

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AT&T MOBILITY LLC, AT&T SERVICES INC., ERICSSON INC., NOKIA OF
AMERICA CORPORATION, AND T-MOBILE USA, INC.,
Petitioners,

v.

DAINGEAN TECHNOLOGIES LTD.,
Patent Owner.

Case IPR2024-00730
Patent 11,196,509

**PATENT OWNER'S PRELIMINARY RESPONSE UNDER 37
C.F.R. § 42.107 TO PETITION FOR *INTER PARTES* REVIEW**

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EXHIBIT LIST

Exhibit	Description
EX2001	Declaration In Support of Motion For Pro Hac Vice Admission of Eric Enger

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I. Introduction

Patent Owner Daingean Technologies Ltd. (“Daingean” or “Patent Owner”) respectfully requests that the Board refuse to institute *inter partes* review of U.S. Patent No. 11,196,509 (“the ’509 Patent”) because Petitioners AT&T Mobility LLC, AT&T Services Inc., Ericsson Inc., Nokia of America Corporation, and T-Mobile USA, Inc. (collectively “Petitioners”) have not shown a reasonable likelihood of prevailing on their challenge to Claims 4, 5, 10, and 11 of the ’509 Patent (the “Challenged Claims”). *See* Pet. at 5.

Petitioners identified nothing in either Lee (Ground 1) or Zheng (Ground 2) that teaches all limitations of the Challenged Claims. In the absence of such teachings, Petitioners rely on boilerplate statements and improper hindsight gleaned from the ’509 Patent in an attempt to modify those deficient teachings. Yet even Petitioners’ hindsight driven challenges fail to teach or render obvious all Challenged Claim limitations. Therefore, Petitioners have failed to present a reasonable likelihood of success on any ground and the Petition should be denied.

II. Background

A. The ’509 Patent

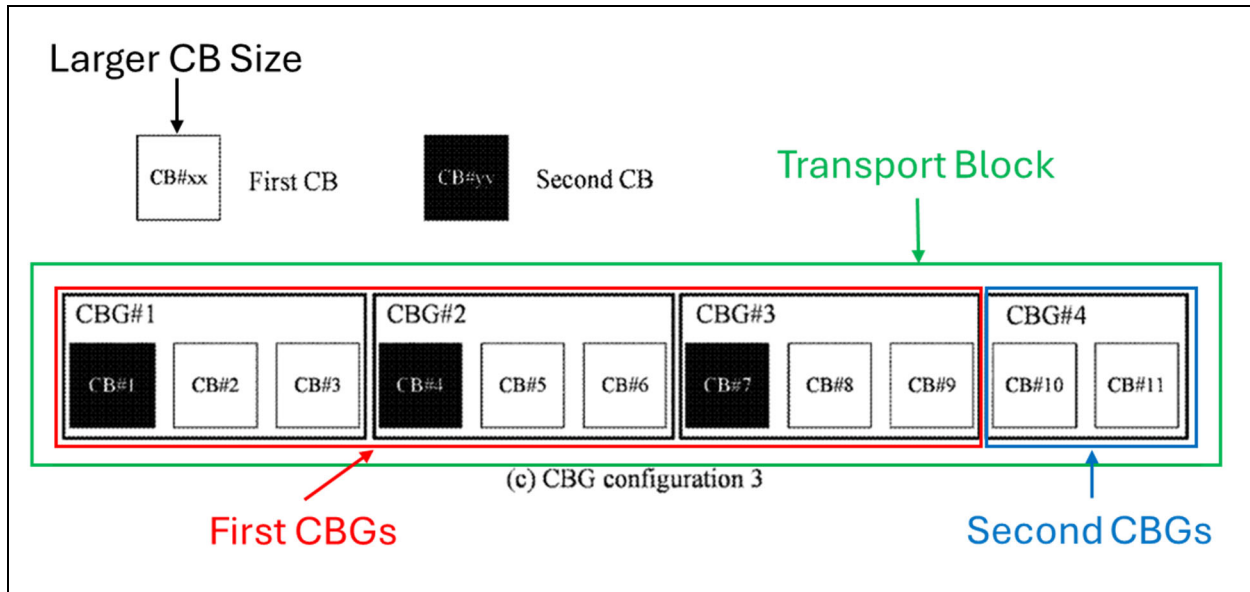
The ’509 Patent is titled “Terminal Apparatus, Base Station Apparatus, and Communication Method.” The ’509 Patent was filed as a Japanese PCT Application

on May 23, 2018, and claims priority to a Japanese Patent Application filed June 13, 2017.

The '509 Patent discloses handsets and base stations “capable of efficiently performing uplink and/or downlink communication.” EX1001 at 1:53-61, 5:48-51. More specifically, it teaches subdividing a Transport Block (“TB”) of data into multiple Code Blocks (“CBs”) and then grouping those CBs into Code Block Groups (“CBGs”). *Id.* at 1:66-5:45. The '509 Patent teaches techniques that allow the CBs and CBGs to be arranged in different sizes. *Id.* This subdividing and grouping process allows the Hybrid Automatic Repeat Request (“HARQ”) acknowledgement (“ACK”) procedure to be performed on a more granular basis. *Id.* Instead of performing HARQ-ACK on an entire TB basis (*e.g.*, sending a negative-acknowledgement “NACK” signal corresponding to the entire TB, which requires retransmitting the entire TB when just a single CBG within that TB is not properly received), the '509 Patent’s approach enables the option of performing HARQ on a CBG basis (*e.g.*, sending a NACK signal with a bit corresponding to each CBG so that when just one CBG is not properly received, only that CBG is retransmitted). *Id.*; *see also id.* at 7:64-8:3, 35:40-62.

To best utilize the more granular HARQ-ACK, the '509 Patent teaches that the CBs should be segmented/grouped depending on factors such as the size and number of the CBs. The '509 Patent inventors determined that when there is a

“significant difference in the number of bits” included in certain CBGs, this can lead to “deterioration of resistance to burst errors,” which is a problem “specific to wireless channels.” EX1001 at 23:14-21, 24:24-28. Annotated Figure 11c illustrates a preferred embodiment with a solution to this issue:



EX1001 Fig. 11c (cropped and annotated).

As shown in the annotated figure, the TB is subdivided into 11 CBs (CB#1 to CB#11), and those CBs are grouped into four CBGs (CBG#1 to CBG#4). See EX1001 at 23:7-14. The CBs have two different sizes: a larger First CB size, colored white, and a smaller Second CB size, colored black. *Id.* at 23:4-10. And the different CBGs can be arranged with different numbers of code blocks within them: CBGs#1-3 have a first size with three CBs each (red box), while CBG#4 has a second size with only two CBs (blue box). The CBs are segmented such that the CBs of different sizes (e.g., both First CBs and Second CBs) may be included in any of the CBGs.

Id. at 23:31-36. In this embodiment, the First CBGs (red box) have more of the Second CBs than the Second CBG (blue box). Segmenting the CBGs in this way (1) helps maintain resistance to burst errors by minimizing the difference in the number of bits included in the CBGs, and (2) facilitates the use of HARQ-ACKs on a more granular basis.

The Challenged Claims cover this and other embodiments taught by the '509 Patent. For example, '509 Patent Claim 4, which is similar to Claim 10, recites:¹

[4pre] A base station apparatus comprising:

[4a] a coding unit configured to segment a transport block into multiple CBs and to code each of the multiple CBs;

[4b] a transmitter configured to transmit the transport block, and

[4c] a receiver configured to receive HARQ-ACKs corresponding to multiple CBGs, wherein

[4d] the multiple CBs include one or more first CBs and one or more second CBs,

[4e] a first size of a first CB of the one or more first CBs is greater than a second size of a second CB of the one or more second CBs,

[4f] each of the multiple CBs is included in any one of the multiple CBGs,

[4g] the multiple CBGs include one or more first CBGs and one or more second CBGs,

¹ This Preliminary Response uses the same limitation labels used in the Petition at iv-vi.

[4h] a first total number of the one or more first CBs and the one or more second CBs included in each of the one or more first CBGs is greater than a second total number of the one or more first CBs and the one or more second CBs included in each of the one or more second CBGs, and

[4i] a first CBG of the one or more first CBGs includes a greatest number of the one or more second CBs.

The '509 Patent also teaches other variations on these transport block segmentation techniques, such as segmenting so that “an average value of numbers of the one or more second CBs included in the one or more second CBGs is greater than an average value of numbers of the one or more second CBs included in the one or more first CBGs.” *See, e.g.,* EX1001 at 3:28-32, 4:23-26, 5:17-21, 42:58-62, 43:53-57; *see also* 48:54-58 (Claim 5), 51:11-15 (Claim 11). These additional segmentation approaches provide further flexibility as to how the CBs and CBGs can be structured by the base station.

B. Petitioners' References

1. Lee [EX1005]

Lee is U.S. Patent Application Publication No. 2019/0327024 titled “SYSTEMS, METHODS AND DEVICES FOR MEETING CELLULAR DATA TURNAROUND TIME.” EX1005 Cover. The reference's teachings relate to turnaround time, which it explains can be “[t]he time between end of data signal and transmission of acknowledgement,” or “the time between reception of the last bit of

an uplink transmission and scheduling of a retransmission of the same packet by a scheduler.” *Id.* ¶¶31, 33. It notes a need to balance overall turnaround time against competing factors like complexity, chip area cost, additional processing, and supported data rate. *Id.* ¶¶30-32. To accomplish those goals, Lee teaches various segmentation approaches. However, unlike the ‘509 Patent, Lee recognizes neither the problem of burst errors, nor the risk associated with having a significant difference in the number of bits included in various CBGs. As a result, Lee fails to disclose any segmentation approach that could teach or render obvious the claimed segmentation limitations from the ‘509 Patent (*e.g.*, claim limitations [4d]-[4i]). Recognizing this, Petitioners rely on boilerplate language in Lee suggesting that other (undisclosed) arrangements are possible, and use that boilerplate language as an excuse to modify Lee based on hindsight gleaned from the ‘509 Patent. As a result, Petitioners’ Ground 1 based on Lee is deficient and does not present a reasonable likelihood of prevailing against any Challenged Claim.

