

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner

v.

G+ COMMUNICATIONS, LLC
Patent Owner

IPR2023-00665
Patent No. 9,184,881

PETITIONER'S REQUEST FOR REHEARING

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I. INTRODUCTION

Petitioner respectfully requests rehearing pursuant to 37 C.F.R. § 42.71(d) of the Board's Decision (Paper 10, "Decision" or "Dec.") denying institution of IPR of claims 1-14 of the '881 patent. Respectfully, Petitioner's request should be granted and IPR instituted because the Board misapprehended or overlooked Petitioner's arguments and evidence establishing that Malladi discloses the "fails to detect" limitation,¹ as recited in claims 1 and 9:

- [9.pre-1] "in a situation that a user equipment *fails to detect* a physical downlink control channel corresponding to transmitted data in a sub-frame transmitting data"; and
- [9.c] / [1.e] "when the user equipment *fails to detect* the physical downlink control channel corresponding to the transmitted data in the sub-frame which transmits the data."

Rehearing is appropriate because the Decision misapprehended the meaning of the "fails to detect" limitation, excluding from its scope a scenario where a UE incorrectly decodes a PDCCH and misses the control information, based on a distinction that does not exist in the specification of the '881 patent. Under a proper interpretation, Malladi discloses this limitation, because, as explained in the Petition,

¹ Claim language is underlined throughout.

a UE that incorrectly decodes the PDCCH and misses the control information “fails to detect” the PDCCH.

Malladi also discloses this limitation under the Board’s misapprehended interpretation. Here, the Decision misapprehended Malladi, limiting its broad teachings regarding a UE that misses the PDCCH to a UE that incorrectly decodes the PDCCH and misses the control information, which is only one way a UE may miss the PDCCH.

For these reasons, as discussed in more detail below, Petitioner respectfully requests rehearing and institution of IPR of claims 1-14 of the ’881 patent, so that the proper interpretation of the “fails to detect” limitation and whether it is disclosed by the prior art can be determined on a more complete record developed during IPR.

II. ARGUMENT

The Petition (Paper 1, “Petition” or “Pet.”) explained that Malladi’s broad teaching of a “scenario where control information is missed” discloses the “fails to detect” limitation. (Pet., 16-18; *see also* EX1002, ¶¶60-63.) The Board initially acknowledged this explanation and Malladi’s broad teaching, (Dec., 13), but based on Patent Owner’s (“PO”) misunderstanding of both the ’881 patent and Malladi,²

² PO’s arguments in its Preliminary Response (Paper 6, “Prelim. Resp.”), which the Board adopted, (*see* Dec., 14-15 (citing Prelim. Resp., 25-30)), are also inconsistent

(Paper 6, 14), reached the following conclusions:

(i) The specification of the '881 patent draws a “distinction” between “fails to detect a physical downlink control channel corresponding to transmitted data in the sub-frame transmitting the data” and “fails to receive the data thereof,” but the claims “only recite[] ‘fails to detect,’ thus indicating that fails to receive is not encompassed by the claim,” (Dec., 14-15).

with PO’s arguments in district court. PO argues in its Preliminary Response that a “UE ‘miss[ing]’ the control information” does not disclose a “UE [that] ‘fails to detect’ the PDCCH.” (Prelim. Resp., 25.) Yet, in district court, PO took the opposite position, arguing that a “missed” “downlink assignment”—i.e., control information, as confirmed by Malladi’s description of TDD’s PDCCH, (*see* EX1005, ¶[0026] (“scheduling assignments and other control information”)—discloses the “fails to detect” limitation. (EX1015, 26 (“[T]he Accused Device is configured to generate NACK acknowledgement for all the codewords whose downlink assignment has been missed”), 27 (relying on text in 3GPP standard where there is a “detected PDCCH” but “at least one downlink assignment has been missed,” resulting in a NAK), 72 (same).) PO failed to inform the Board of this inconsistent position, as required. *See* 37 CFR § 42.51(b)(1)(iii).

(ii) “Malladi describe[s] a situation where a PDCCH was detected but incorrectly decoded, leading to a situation where the control information was missed/not received by the UE,” (*id.*, 15-17).

As discussed below, the Board’s conclusions were based on both a misapprehension of the ’881 patent and Malladi.

A. The Decision Misapprehended the “Fails to Detect” Limitation

The Board’s analysis of Malladi is based on a misapprehended interpretation of the “fails to detect” limitation recited in claims 1 and 9, which improperly excludes a UE that incorrectly decodes the PDCCH and misses the control information. The Board’s interpretation followed from its misapprehension that the specification of the ’881 patent creates a “distinction between a situation where the UE ‘fails to detect’ a PDCCH and when it fails to receive the PD[C]CH.”³ (*Id.*, 14-15.) The specification nowhere makes such a distinction.

