

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.,
Petitioner,

v.

DAINGEAN TECHNOLOGIES LTD.,
Patent Owner.

IPR2024-00730
Patent 11,196,509 B2

Before CHRISTOPHER L. OGDEN, JOHN R. KENNY, and
MARY C. HOFFMAN, *Administrative Patent Judges*.

KENNY, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

AT&T Mobility LLC, AT&T Services Inc., Ericsson Inc., Nokia of America Corporation, and T-Mobile USA, Inc. (collectively, “Petitioner”) filed a Petition to institute an *inter partes* review of claims 4, 5, 10, and 11 (the “challenged claims”) of U.S. Patent No. 11,196,509 B2 (Ex. 1001, the “’509 patent,” “challenged patent”) pursuant to 35 U.S.C. § 311 *et seq.* Paper 2 (“Pet.”). Daingean Technologies Ltd. (“Patent Owner”) filed a Preliminary Response. Paper 8 (“Prelim. Resp.”).

The Petition, to justify institution of review, must demonstrate a reasonable likelihood that Petitioner would prevail with respect to at least one challenged claim. *See* 35 U.S.C. § 314(a) (2018). After considering the Petition, the Preliminary Response, and the evidence of record, we determine that the Petition has not met this standard. Therefore, we decline to institute an *inter partes* review.

A. Related Matters

The parties identify the following related district court litigations:

Daingean Tech. Ltd. v. AT&T Corp. et al., 2:23-cv-00123-JRG (E.D. Tex. Mar. 24, 2023)¹;

Daingean Tech. Ltd. v. T-Mobile USA, Inc., 2:23-cv-00347-JRG (E.D. Tex. July 24, 2023)²; and

Daingean Technologies Ltd. v. Apple Inc., No. 3:23-cv-01560 (S.D. Cal. filed Aug. 24, 2023)³.

Pet. 1; Paper 3.

¹ Petitioner indicates that this case was dismissed without prejudice. Pet. 1.

² Petitioner indicates that this case was dismissed without prejudice. Pet. 1.

³ Patent Owner indicates that the ’509 patent is no longer being asserted in this case. Paper 3.

B. Challenged Patent

The '509 patent discloses a terminal apparatus for performing uplink and/or downlink communication. Ex. 1001, code (57). “Multiple CBs [code blocks] included in the transport block [are] decoded.” *Id.* “HARQ-ACKs [hybrid automatic repeat request acknowledgements] corresponding to multiple CBG [code block groups] are transmitted.” *Id.* “The multiple CBs include one or more first CBs and one or more second CBs.” *Id.* “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.” *Id.* “Each of the multiple CBs is included in any one of the multiple CBGs.” *Id.* “The multiple CBGs include one or more first CBGs and one or more second CBGs.” *Id.* “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.” *Id.*

C. Challenged Claims

Petitioner challenges claims 4, 5, 10, and 11, all of which are independent. Claim 4 reads:

4. [4pre]⁴ 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

⁴ For ease of reference, we include the Petition’s bracketed designations provided for the preamble recitations and limitations of claim 4. Pet. iv–v.

[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,

[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.

Ex. 1001, 48:6–31; *see also* Pet. vi–viii.

D. Asserted Challenges to Patentability and Prior Art

Petitioner challenges claims 4, 5, 10, and 11 based on the grounds in the table below:

Ground	Claims Challenged	35 U.S.C. § ⁵	References
1	4, 5, 10, 11	102, 103	Lee ⁶
2	4, 5, 10, 11	103, 103	Zheng ⁷

Pet. 5.

⁵ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. §§ 102 and 103, effective March 16, 2013. Because the applications to which the ’509 patent makes claims of priority were filed after that date, we refer to the AIA version of § 103. Ex. 1001, codes (22) and (30).

⁶ U.S. Patent Application Publication No. 2019/0327024 (Ex. 1005).

⁷ U.S. Patent Application Publication No. 2019/0173499 (Ex. 1007).

