”)
1010	U.S. Provisional Patent Application No. 61/863,223, filed August 7, 2013 (“Lee Priority Application”)
1016	PCT International Publication No. WO 2015/018075, filed August 9, 2013 and published on February 12, 2015 (“Zhuang”)

CERTIFICATE OF SERVICE

The undersigned hereby certifies that on this 16th day of June, 2025, a true and correct copy of the foregoing **PETITIONERS' REPLY TO PATENT OWNER'S PRELIMINARY RESPONSE** is being served via electronic mail upon counsel for Patent Owner as follows:

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