2. Zheng [EX1007]

Zheng is U.S. Patent Application Publication No. 2019/0173499 titled “INFORMATION PROCESSING METHOD, DEVICE, AND COMMUNICATIONS SYSTEM.” EX1007 Cover. Zheng suggests it relates to the problem of “[h]ow to process an information sequence to meet a channel coding requirement, so as to improve system coding performance and decoding

performance.” EX1007 ¶5. While Zheng discusses segmentation at a high level, it fails to disclose any embodiment which teaches or renders obvious the Challenged Claims. In fact, Zheng is so unconcerned with the segmentation approaches recited in the Challenged Claims that many of the Zheng embodiments Petitioners rely on identify neither the size of the CBs, nor even how many CBs are in any particular CBG. Petitioners are intentionally vague when discussing those examples, failing to even map the Challenged Claim language onto the asserted Zheng embodiments. Ultimately, Zheng considers neither the same problems nor the claimed solutions of the ’509 Patent, and as a result Zheng does not present a reason reasonable likelihood of prevailing against any Challenged Claim.

III. Legal Standards

An IPR should not be instituted unless the Petitioner has shown a likelihood of success on the invalidity grounds presented in the petition. *See In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1381 (Fed. Cir. 2016) (“[T]he Board must base its decision on arguments that were advanced by a party, and to which the opposing party was given a chance to respond.”).

“In an IPR, the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (petitions must identify “with particularity . . . the evidence that supports the grounds for the challenge to each

claim” (quoting 35 U.S.C. § 312(a)(3))). This burden of persuasion never shifts to the patent owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

“To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.” *In re Magnum Oil Tools Int’l*, 829 F.3d at 1380.

IV. Level of Ordinary Skill in the Art

For purposes of this Preliminary Response, Patent Owner does not contest Petitioner’s recitation of the level of skill in the art because, even under Petitioner’s proposed level of skill, Petitioner has failed to demonstrate a reasonable likelihood of prevailing against any Challenged Claim.² *See* Pet. at 5.

V. Claim Construction

Claims are construed according to *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*). *See* 37 C.F.R. § 42.100 (b). Petitioner suggests that “the Board need not expressly construe any term” in this proceeding. Pet. at 4. For purposes of this Preliminary Response, Patent Owner does not propose any constructions

² Patent Owner reserves the right to propose its own definition of a person of ordinary skill in the art if the Petition is instituted.

because the Petition fails to present a reasonable likelihood of success of invalidating any Challenged Claims under any reasonable claim interpretation.³

VI. Argument

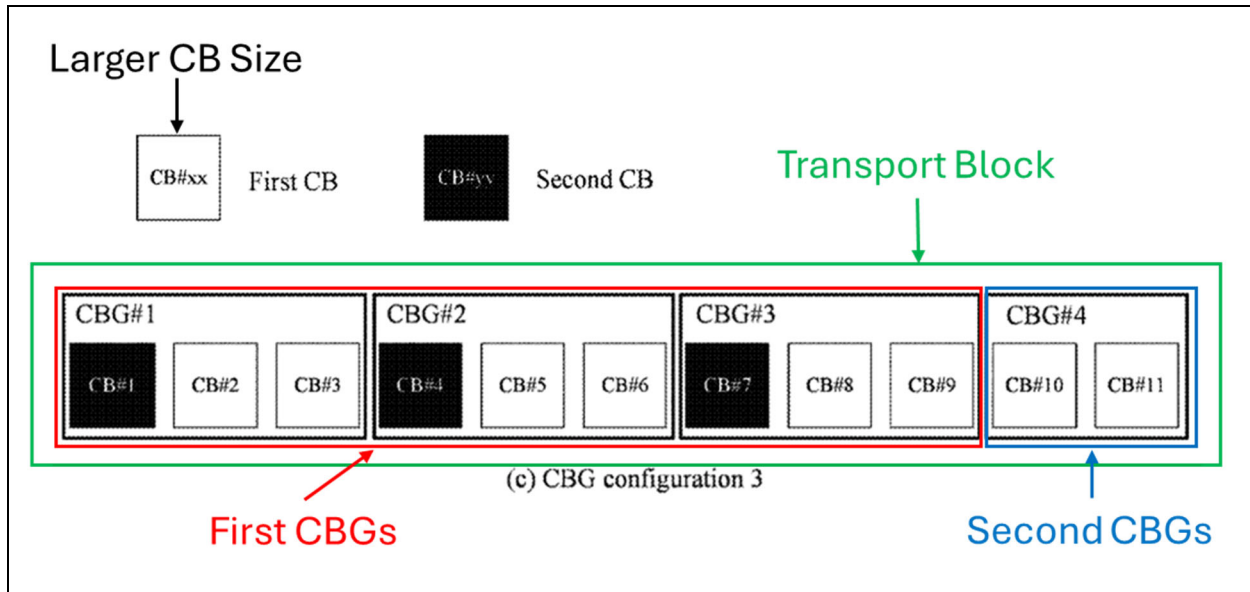
A. Ground 1: Lee

As discussed above in Section II.B.1, Lee recognizes neither the problem of burst errors, nor the risk associated with having a significant difference in the number of bits included in various CBGs—some of the core problems addressed by the '509 Patent. As a result, Lee fails to disclose any segmentation approach which could teach or render obvious the claimed segmentation limitations. The '509 Patent not only requires CBs of different sizes, but also that the larger or smaller CBs be grouped and segmented in specific ways. The '509 Patent teaches that segmenting transport blocks in a specific manner increases resistance to burst errors. *See, e.g.*, EX1001 at 23:14-21. Lee does not even consider the same problem, much less teach or render obvious the specific segmentation approaches in the Challenged Claims.

All Challenged Claims require (1) a first size of a first CB is greater than a second size of a second CB, (2) a first total number of the one or more first CBs and the one or more second CBs included in each of the one or more first CBGs is greater than a second total number of the one or more first CBs and the one or more second

³ Patent Owner may propose its own constructions if the Petition is instituted.

CBs included in each of the one or more second CBGs, and (3) the capability to include one or both first CBs and second CBs within any one of the CBGs. *See* '509 Patent Claim limitations 4e/5e/10e/11e, 4h/5h/10h/11h, 4f/5f/10f/11f. This is shown in the preferred embodiment of annotated Figure 11(c):



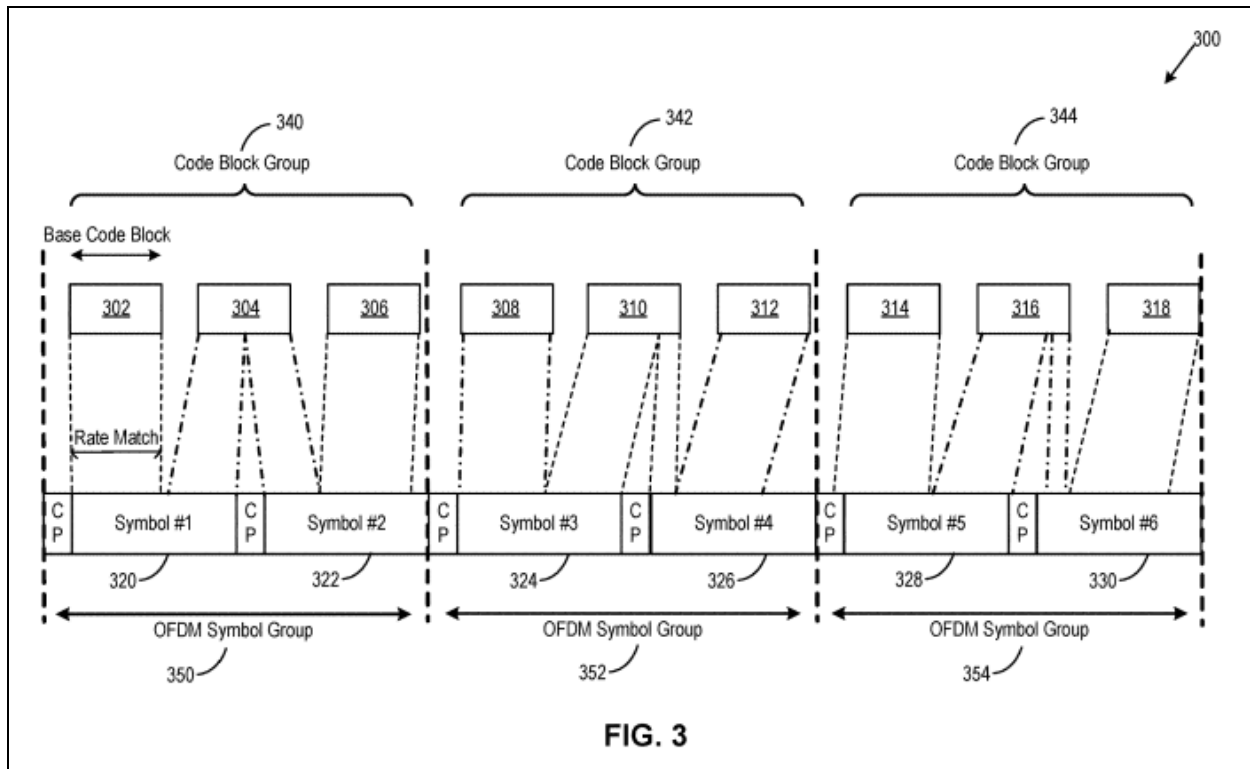
EX1001 Fig. 11c (cropped and annotated).

Furthermore, Claims 4 and 10 require a first CBG to include the greatest number of the smaller second CBs, and Claims 5 and 11 require an average value of numbers of the second CBs included in the second CBGs to be greater than an average value of numbers of the second CBs included in the first CBGs. *See* '509 Patent Claim limitations 4i/5i/10i/11i.

Petitioners addressed limitations [4d]-[4i] and [5d-5i], Pet. at 24-42, citing Lee Figures 3-5 and paragraphs 39 and 42 as purportedly teaching these limitations or rendering them obvious. *See also* Pet. at 46, 48 (citing the same for limitations

[10d]-[10i] and [11d]-[11i]). Yet neither the cited portions of Lee—nor Petitioners proposed modifications to the teachings of Lee—present a reasonable likelihood of invalidating any Challenged Claim.

1. Lee Figure 3



EX1005 Fig. 3.

Lee Figure 3 (shown above) fails to teach or render obvious the Challenged Claims, at least because: (1) each CBG has the same number of CBs, and (2) there is no indication of CB size. Accordingly, Petitioners cannot show which (if any) CBGs have a greater number of larger/smaller CBs, or that the base station is capable of segmenting CBs of different sizes into any one of the multiple CBGs.

First, '509 Patent Claim limitations 4h/5h/10h/11h recite “a first total number of the one or more first CBs and the one or more second CBs included in each of the one or more first CBGs is greater than a second total number of the one or more first CBs and the one or more second CBs included in each of the one or more second CBGs.” However, each CBG in Lee Figure 3 has the same number of CBs, with 3 CBs each—CBG 340: [CBs 302, 304, 306], CBG 342: [CBs 308, 310, 312], and CBG 344: [CBs 314, 316, 318]. Therefore, there is no CBG with a greater total number of CBs, as claimed.