Petitioner submits a declaration with proffered expert testimony from Dr. Wayne Stark (Ex. 1003). Patent Owner has not submitted a declaration with proffered expert testimony.

II. LEVEL OF SKILL AND CLAIM CONSTRUCTION

A. Level of Skill in the Art

Petitioner argues that an ordinarily skilled artisan would have had a B.S. in Electrical Engineering or a related field with at least three years of experience designing, developing, and/or testing telecommunication systems. Pet. 5 (citing Ex. 1003 ¶¶ 31–32). Petitioner further argues that additional education may supplement practical experience or vice versa. *Id.* Patent Owner does not contest Petitioner’s recitation of the level of ordinary skill in the art. Prelim. Resp. 8. For purposes of this Decision, we accept Petitioner’s definition.

B. Claim Construction

Neither party proposes any claim term for construction. Pet. 4; Prelim. Resp. 8–9. For purposes of this Decision, however, we find it necessary to construe the phrase “each of the multiple CBs is included in any one of the multiple CBGs” (“multiple CB/CBG limitation”), recited in limitations 4f, 5f, 10f, and 11f⁸ of claims 4, 5, 10, and 11, respectively. Ex. 1001, 48:19–20, 48:44–45, 50:44–45; 51:1–2; *see also* Pet. iv–vi.

Both parties implicitly construe the multiple CB/CBG limitation. Petitioner implicitly does so through the testimony of its expert, Dr. Stark, who testifies that the limitation requires that the CBs be in two or more CBGs. Ex. 1003 ¶ 88. Neither Petitioner nor Dr. Stark, however, provides any support for this implicit construction, and we see none. *Id.* The plain

⁸ These limitations are identified on pages iv–vi of the Petition.

language of the multiple CB/CBG limitation does not require the CBs to be in two or more CBGs. Further, we see nothing in the Specification that teaches the multiple CB/CBG limitation has such a requirement.

In addition, the prosecution history of the '509 patent does not support this proposed construction. The prosecution history is not instructive regarding the meaning of the multiple CB/CBG limitation because there were no substantive office actions during the prosecution of the '509 patent, other than the notice of allowability. Ex. 1002, 347. Further, the notice of allowability does not provide any explanation regarding the scope of the multiple CB/CBG limitation. *Id.* at 350–352. Thus, reviewing the current record, we find no support for Petitioner's implicit construction.

Patent Owner argues that the multiple CB/CBG limitation requires the capability to include one or both first CBs and second CBs within any one of the CBGs. Prelim. Resp. 9–10. The plain and ordinary meaning of the CB/CBG limitation, however, does not provide such a requirement. Instead, the plain and ordinary meaning of “each of the multiple CBs is included in any one of the multiple CBGs” simply requires that at least one CBG contain each CB. Although the description in the Specification of the configuration example of Figure 11(c) arguably describes the capacity of a system to include the first and second CBs in any one of CBGs, the Specification's permissive language does not appear in the challenged claims. That description reads:

The second sequence b_k may include at least one or more first code blocks and one or more second code blocks. The code block size of the first code block may be greater than the code block size of the second code block. Each one of the one or more first code blocks and one or more second code blocks *may be included* in any of multiple CBG.

Each of the one or more first code blocks and the one or more second code blocks *may be mapped* to any of multiple CBG.

Ex. 1001, 23:31–39 (emphases added). The reason that the above description arguably describes the capability to include the first and second blocks in each CBG is due to its phrases “may be included” and “may be mapped.” The multiple CB/CBG limitation, however, does not include this permissive language. Thus, we also do not adopt Patent Owner’s implicit construction for the multiple CB/CBG limitation.