With respect to the PDCCH, the specification describes a failure to “detect” but not a failure to “receive.” *Every* reference to a failure to “receive” in the

³ The Decision recites “PDDCH,” which does not correspond to any physical channel used in LTE. Based on the context, it appears “PDCCH” was intended. The same typographical error appears on page 15 of the Decision. Here, again, it appears “PDCCH” was intended.

specification relates to the **data** in the sub-frame transmitting the data, which is sent and received **after** the PDCCH. (See, e.g., EX1001, 6:35-40 (“the eNodeB carries, in downlink control information, a number value of the downlink sub-frame corresponding to the confirmation information which is fed back by one uplink sub-frame, and transmits data on a plurality of continuous downlink sub-frames **after** the sub-frame carrying the downlink control information”), 6:44-50 (“**after** the user equipment receives the downlink sub-frame which carries the downlink control information, the data is received from the downlink sub-frame which transmits the data after this downlink sub-frame”), 7:1-6 (“the eNodeB carries, in downlink control information (DCI), a number value of the downlink sub-frame corresponding to the confirmation information which is fed back by one uplink sub-frame, and transmits data on a plurality of continuous downlink sub-frames **after** the sub-frame carrying the DCI”), 7:10-14 (“**after** the UE receives the downlink sub-frame which carries the DCI, the data is received from the downlink sub-frame which transmits the data after this downlink sub-frame”), 8:23-28.)⁴

This understanding of the specification is reflected by the portion of the specification quoted and highlighted in the Decision. (Dec., 14-15 (quoting and highlighting EX1001, 4:18-31).) The language highlighted in yellow in the Decision

⁴ All emphasis added unless otherwise noted.

describes a first situation where the UE “fails to detect a physical downlink control channel” (i.e., PDCCH) and explains that the physical downlink control channel “correspond[s] to transmitted data in the sub-frame transmitting the data.” (EX1001, 4:18-31.) That is, the PDCCH does not necessarily transmit data but instead “correspond[s]” to data transmitted in a subframe. The language highlighted in light blue by the Board describes a second situation where the UE detects the PDCCH that corresponds to the “data in the sub-frame transmitting the data” but “fails to receive the data thereof.” (*Id.*) Here, “thereof” refers to the “data [sent] in the sub-frame transmitting the data”—not the PDCCH. (*Id.*) If **either** the first or second situation occurs, “the user equipment feeds back a negative acknowledgement message.” (*Id.*; *see also id.*, 3:37-41 (“feed back to an eNodeB whether data of a downlink sub-frame is correctly received”), 6:56-62 (same).)

PO’s expert, Dr. Robert Akl, has the same understanding of the specification. As Dr. Akl explained, (i) “the eNodeB...transmits data on a plurality of continuous downlink sub-frames **after** the sub-frame carrying the [downlink control information or “DCI”]” and (ii) the “user equipment receives the downlink sub-frame that carries the DCI **and then** the data from the downlink sub-frames.” (EX2001, ¶22 (citing EX1001, 3:43-54).) Dr. Akl went on to explain that “the UE feeds back a NACK” if “the UE fails to detect **either** the PDCCH corresponding to a downlink sub-frame or the data therefrom.” (*Id.* (citing EX1001, 4:18-23).) Again, consistent with Dr. Akl’s

explanation that the data is sent in a sub-frame after the DCI, “therefrom” here refers to the downlink sub-frame transmitting the data, not the PDCCH transmitting the DCI.

The Board’s determination that the claims “only recite[] ‘fails to detect,’ thus indicating that fails to receive is not encompassed by the claim,” is therefore flawed. (See Dec., 15.) With the understanding that the specification describes a situation where the UE fails to detect the PDCCH and a situation where the UE does not receive data sent after the PDCCH, either of which results in a NACK, it is clear that both situations are claimed. The “fails to detect” the PDCCH limitation in claims 1 and 9 were identified above in Section I. As for the “fails to receive” data limitation, claims 1 and 9 describe sending back confirmation information indicating whether the data (which is sent after the control information) is received:

- [1.pre] “enabling a user equipment to *feed back* to an eNodeB *whether data* of a downlink sub-frame *is correctly received*’;
- [1.b] “*after the user equipment receives the downlink sub-frame which carries the downlink control information, the data is received* from the downlink sub-frame which transmits the data after this downlink sub-frame, and *the confirmation information of receiving the data is fed back*”
- [9.pre-2] “in a situation that the user equipment detects the physical downlink control channel corresponding to the transmitted data in the sub-frame

transmitting the data, *the user equipment analyzes data in this downlink sub-frame, and feeds back an acknowledgement message as the confirmation information in a situation that the analysis is successful, otherwise, the negative acknowledgement message is fed back as the confirmation information.*