Second, limitations 4e/5e/10e/11e,⁴ 4f/5f/10f/11f,⁵ 4i/10i,⁶ and 5i/11i⁷ all identify specific requirements regarding how the larger first CBs and smaller second CBs can be segmented. However, Petitioners did not even attempt to map the CBs

⁴ “a first size of a first CB of the one or more first CBs is greater than a second size of a second CB of the one or more second CBs”

⁵ “each of the multiple CBs is included in any one of the multiple CBGs”

⁶ “a first CBG of the one or more first CBGs includes a greatest number of the one or more second CBs”

⁷ “an average value of numbers of the one or more second CBs included in the one or more second CBGs is greater than an average value of numbers of the one or more second CBs included in the one or more first CBGs”

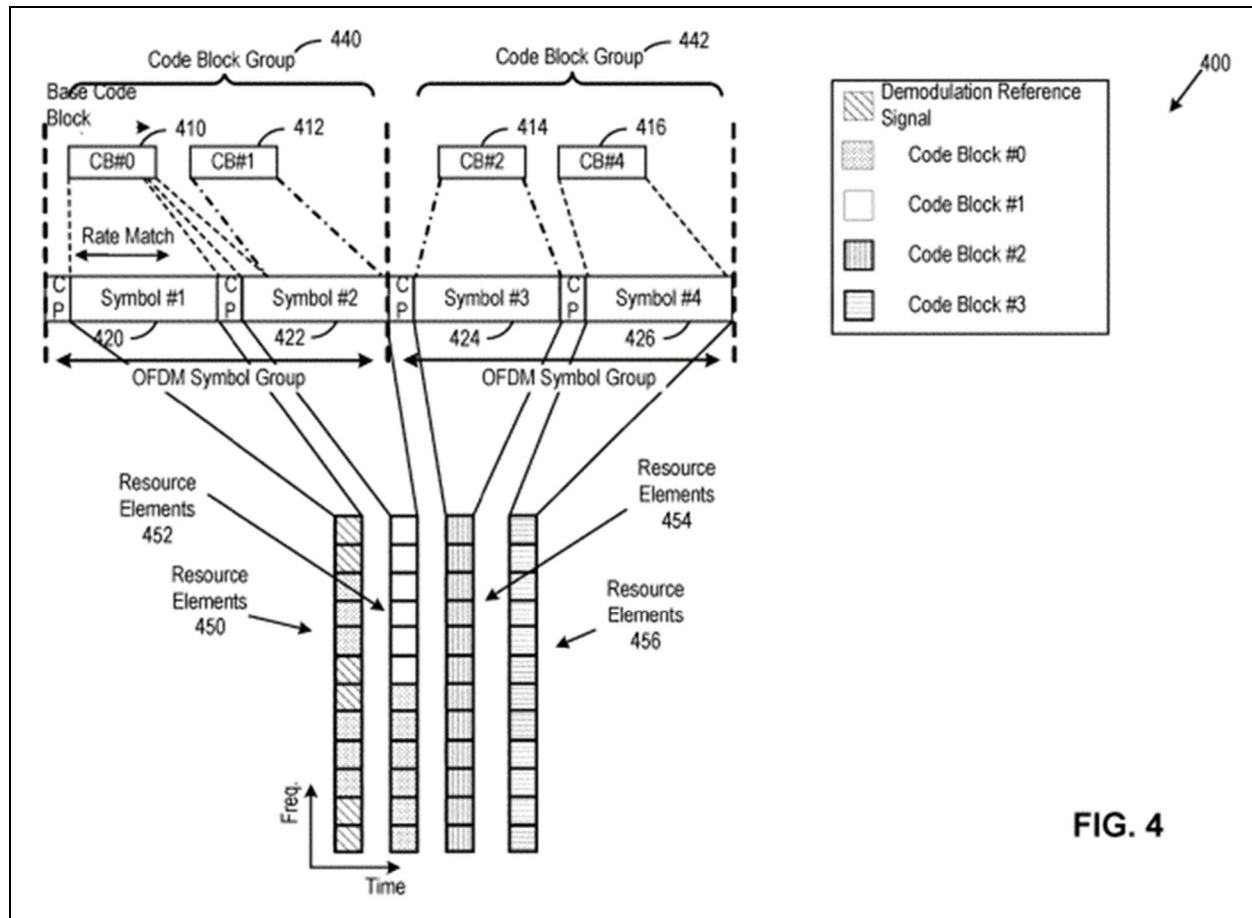
in Lee Figure 3 to the first or second CBs. Nor could they—Lee does not identify the size of the CBs in each CBG in Figure 3, so it is not possible for Lee to teach or render obvious those limitations, which rely on that size difference. *See* EX1005 Figure 3; *see also id.* ¶39.

Furthermore, in the absence of discussion of actual sizes in the specification, any speculative analysis based on the estimated sizes of the CBs shown in Lee Figure 3 cannot be used to challenge the claimed CBs (which require the ability to determine whether one CB is larger than another CB), and the claimed base station (which must be capable of segmenting CBs of different sizes into any one of the multiple CBGs). *See* MPEP §2125 (“[I]t is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue.” (quoting *Hockerson-Halberstadt, Inc. v. Avia Group Int’l*, 222 F.3d 951, 956, 55 USPQ2d 1487, 1491 (Fed. Cir. 2000))).

Petitioner’s challenge based on Lee Figure 3 (and the other disclosures addressed below) amounts to an assertion that it is enough to simply show that “a transport block can be segmented into code blocks with different sizes.” Pet. at 24. That is not the case, at least because the claims further require allocation of the larger or smaller CBs into specific CBGs (*e.g.*, limitations 4i, 5i, 10i, and 11i)—requirements that are not taught in the prior art. Thus, the grounds based on Lee

Figure 3 do not present a reasonable likelihood of invalidating any Challenged Claim.

2. Lee Figure 4

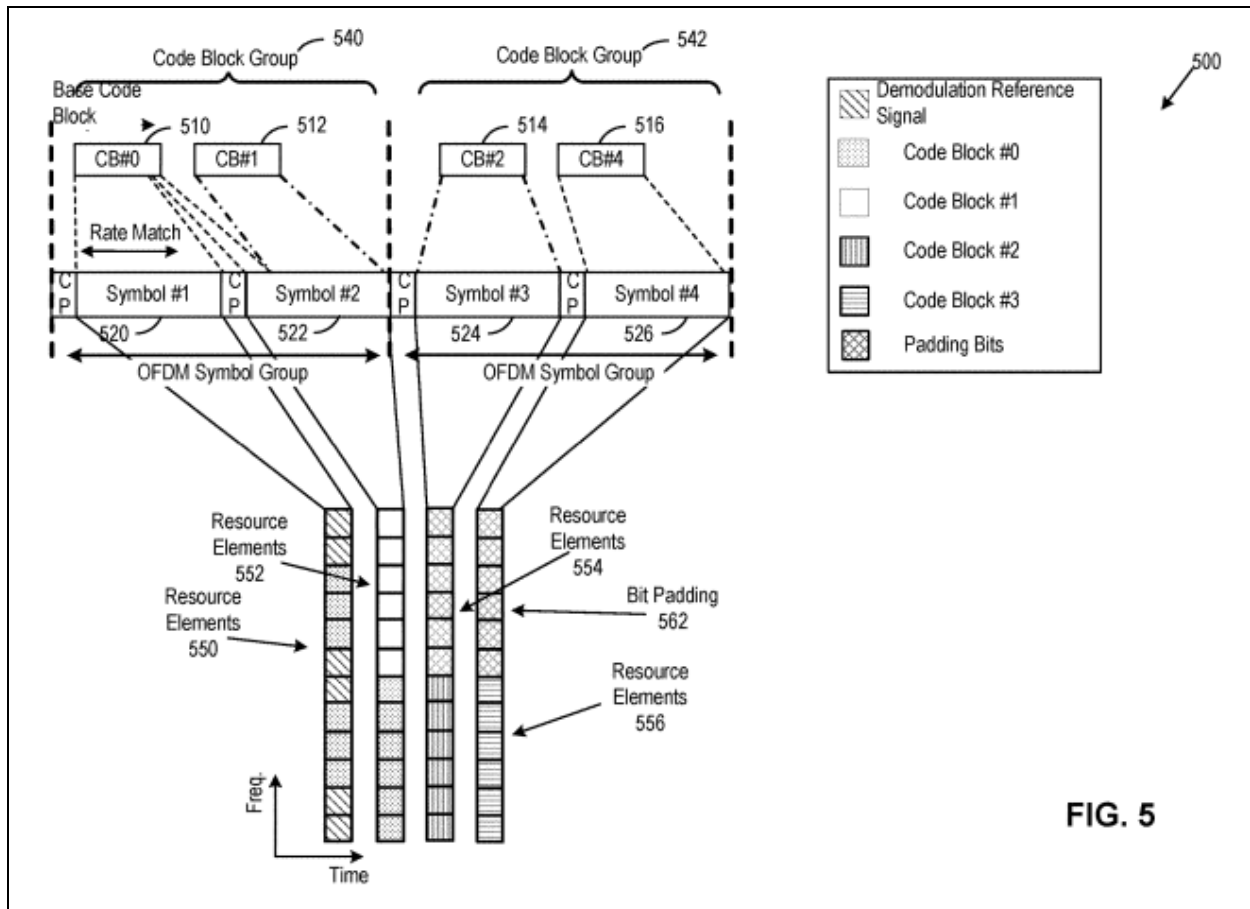


EX1005 Fig. 4.

Much like Lee Figure 3, Lee Figure 4 shows the same number of CBs in each CBG; CBG 440 has two CBs (410 and 412), and CBG 442 also has two CBs (414 and 416). Therefore, Lee Figure 4 fails to teach or render obvious at least limitations 4h/5h/10h/11h. And much like Petitioners' Figure 3 analysis, Petitioners again did

not even attempt to map Lee Figure 4 onto the claimed first/second CBs. Thus, the grounds based on Lee Figure 4 do not present a reasonable likelihood of prevailing.

3. Lee Figure 5



EX1005 Fig. 5.

Lee Figure 5 suffers from many of the same deficiencies as Lee Figures 3 and 4: Lee Figure 5 shows the same number of CBs in each CBG. CBG 540 has two CBs (510 and 512), and CBG 542 also has two CBs (514 and 516). Consequently, Lee Figure 5 fails to teach or render obvious at least limitations 4h/5h/10h/11h. And much like Petitioners' Figure 3 analysis, Petitioners again did not even attempt to

map Lee Figure 5 onto the claimed first/second CBs. Instead, Petitioners simply conclude that it was enough to show “segmentation of a transport block into code blocks having two different sizes.” Pet. at 26. Yet as discussed above, that is not the case; Petitioners must map the First/Second CBs and First/Second CBGs in the claimed manner in order to present a reasonable chance of prevailing against the Challenged Claim limitations. Here, Petitioners did not perform that mapping because they could not—Lee Figure 5 does not even have different numbers of CBs per CBG, much less of the required sizes. Thus, the grounds based on Lee Figure 5 do not present a reasonable likelihood of prevailing.