Although we do not accept either party’s implicit construction for the multiple CB/CBG limitation, we nevertheless find it necessary to construe the limitation. Upon review of the record, we construe the limitation as requiring that at least one CBG includes each of the multiple CBs. The plain meaning of “each of the multiple CBs is included in any one of the multiple CBGs” is that each CB is included in a CBG, which means that at least one CBG includes each of the multiple CBs. Further, the Specification supports construing the limitation to have this plain meaning. Figure 11 of the ’509 patent, shown below, provides a configuration example of CBGs (Ex. 1001, 23:7–8):

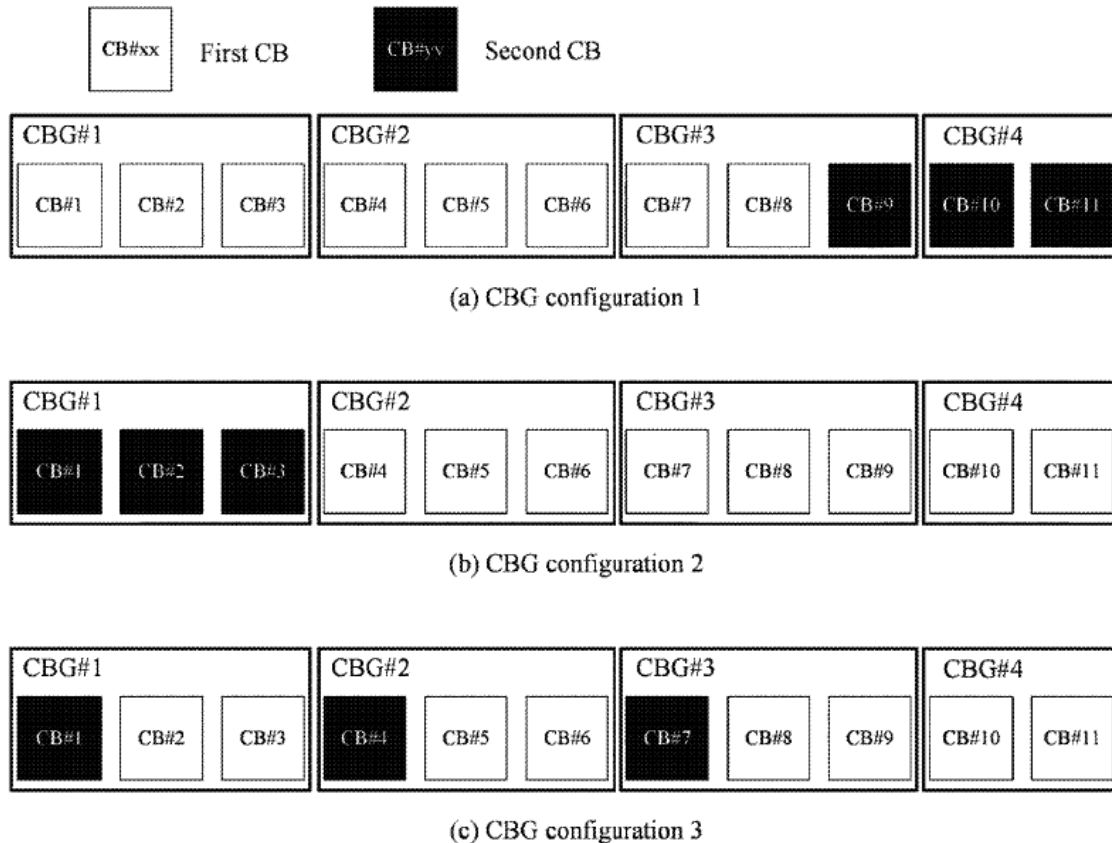


FIG. 11

In Figure 11 above, “blank blocks indicate first code blocks and filled blocks indicate second code blocks.” Ex. 1001, 23:9–10. The Specification describes, that, in CBG configuration 3, shown in section (c) of Figure 11 (“Figure 11(c)”) above, “CBG#1 to CBG#3 include the first code block and the second code blocks, and CBG#4 includes the first code blocks.” *Id.* at 23:26–28. As this description discloses and as shown in Figure 11(c), CBG#1 to CBG#3 each include both first code and second code blocks. Thus, the Specification uses the ordinary meaning of the term “include” to describe these code block groups (i.e., that each of these code block groups has a first and a second code block). Further, The Specification describes that, in configuration 2, shown in Figure 1(b) above, CBG#1 includes only the second