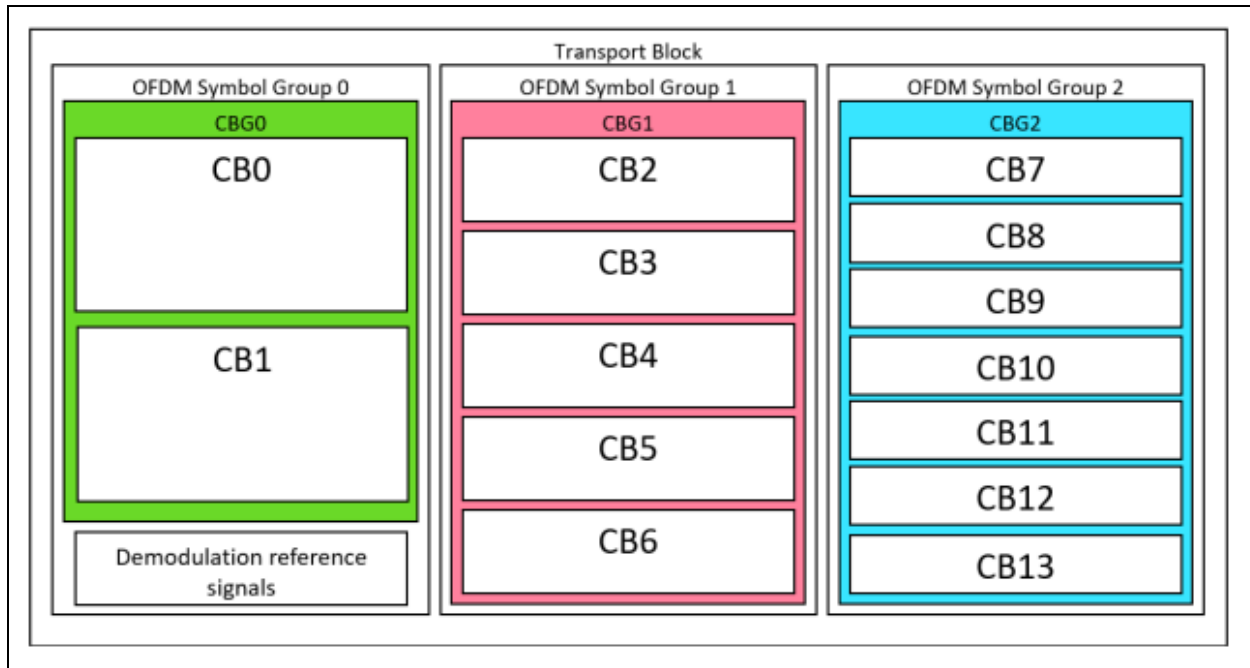
4. Lee Paragraph 39 and Modified Figure 4

Because none of Lee’s embodiments could teach or render obvious the Challenged Claims, Petitioners also assert various theories that they have created by modifying Lee using the teachings of the ’509 Patent as a guide. This is a clear case of impermissible hindsight. *See Ecolochem, Inc. v. S. Cal. Edison Co.*, 227 F.3d 1361, 1371 (Fed. Cir. 2000) (“We cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.” (internal quotes and citations omitted)).

Petitioners improperly justify their modifications based on boilerplate statements from Lee, specifically Lee’s statement that “[i]t may be also possible to have a different number of code blocks (CB) in the code block group (CBG) and/or

different code block sizes per CBG and/or each code block in each CBG may have a distinct size.” EX1005 ¶39 (emphasis added). Notably, Lee never states that it “is possible” to make the specific modifications that Petitioners rely on, or that it would be desirable to make any specific modification. As the Federal Circuit has explained, “boilerplate language” regarding possible “modifications, permutations, additions and sub-combinations” is not sufficient to disclose a permutation that is not actually addressed in the specification. *See D Three Enters., LLC v. SunModo Corp.*, 890 F.3d 1042, 1050-51 (Fed. Cir. 2018). If such a broad statement was sufficient as an invalidity ground, then it would render obvious all possible arrangements of CBs and CBGs, regardless of whether such arrangements were desirable or even technically feasible. An obviousness challenge requires a reason to make a specific proposed modification. While the ’509 Patent identifies such a reason (the fact that a significant difference in the size of two CBGs can have the effect of introducing burst errors), Lee neither recognizes nor proposes solutions to that problem or any other problem that would suggest the claimed arrangement.

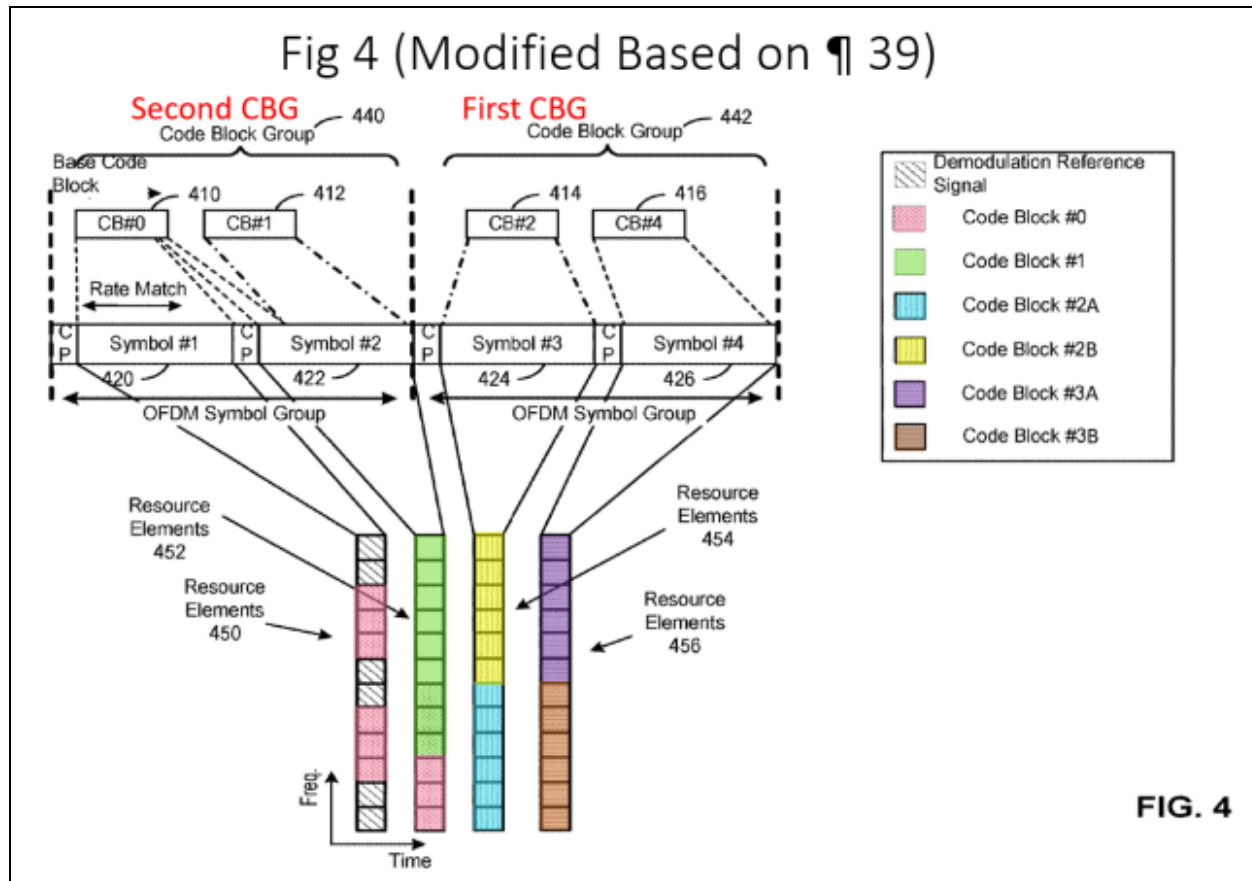
Lee ¶39 discloses an example wherein “a transport block may have three code block groups CBG0, CBG1, CBG2, wherein code blocks CB0, CB1 are in CBG1; CB2-CB6 are in CBG1; and CB7-CB13 are in CBG2.” Petitioners suggest that this teaches the arrangement shown in this figure, which Petitioners created and is not part of Lee:



Pet. at 35.

Note that nearly everything about this figure is arbitrary, and neither Petitioners nor their declarant provide any technical justification for why they chose to allocate the CBs in their figure in the manner shown, as opposed to any other manner. Nor does Lee suggest that the CBs in each CBG could be different sizes, and Petitioners actually concede that “a POSITA would understand Lee paragraph 39 to suggest evenly sized code blocks”—not the differently sized blocked they selected. Pet. at 34. Even if Petitioners’ contradictory positions could be ignored, Petitioners’ hindsight driven figure (above) still fails to satisfy limitations 4f/5f/10f/11f, because it fails to show the capability to include CBs of different sizes in any one of the CBGs.

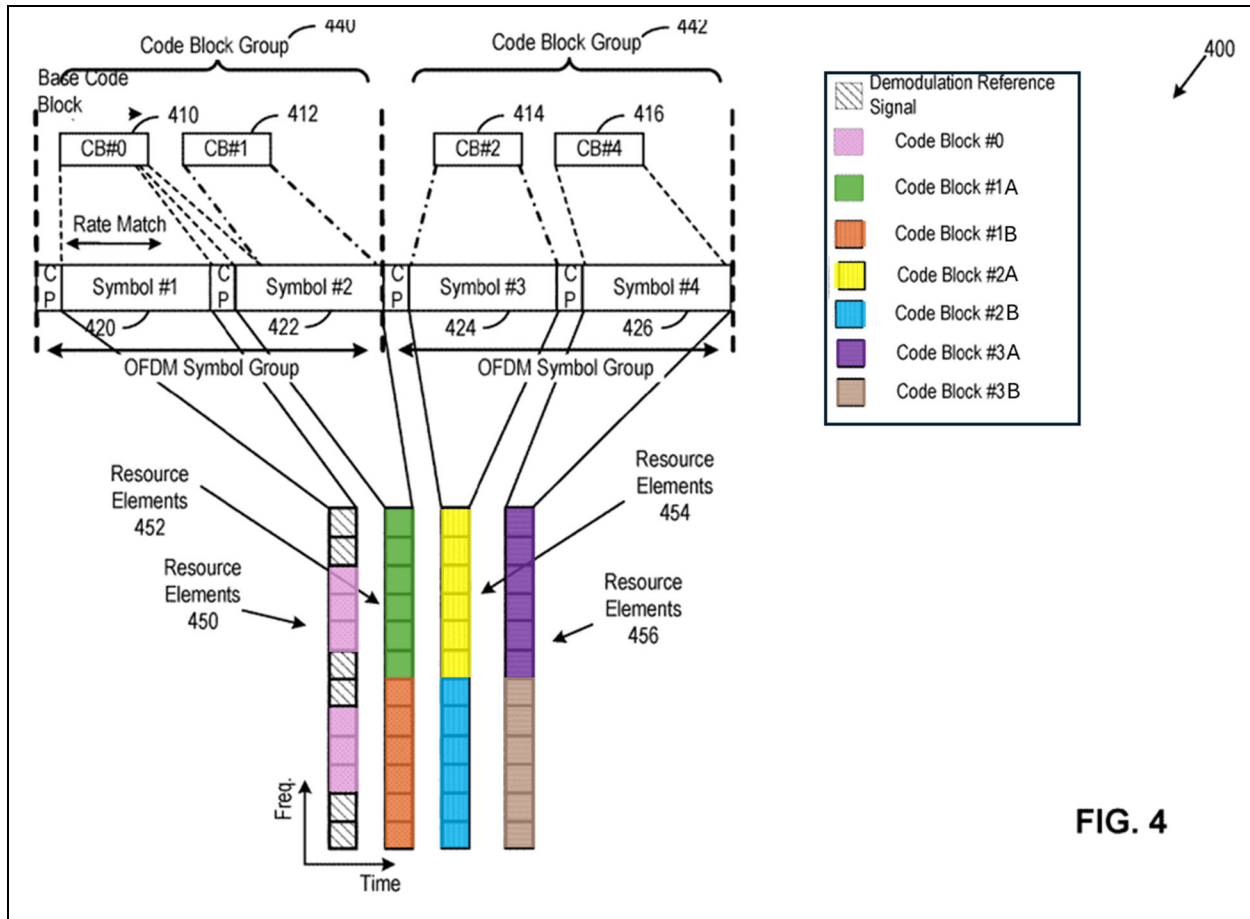
Petitioners then take their flawed assertions further, suggesting that a POSITA would have modified Lee Figure 4 based on Petitioners' admittedly incorrect interpretation of Lee ¶39:



Pet. at 36-37.

But again, Lee never suggests such a segmentation approach. Nonetheless, Petitioners' declarant asserts such a segmentation would have been obvious because it would (1) "evenly allocate the risk of error between code blocks in a code block group, and provide more redundancy for data transmitted further in time from demodulation reference signals," and (2) because it would "keep[] the code block

size / code rate the same within each code block group.” EX1003 ¶87. Yet, the segmentation below would provide the same results (still with a different number of CBs per CBG), and would not read on the Challenged Claims, at least because all CBs are the same size (thus there are no first/second CBs):



EX1005 Fig. 4 (modified based on Petitioners’ declarant’s purported reasons to modify Figure 4).

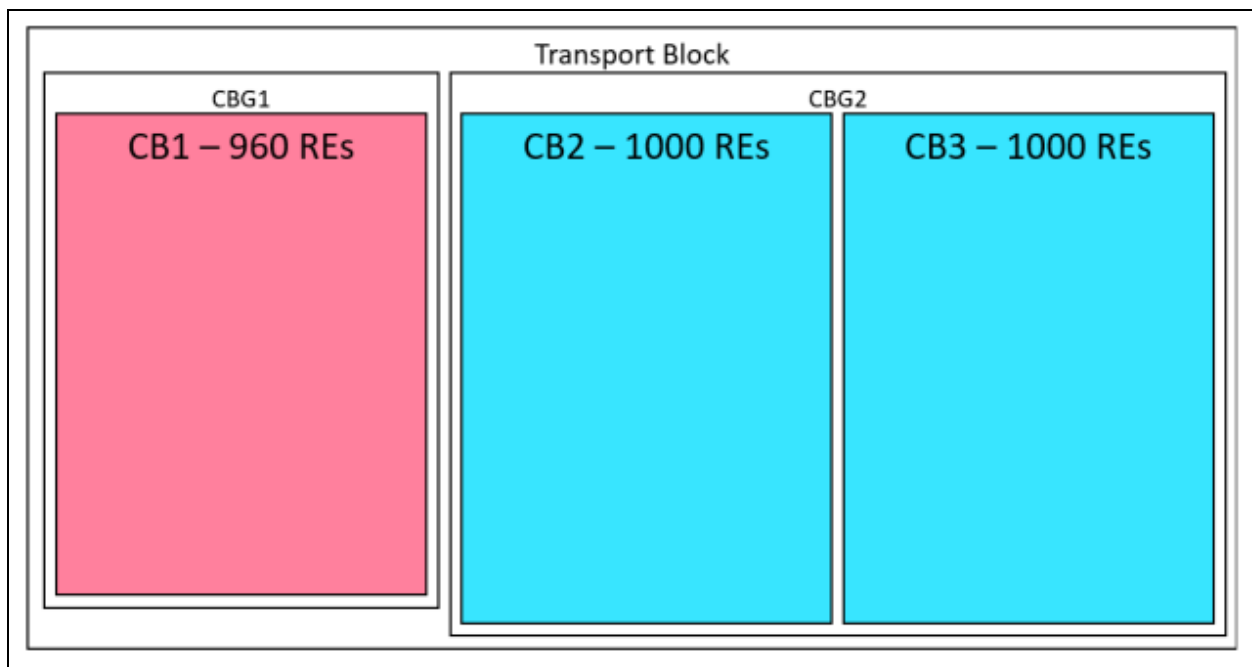
As noted above, Petitioners concede that “a POSITA would understand Lee paragraph 39 to suggest evenly sized code blocks.” Pet. at 34. This concession points a POSITA to the modified Figure 4 above (which has all evenly sized code blocks

across the Board), rather than Petitioners' hindsight based Figure 4 (which uses evenly sized code blocks only where it suits them).⁸ Thus, Petitioners' reasons to modify Lee to read on the Challenged Claims come not from the motivations or references they identified (which point no more to the claimed arrangement than any other possible arrangement), but from a hindsight attempt to reverse engineer the Challenged Claims. Petitioners have provided no reason why a POSITA would have modified the teachings of Lee in the manner relied on in Ground 1 as compared to any other manner, and thus there is no reasonable likelihood of invalidating any Challenged Claims.

⁸ Petitioners suggest that "code block groups with only one size code block can satisfy the claim element" ostensibly based on Patent Owner's previous infringement contentions. Pet. at 34, 41. Petitioners' justification is a citation to Patent Owner's prior infringement contentions out of context. To the extent Petitioners wished to seek something other than the plain meaning of limitations 4e/5e/10e/11e and 4f/5f/10f/11f, they had the burden to propose such a construction. *See* 37 C.F.R. § 42.104(b)(3)-(4). They cannot excuse their failure to satisfy those limitations by misrepresenting Patent Owner's district court filings.

5. Lee Paragraph 42

Petitioners also suggest that Lee ¶42 teaches Challenged Claim limitations 5d-5i and 11d-11i. Pet. at 38-44, 48. Specifically, Petitioners point to the Lee disclosure that “code block segmentation of the transport block can be 960 for the first CB1, 1000 for CB2 and CB3” and “CBG1 has 1 CB and 960 REs [resource elements], and CBG2 has 2 CBs and 1000 REs elements/bits/CB.” Pet. at 39 (citing EX1005 ¶42). Petitioners suggest that the following is an illustrated example of that disclosure:



Pet. at 39 (citing EX1003 ¶106).

Yet, even under Petitioners’ interpretation, this would still fail to render obvious at least limitations 5f and 11f,⁹ because it is limited to a single CB size in

⁹ “each of the multiple CBs is included in any one of the multiple CBGs”

each of the identified CBGs, and thus fails to demonstrate that each of the multiple CBs can be included in any one of the multiple CBGs. Thus, all of Ground 1 fails to present a reasonable likelihood of anticipating or rendering obvious any Challenged Claim.

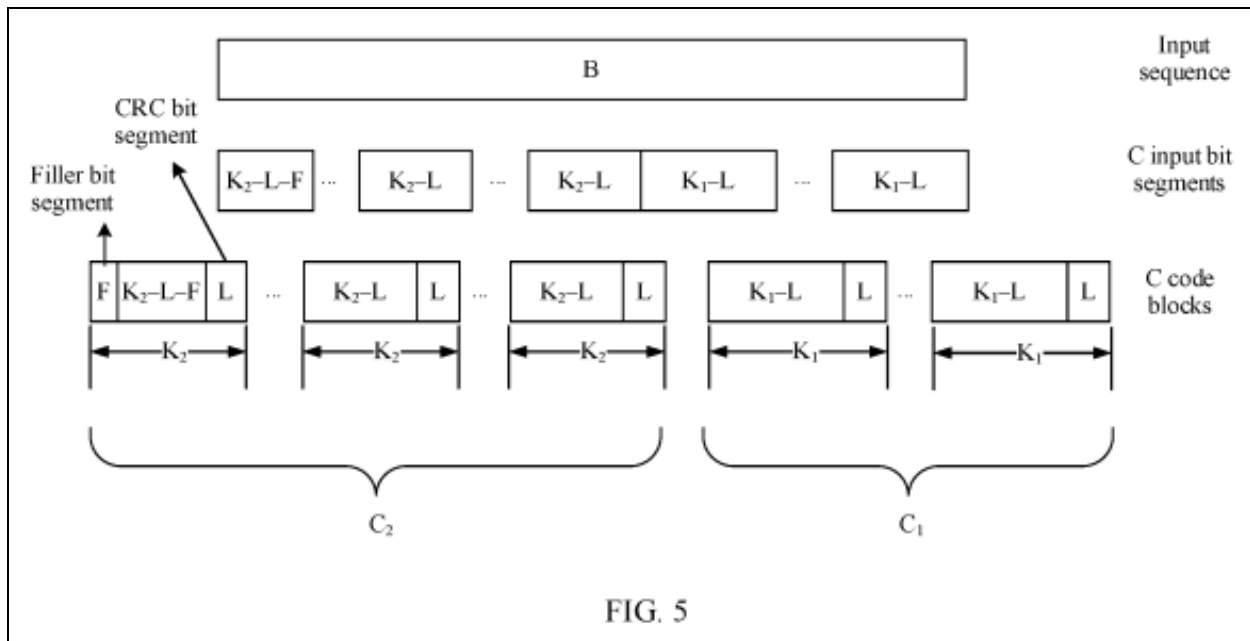
B. Ground 2: Zheng

Much like Lee, Zheng fails to teach or render obvious the Challenged Claims. This is not surprising, given that Zheng does not recognize the reasons for the specific segmentation techniques claimed in the '509 Patent. In fact, Zheng is so unconcerned with such details that many of the Zheng embodiments identify neither the size of the CBs, nor even how many CBs are in any particular CBG. Petitioners are intentionally vague when discussing these examples, failing to even map the Challenged Claim language onto the proposed embodiments. For example, Petitioners never bother to identify which were the purported first CBs and second CBs in Zheng Figures 5-8 that they rely so heavily on, despite the Challenged Claims reciting segmentation specific to the size of the CBs. As further explained below, Petitioners' Zheng ground fails to present a reasonable likelihood of prevailing in anticipating or rendering obvious any Challenged Claim.