code blocks and CBG#2 to CBG#4 include the first code blocks. *Id.* at 23:22–23. The Specification describes that, in configuration 1, shown in Figure 1(a) above, the first CBG (CBG#1 through CBG#3) includes many first code blocks and the second CBG (CBG#4) includes only the second code blocks. *Id.* at 23:14–17. All of these descriptions use the ordinary meaning of “include,” which supports construing the multiple CB/CBG limitation in accordance with the ordinary meaning of “include” as requiring that at least one CBG includes each of the multiple CBs.

In sum, we construe the multiple CB/CBG limitation as requiring that at least one CBG includes each of the multiple CBs.

III. ANALYSIS OF ASSERTED GROUNDS

A. Asserted Prior Art References

1. Lee (Ex. 1005)

Lee discloses “a receiver that processes a data signal and provides an acknowledgement within a turnaround time through use of code block alignment, reduced complexity or increased processing time.” Ex. 1005, code (57). “In a first embodiment, a radio access network (RAN) node enables encoded information to be segmented into multiple code blocks and maps a group of code blocks to be aligned with orthogonal frequency division multiplexing (OFDM) symbol boundaries.” *Id.* “In a second embodiment, the transmitter can provide more time or reduce the complexity of the packet, such as by repetition of bits of code blocks of the encoded information or by reserving resource elements (REs).” *Id.* As a result, “the receiver has effectively more time (or less complexity) to process the last or last few code blocks of the packet.” *Id.*

Figure 4 of Lee is shown below:

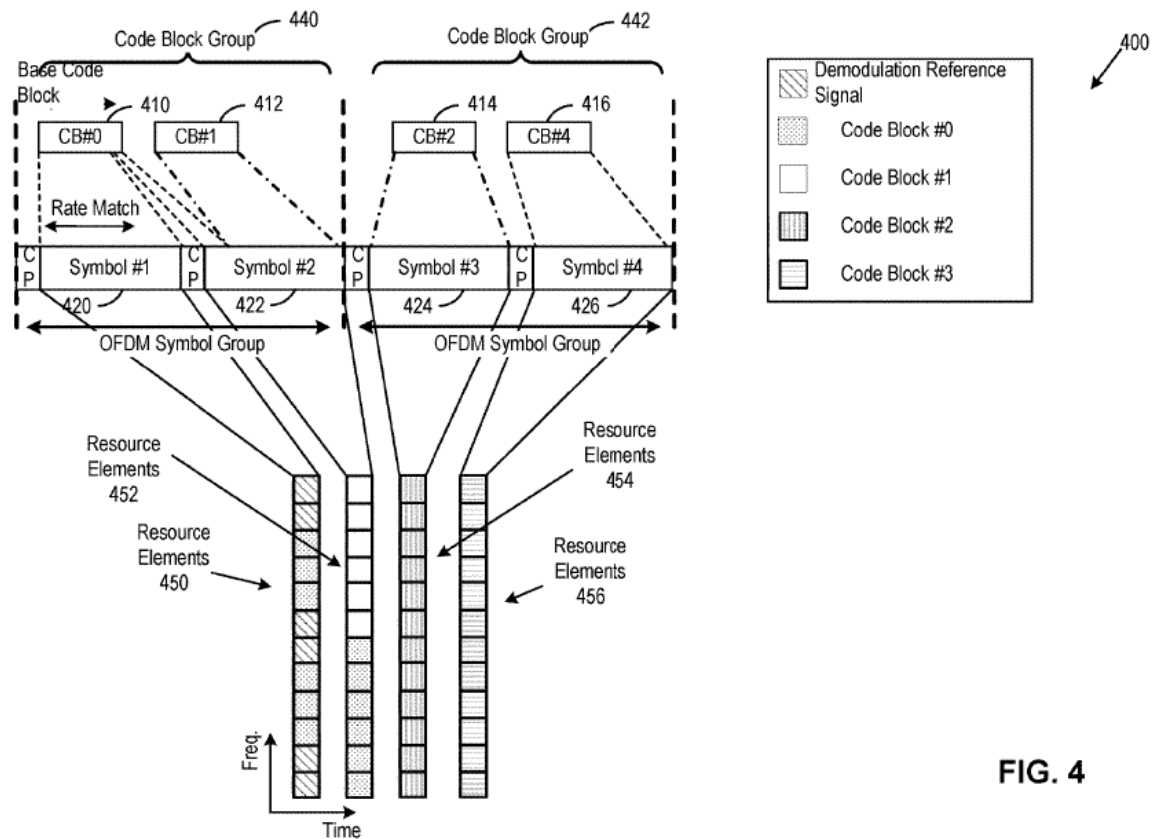


FIG. 4

Figure 4 above “is a diagram 400 illustrating varying available resource elements (REs) 450, 452, 454 and 456 per OFDM symbol 420, 422, 424 and 426.” Ex. 1005 ¶ 40. “Each OFDM symbol 420, 422, 424 and 426 of the allocated data transmission may have a different number of available REs for data transmission.” *Id.* “If a code block group 440 or 442 (comprising base code blocks 410, 412, 414 and 416) is rate matched to always fit into M OFDM symbols 420, 422, 424 and 426, different code block groups 440, 442 can end up with different code rates.” *Id.* “This may result in different link performance.” *Id.* “This example of different OFDM symbols 420, 422, 424 and 426 containing a different number of allocated REs is shown in FIG. 4.” *Id.* “In the example, the second code block group 442 is sent over more REs

compared with the first code block group 440 due to the demodulation reference signal (DRS) utilizing a portion of the REs 450.” *Id.*

2. Zheng (Ex. 1007)

Zheng discloses an information processing method. Ex. 1007, code (57). A communication device obtains an input sequence. *Id.* The input sequence has a quantity B of information bits. *Id.* The communication device transforms the input sequence into one or more code blocks. *Id.* The communication device encodes each of the code blocks individually, to obtain one or more encoded code blocks. *Id.* Each of the code blocks has a code block length less than or equal to a maximum code block length. *Id.* Each of the code blocks includes a segment of the input sequence and may include one or more cyclic redundancy check (CRC) bits corresponding to the segment of the input sequence. *Id.* The encoded code blocks can meet various channel coding requirements. *Id.*

Table 1 of Zheng is provided in two parts in Zheng. Both parts are reproduced below:

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

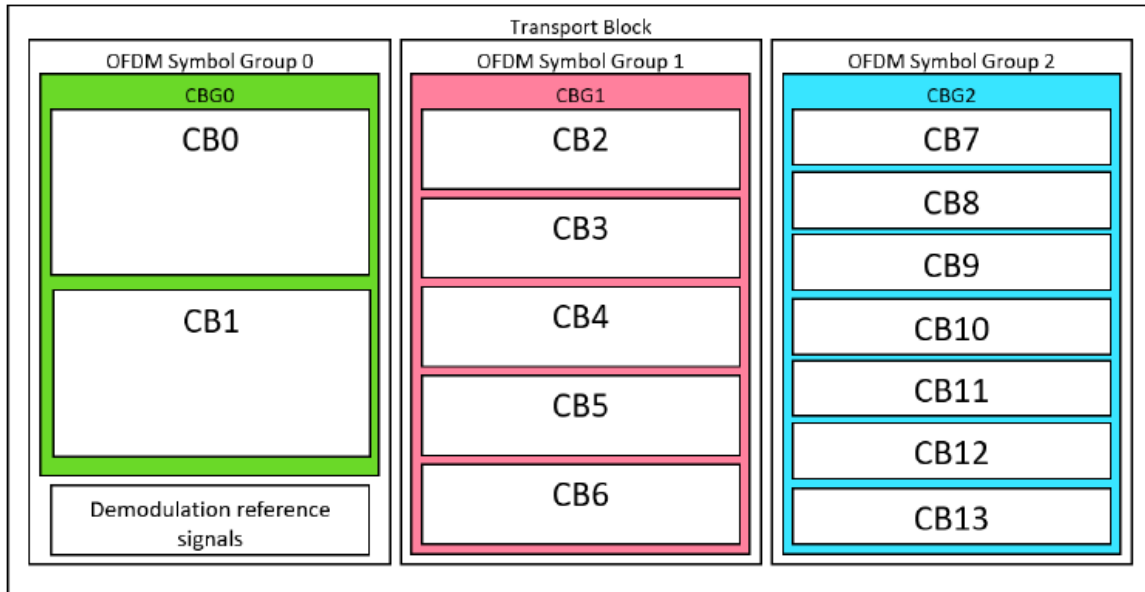
TABLE 1-continued

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

Ex. 1007, Table 1. Table 1 above shows an example of a length of an input bit segment, a length of a CRC bit segment, and a length of a filler bit segment in each code block in a block segmentation manner. *Id.* ¶ 140.

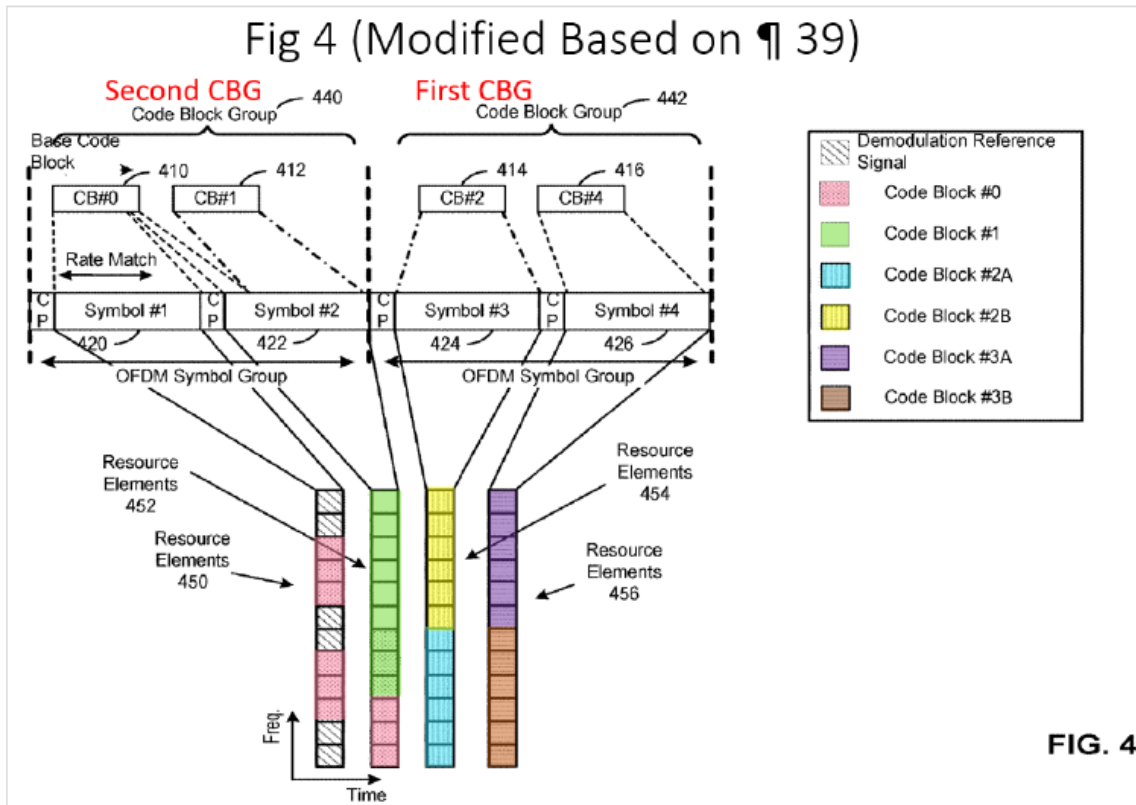
B. Ground 1: Asserted Anticipation by and Obviousness over Lee