In particular, Zheng fails to teach or suggest at least the following claim requirements: (1) a first size of a first CB is greater than a second size of a second CB, (2) a first total number of the one or more first CBs and the one or more second

CBs included in each of the one or more first CBGs is greater than a second total number of the one or more first CBs and the one or more second CBs included in each of the one or more second CBGs, (3) the capability to include one or both first CBs and second CBs within any one of the CBGs, (4) a first CBG includes the greatest number of the smaller second CBs (Claims 4 and 10), and (5) an average value of the numbers of the second CBs included in the second CBGs is greater than an average value of numbers of the second CBs included in the first CBGs (Claims 5 and 11). Petitioners attempted to address these requirements in relation to limitations [4d]-[4i] and [5d-5i], Pet. at 56-72, relying on Zheng Figures 5-8, Table 1, and paragraphs 74 and 127-137. *See also* Pet. at 76, 78 (citing the same for limitations [10d]-[10i] and [11d]-[11i]). Yet, the cited portions of Zheng fail to present a reasonable likelihood of teaching or rendering obvious the Challenged Claims.

1. Zheng Figure 5



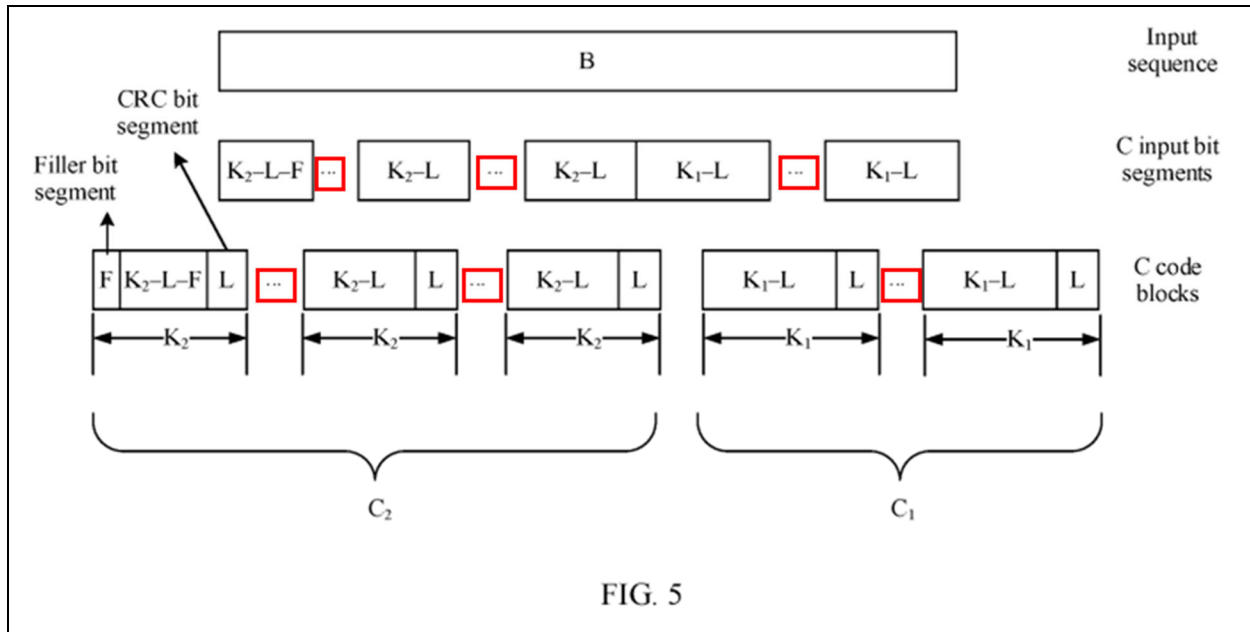
EX1007 Fig. 5

Zheng Figure 5 (shown above), includes “C code blocks.” EX1007 ¶84. According to Zheng, “[i]n the C code blocks, there are C_1 code blocks whose code block lengths are K_1 and C_2 code blocks whose code block lengths are K_2 .” *Id.* Petitioners never actually attempt to map this Figure 5 onto the Challenged Claim language, but instead imply that the limitations must somehow be met because “there are two code block sizes.” *See, e.g.,* Pet. at 57. However, without mapping which is the larger/smaller CB and what are the purported first/second CBGs, it is impossible for Zheng Figure 5 to present a reasonable likelihood of teaching or rendering obvious at least limitations 4i/5i/10i/11i (requiring specific sizes of CBs in specific CBGs), as well as 4f/5f/10f/11f (requiring the capability to each of the multiple CBs

in any one of the multiple CBGs). Even assuming *arguendo* that the first and second CBGs were intended to be C_1 and C_2 (or vice versa), Zheng Figure 5 shows that every CB within the respective “CBGs” have identical sizes— K_2 for C_2 and K_1 for C_1 . Thus, it cannot satisfy limitations 4f/5f/10f/11f.¹⁰

Furthermore, Petitioners also ignore the fact that Zheng does not suggest a specific number of CBs for C_1 or C_2 in relation to Figure 5, and therefore it cannot teach or render obvious limitations 4h/5h/10h/11h. Zheng utilizes ellipses between the various input bit segments and code blocks, which indicates that it does not teach or render obvious *any* particular number of CBs or CBs per CBG, or even which CBG has the most CBs:

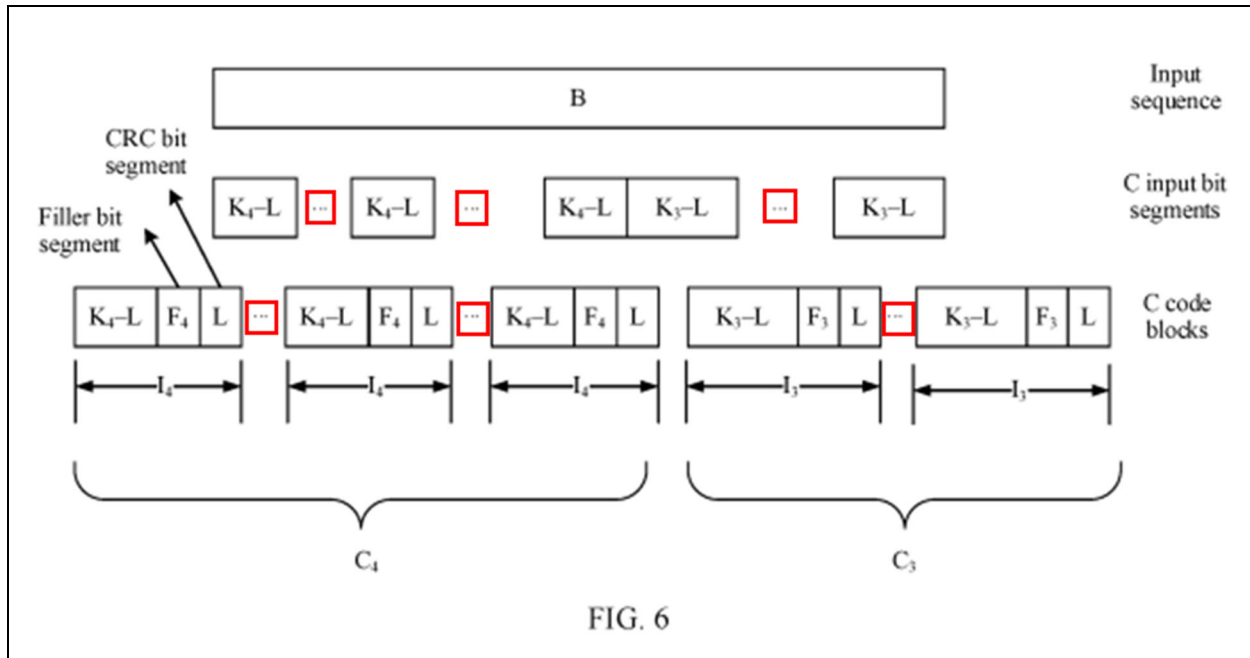
¹⁰ Petitioners suggest that the “input bit segment” of the left most code block might be a separate code block size. Pet. at 57. Petitioners identify no reason to depart from the plain language of Zheng, which states that the code block lengths are K_1 and K_2 . EX1007 ¶84. Nor do Petitioners identify any way their analysis substantively changes if the language of Zheng is ignored.



EX1007 Fig. 5 (annotated to highlight ellipses). This does nothing to teach or render obvious the Challenged Claims, which require each of the first CBGs to include more CBs than each of the second CBGs, as well as specific requirements as to how many first/second CBs of given sizes are in each CBG. For all of these reasons, the grounds based on Zheng Figure 5 cannot present a reasonable likelihood of success.

2. Zheng Figure 6

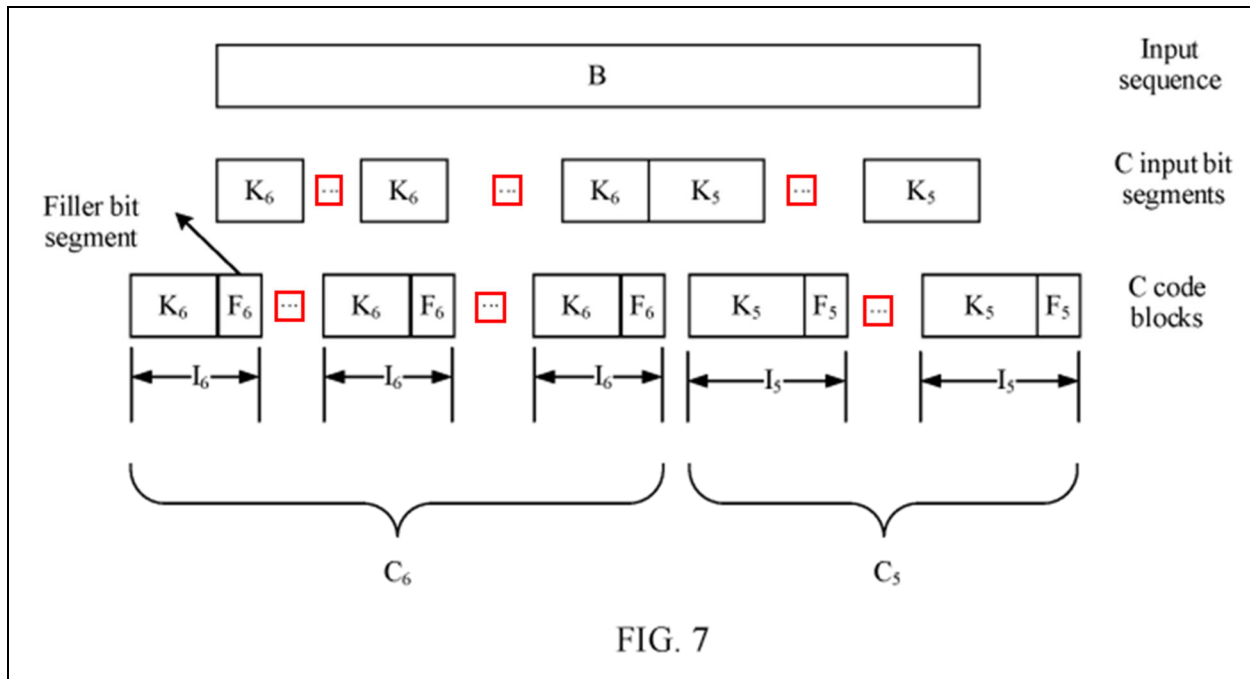
The grounds based on Zheng Figure 6 fail to present a reasonable likelihood of success for many of the same reasons as Zheng Figure 5:



EX1007 Figure 6 (annotated to highlight ellipses). Similar to their grounds for Figure 5, Petitioners made no effort to map the first/second CBs or first/second CBGs to Figure 6. *See* Pet. at 57-58. This failure alone is enough to demonstrate that the grounds based on Figure 6 cannot present a reasonable likelihood of success of teaching or rendering obvious at least limitations 4i/5i/10i/11i, as well as 4f/5f/10f/11f. Further, Zheng Figure 6 again utilizes ellipses between the various input bit segments and code blocks, which indicates that it does not teach or render obvious *any* particular number of CBs or CBs per CBG, or even which CBG necessarily has more CBs. Therefore, Petitioners' grounds based on Zheng Figure 6 cannot teach or render obvious limitations 4h/5h/10h/11h.

3. Zheng Figure 7

The grounds based on Zheng Figure 7 fail to present a reasonable likelihood of success for many of the same reasons as Zheng Figures 5-6:

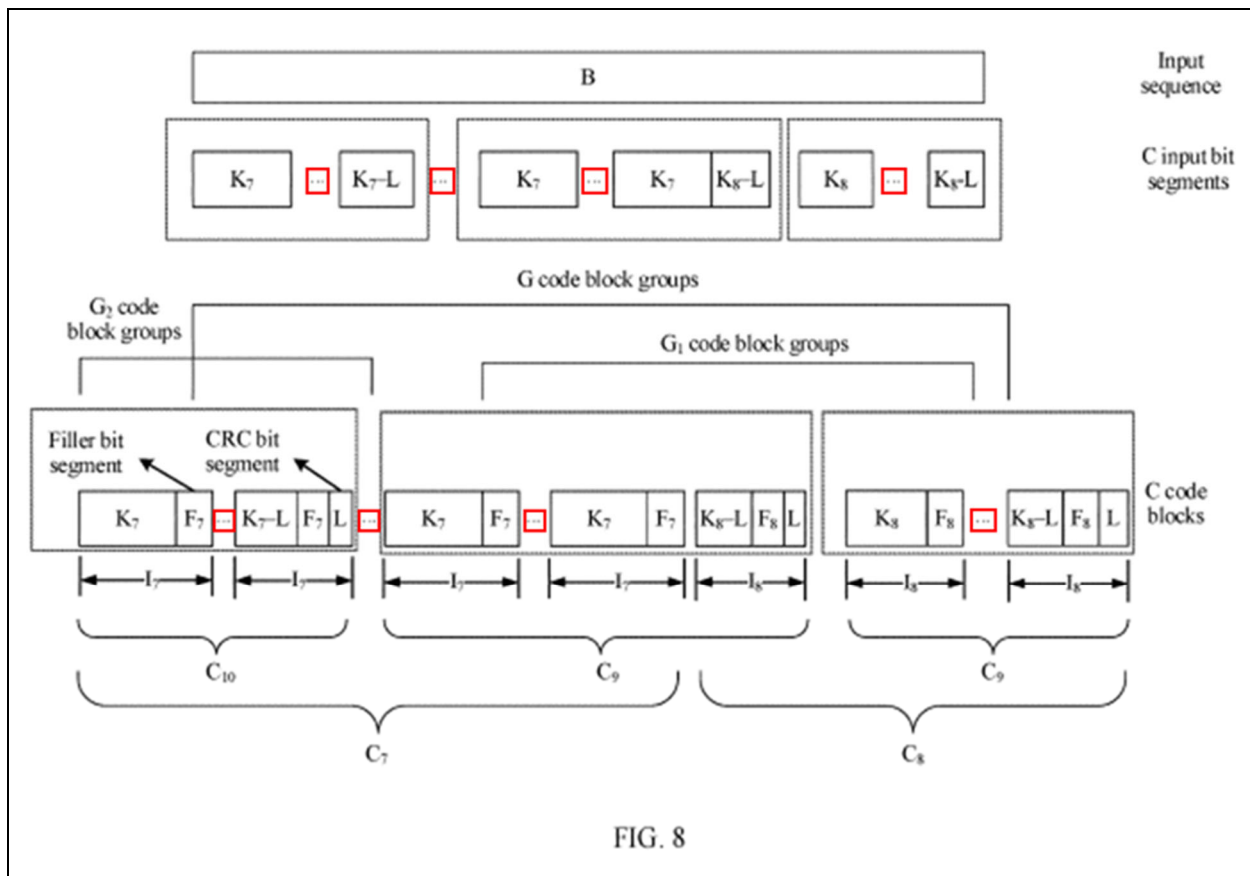


EX1007 Figure 7 (annotated to highlight ellipses). Similar to their grounds for Figures 5-6, Petitioners made no effort to map the first/second CBs or first/second CBGs to Figure 7. *See* Pet. at 58-59. This failure alone is enough to demonstrate that the grounds based on Figure 7 cannot present a reasonable likelihood of success of teaching or rendering obvious at least limitations 4i/5i/10i/11i, as well as 4f/5f/10f/11f. Zheng Figure 7 again utilizes ellipses between the various input bit segments and code blocks, which indicates that it does not teach or render obvious *any* particular number of CBs or CBs per CBG, or even which CBG necessarily has

more CBs. Therefore, Petitioners' grounds based on Zheng Figure 7 cannot teach or render obvious limitations 4h/5h/10h/11h.

4. Zheng Figure 8

Petitioners' grounds based on Zheng Figure 8 similarly fail to present a reasonable likelihood of success:



EX1007 Figure 8 (annotated to highlight ellipses). Similar to their grounds for Figures 5-7, Petitioners made no effort to map the first/second CBs or first/second CBGs to Figure 8. *See* Pet. at 59-60. As discussed above for Figure 5-7, this failure alone is enough to demonstrate that the grounds based on Figure 8 cannot present a reasonable likelihood of success of teaching or rendering obvious at least limitations

4i/5i/10i/11i, as well as 4f/5f/10f/11f. Zheng Figure 8 again utilizes ellipses between the various input bit segments and code blocks, which indicates that it does not teach or render obvious *any* particular number of CBs or CBs per CBG, or even which CBG necessarily has more CBs. Therefore, Petitioners' grounds based on Zheng Figure 8 cannot teach or render obvious limitations 4h/5h/10h/11h.

5. Zheng Table 1

After making no attempt to map Figures 5-8 to the Challenged Claim limitations, Petitioners then cite Zheng Table 1 as purportedly teaching or rendering obvious the Challenged Claims and make their first attempt at mapping the teachings of Zheng to the Challenged Claims. *See* Pet. at 60-61. For Claims 4 and 10, Petitioners first suggest that the “Length (bits) of an input bit segment” field is the CB size,¹¹ and that the first CBs are those highlighted in pink below and the second CBs are those highlighted in blue:

¹¹ Petitioners suggest this interpretation is “consistent with Patent Owner’s reading of the claim.” Pet. at 60 (citing EX1010 at 21). And again, Petitioners’ justification is a citation to Patent Owner’s prior infringement contentions out of context. To the extent Petitioners wished to seek a construction for CB size as limited to input bit length, they had the burden to propose such a construction. *See* 37 CFR

TABLE 1

An Example of Code Block Segmentation				
Group number	Code block number	Length (bits) of an input bit segment	Length (bits) of a CRC bit segment	Length (bits) of a filler bit segment
0	0	6140	0	4
	1	6140	0	4
	2	6116	24	4
1	3	6140	0	4
	4	6140	0	4
	5	6140	0	4
	6	6116	24	4

TABLE 1-continued

An Example of Code Block Segmentation				
Group number	Code block number	Length (bits) of an input bit segment	Length (bits) of a CRC bit segment	Length (bits) of a filler bit segment
2	7	6140	0	4
	8	6140	0	4
	9	6140	0	4
	10	6116	24	4
3	11	6139	0	5
	12	6139	0	5
	13	6139	0	5
	14	6115	24	5

Pet. at 61. Petitioners further assert that CBGs 1, 2, and 3 are the first CBGs, and CBG0 is the second CBG. Pet. at 62-64.

§ 42.104(b)(3)-(4). They cannot excuse their failure to satisfy those limitations by misrepresenting Patent Owner's district court filings.