Petitioner asserts that claims 4, 5, 10, and 11 are anticipated by and would have been obvious over Lee. Pet. 5. For the multiple CB/CBG limitation, Petitioner argues that paragraph 39 of Lee describes the following arrangement:



Pet. 31–32 (citing Ex. 1003 ¶ 89). The above figure depicts a transport block arrangement with three OFDM symbol groups (code block groups), each containing code blocks. Petitioner asserts that the above arrangement satisfies the multiple CB/CBG limitation. *Id.*; *see also id.* at 40, 44, 46. We determine that Petitioner, however, has not demonstrated a reasonable likelihood of proving that assertion. Petitioner maps the recited first CBs to code blocks CB0 and CB1 and the recited second CBs to code blocks CB2–CB6. *Id.* at 32. That mapping, however, does not satisfy the multiple CB/CBG limitation because no CBG in the above figure contains both a first block and a second block. CBG0 contains only first CBs. CBG1 contains only second CBs, and CBG2 contains neither first nor second CBs. Therefore, no CBG contains each of the multiple CBs.

In the section of the Petition addressing the multiple CB/CBG limitation, Petitioner also addresses limitations 4g and 4h. Pet. 31–34. For limitations 4g and 4h, Petitioner argues that an ordinarily skilled artisan would have been motivated by paragraph 39 of Lee to modify the segmentation shown in Figure 4 of Lee as follows:



Id. at 33. Petitioner, however, does not rely on the above modification for the multiple CB/CBG limitation (limitation 4f). *Id.* at 33–34.

For Ground 1, we determine that Petitioner has not made a sufficient showing for the multiple CB/CBG limitation. Thus, Petitioner has not demonstrated a reasonable likelihood of proving that claims 4, 5, 10, and 11 are anticipated by or would have been obvious over Lee.

C. Ground 2: Asserted Anticipation by and Obviousness over Zheng

Petitioner asserts that claims 4, 5, 10, and 11 are anticipated by and would have been obvious over Zheng. Pet. 5.

Petitioner argues that Table 1 of Zhang teaches the multiple CB/CBG limitation and provides the following annotated copy of that table:

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. 62–63; *see also id.* at 70, 76, 78. Table 1 of Zheng provides an example of code block segments. Ex. 1007, Table 1. Petitioner maps the recited first CBs to code block numbers 0, 1, 3, 4, 5, 7, 8, and 9, which are highlighted in pink. Pet. 63. Petitioner maps the recited second CBs to code block numbers 11–13, which are highlighted in blue. *Id.* Petitioner maps the recited code block groups to group numbers 0–3 in the above table. *Id.* As can be seen from the above table, none of the code block groups 0–3 contain a first and a second code block. Code block groups 0–2 each contain first code blocks,

but no second code blocks. Code block 3 contains second code blocks, but no first code blocks. Therefore, no CBG contains each of the multiple CBs.

For Ground 2, we determine that Petitioner has not made a sufficient showing for the multiple CB/CBG limitation. Thus, Petitioner has not demonstrated a reasonable likelihood of proving that claims 4, 5, 10, and 11 are anticipated by or would have been obvious over Zheng.

IV. CONCLUSION

After considering the Petition, the Preliminary Response, and the evidence of record, and for the reasons discussed above, we determine that Petitioner has not demonstrated a reasonable likelihood that it would prevail in proving the unpatentability of at least one claim challenged in the Petition. Hence, we deny the Petition and do not institute an *inter partes* review.

V. ORDER

It is

ORDERED that the Petition is denied and no trial is instituted.

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