For Claims 5 and 11, Petitioners then reverse themselves, asserting that “Table 1 provides multiple different sizes” and “Length (bits) of an input bit segment,” is not actually the CB size, but rather “length (bits) of a filler bit segment.”¹² Pet. at 68-70. Notably, neither Petitioners nor their declarant ever provide any technical explanation as to why any of these various fields (that are not the actual CB size identified by Zheng) should be used as the CB size. Petitioners’ declarant takes no position on the correct interpretation of Zheng, and instead simply parrots Petitioners’ theories while providing zero technical analysis. *See, e.g.*, EX1003 ¶163 (“For claim 4, Petitioners pointed to the quantity ‘Length (bits) of an input bit segment’ as the ‘a size’ used in the claim to distinguish between code blocks. For Claim 5, Petitioners point to one of the other sizes of the code block: the ‘length (bits) of a filler bit segment’ as the code block size, which is also a size of the code

¹² Petitioners suggest this interpretation is “consistent with Patent Owner’s reading of the claim.” Pet. at 69 (citing EX1010 at 21). And again, Petitioners’ justification is a citation to Patent Owner’s prior infringement contentions out of context. To the extent Petitioners wished to seek a construction for CB size as including or excluding filler, they had the burden to propose such a construction. See 37 CFR § 42.104(b)(3)-(4). They cannot excuse their failure to satisfy those limitations by misrepresenting Patent Owner’s district court filings.

blocks.”). Such “testimony” is entitled to little weight. *Xerox Corp. et al. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 15 (granting little weight to an expert declaration which “merely repeats, *verbatim*, the conclusory assertion for which it is offered to support”) (precedential).

Ultimately, Petitioners provide no explanation as to why a POSITA would depart from the CB sizes disclosed by Zheng. Zheng includes the input bit length, CRC length, and filler length as part of the CB size:

[E]ach of the code blocks includes an input bit segment in the input sequence, at least one of the code blocks includes a cyclic redundancy check (CRC) bit segment whose length is L, or includes a filler bit segment, B, Z, and C are integers greater than 0, and L is an integer greater than or equal to 0 and less than [maximum code block length] Z.

EX1007 ¶7; *see also id.* ¶¶4 (distinguishing “code block size” from “information data size”), 60 (“[F]iller bits may be inserted to some or all code blocks so that a block length of each code block **equals an allowable code block length**.” (emphasis added)). This is shown in Zheng’s Figures as well, such as Figure 6 which includes the Filler bit segments F₃ and F₄ and CRC bit segment L in the CB size I₃ and I₄:

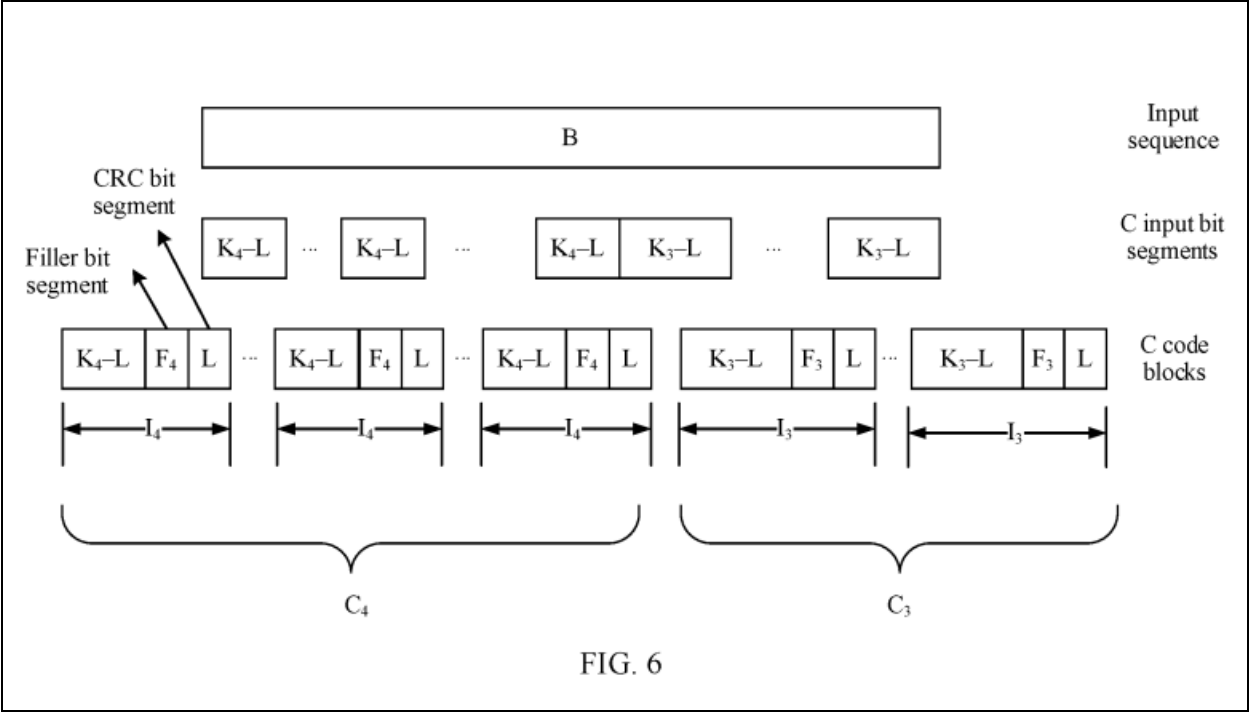


FIG. 6

EX1007 Figure 6.

Applying the same rationale used throughout Zheng to Table 1, all CBs have the same size of 6144 bits:

TABLE 1						
An Example of Code Block Segmentation						
Group number	Code block number	Length (bits) of an input bit segment	Length (bits) of a CRC bit segment	Length (bits) of a filler bit segment		
0	0	6140	+	0	+	4 =6144
	1	6140	+	0	+	4 =6144
	2	6116	+	24	+	4 =6144
1	3	6140	+	0	+	4 =6144
	4	6140	+	0	+	4 =6144
	5	6140	+	0	+	4 =6144
2	6	6116	+	24	+	4 =6144
	7	6140	+	0	+	4 =6144
	8	6140	+	0	+	4 =6144
3	9	6140	+	0	+	4 =6144
	10	6116	+	24	+	4 =6144
	11	6139	+	0	+	5 =6144
3	12	6139	+	0	+	5 =6144
	13	6139	+	0	+	5 =6144
	14	6115	+	24	+	5 =6144

EX1007 Table 1 (Cropped and annotated with CB size as taught by Zheng). This fails to teach or render obvious at least limitations 4e/5e/10e/11e, 4f/5f/10f/11f, and 4i/5i/10i/11i.

6. Zheng Paragraphs 74, 127-137

For limitations 4i and 10i, Petitioners' grounds also rely on their declarant's interpretation of Zheng paragraphs 74 and 127-137:

Code Group Number	Code block Number	Length (bits) of an input bit segment	Length (bits) of a CRC bit segment	Length of filler bit segment	Total length of encoder input
0	0	513	0	127	640
	1	489	24	103	640
1	2	512	0	0	512
	3	512	0	0	512
	4	488	24	0	512

Pet. at 65-67, 76 (citing EX1003 ¶153). Notably, for this example Petitioners have now abandoned their previous interpretations of Zheng in which the “Length (bits) of an input bit segment” and “Length of filler bit segment” were the CB size, and have instead reverted to an interpretation where the “Total length” is the CB size. Pet. at 66-67. Furthermore, Petitioners never explain how they selected most of the values for their calculations (and all their declarant does is parrot back the same conclusions found in the Petition).

Petitioners start with the assertion “that there may be $L=24$ CRC bits associated with each CBG.” They then extrapolate this to mean that $K_7 = \lfloor (B + G \cdot$

$L)/C]^{13} = 513$ according to the Petition, but never expressly identify what values they are using for B, G, or C in that equation.¹⁴ Pet. at 65-66. Utilizing the values for B, G, and C that Petitioners used in some of their other calculations results in $K_7 = \lfloor (B + G \cdot L)/C \rfloor = \lfloor (2514 + 2 \cdot 24)/5 \rfloor = \lfloor 512.4 \rfloor = 512$, **not 513**.

Petitioners never explained where their chosen values for B, G, and C came from. Neither Zheng ¶74 nor Zheng ¶¶127-37 that Petitioners cite suggest the use of such values, and Petitioners' declarant once again provided zero technical analysis justifying selection of those values (assuming those are even the values they used for each equation). Even setting that aside, using the code block size for K_7 received from the equation that Petitioners claim to have applied means that, under their interpretation, the size lines up with an acceptable codeword size (512 bits), no fill or padding is needed, and all code blocks have the same size of 512 bits (given they arrived at the same 512 number for K_8). See Pet. at 65-66. If all code blocks have the

¹³ Zheng uses $\lceil * \rceil$ notation to mean round up and $\lfloor * \rfloor$ to mean round down. EX1007 ¶84.

¹⁴ Neither the Board nor the Patent Owner should be forced to guess at what values Petitioners supposedly used to arrive at 513. The Petition grounds lack sufficient particularity to put Patent Owner on notice of Petitioners' theory. See 35 U.S.C. § 312(a)(3).

same size, then even Petitioners arbitrary theory fails to teach or render obvious limitations 4e/5e/10e/11e,¹⁵ 4f/5f/10f/11f,¹⁶ and 4i/5i/10i/11i.¹⁷

Even if Petitioners’ highly problematic conclusions are taken at face value, they still fail to teach or render obvious the Challenged Claims:

Code Group Number	Code block Number	Length (bits) of an input bit segment	Length (bits) of a CRC bit segment	Length of filler bit segment	Total length of encoder input
0	0	513	0	127	640
	1	489	24	103	640
1	2	512	0	0	512
	3	512	0	0	512
	4	488	24	0	512

Pet. at 66. As shown in Petitioners’ own table, all code blocks within CBG 0 have the same length (640), and all code blocks within CBG 1 have the same length (512).

¹⁵ “a first size of a first CB of the one or more first CBs is greater than a second size of a second CB of the one or more second CBs”

¹⁶ “each of the multiple CBs is included in any one of the multiple CBGs”

¹⁷ “a first CBG of the one or more first CBGs includes a greatest number of the one or more second CBs” (Claims 4 and 10) / “an average value of numbers of the one or more second CBs included in the one or more second CBGs is greater than an average value of numbers of the one or more second CBs included in the one or more first CBGs” (Claims 5 and 11)

Thus, even this ground based on arbitrary values and questionable methodology still fails to teach or render obvious at least limitations 4f/5f/10f/11f because it fails to show that each of the multiple CBs can be included in any one of the multiple CBGs.

VII. Conclusion

Patent Owner respectfully requests that the Board refuse to institute *inter partes* review for the reasons stated herein.

Dated: July 15, 2024

Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned certifies that pursuant to 37 C.F.R. § 42.6(e), a copy of the foregoing was served via email to lead and backup counsel of record for Petitioners as follows:

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CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), the undersigned hereby certifies that this brief complies with the type-volume limitation of 37 C.F.R. § 42.24 because this brief contains 6,747 words.

Dated: July 15, 2024

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