Accordingly, the Decision’s interpretation of the “fails to detect” limitation is based on a misapprehension of the claims and the specification of the ’881 patent. Based on the misapprehension, the Board has effectively interpreted “detect” to simply mean *receiving* data, even if the UE has no understand of what the received data is. (See *id.* (explaining that Malladi does not disclose the “fails to detect” limitation because, although incorrectly decoded such that the control information is missed, “the UE *has* the PDCCH”).) There is *no evidence* a POSITA would equate merely *receiving* PDCCH data as *detecting* the PDCCH, which requires decoded the data such that the UE knows the data constitutes the PDCCH. As such, there is no basis to exclude from the scope of the “fails to detect” limitation a UE that incorrectly decodes the PDCCH and misses the control information, as described in Malladi.

Other claim language confirms the Decision’s interpretation is unsupported by the ’881 patent. For example, claims 6, 9, and 11-14 describe “a situation that the user equipment detects the physical downlink control channel,” in which case the UE “analyzes the data.” Based on the specification, the UE is able to analyze the

data in this situation (as compared to the situation where the UE fails to detect the PDCCH) because the detected PDCCH includes control information about which subframes are transmitting data and the positions of the data. (EX1001, 10:9-15 (“The object UE detects the information of DCI format 0 on downlink sub-frame 6 and acquire that there is data being sent on downlink sub-frames 6, 7, 8 and 9, the object UE detects the corresponding downlink control channel on downlink sub-frames 6, 7, 8 and 9, to find the positions of the corresponding downlink data according to the downlink control channel for decoding.”).) That means that the claim term “detects” requires properly decoding the PDCCH to obtain the control information, because merely “hav[ing] the PDCCH” without more would not enable the UE to analyze the data.

B. Malladi Discloses “Fails to Detect,” Under a Proper Interpretation

As discussed in Section I.C, the Petition’s explanation that Malladi discloses the “fails to detect” limitation is not limited to the teaching of a UE that incorrectly decodes the PDCCH. As demonstrated in the Petition, Malladi’s teachings are much broader. Nevertheless, Malladi’s teaching of a UE that incorrectly decodes the PDCCH discloses the “fails to detect” limitation, if properly interpreted. Simply put, if the UE is unable to “decode[] the PDCCH” such that it “misses the control information,” then the UE fails to detect the PDCCH. (See Pet. at 17 (quoting EX1005, ¶[0061].)

C. Malladi Discloses “Fails to Detect,” Even Under the Board’s Interpretation

Even under the Board’s erroneous interpretation, the Petition explains how Malladi’s broad teaching of a UE that misses a PDCCH discloses the “fails to detect” limitation. That explanation is not limited to Malladi’s teachings of a UE that incorrectly decodes the PDCCH and misses the control information. See *CRFD Rsch., Inc. v. Matal*, 876 F.3d 1330, 1349 (Fed. Cir. 2017) (“A reference must be considered for everything that it teaches, not simply the described invention or a preferred embodiment.” (internal quotation marks and citation omitted).)

For example, in the Petition, the analysis of the “fails to detect” limitation begins by discussing Malladi’s 2-bit ACK information, where “[o]ne 2-bit value may indicate that *the control information is missed by the UE*.” (See Pet., 16-17 (quoting EX1005, ¶[0009]).) This discussion in the Petition includes no mention of incorrectly decoding the PDCCH. Nor does the quoted paragraph [0009] from Malladi mention incorrectly decoding the PDCCH. (See EX1005, ¶[0009].) Instead, this discussion in the Petition and in Malladi only mentions missing control information. As explained in the Petition, the PDCCH is the physical channel that transmits the control information, (see Pet., 14), which means the control information is missed if the PDCCH is missed (“fails to detect”), (*id.*, Pet., 16-17).

The Petition next explains that this “scenario where control information is

missed” discloses the “fails to detect” limitation: “The scenario where *control information is missed*, as described in Malladi, discloses ‘a situation that a user equipment fails to detect a physical downlink control channel.’” (*Id.*) Although the Petition later mentions Malladi’s discussion of incorrectly decoding the PDCCH as *one way* control information may be missed, here, the Petition clearly and explicitly sets forth that what it relies on as disclosing the “fails to detect” limitation is *any* “scenario where control information is missed.” (*Id.*)

The Petition goes on to discuss what happens in Malladi’s system “*if the PDCCH for a DL subframe is missed*, including sending a “2-bit value ‘[0, 0]’...as the ACK information.” (See Pet., 17 (citing EX1005, ¶¶[0085], [0086], [0094], [0108], [0110], [0111], Figs. 6, 8, 11, 12).) This discussion in the Petition likewise includes no mention of incorrectly decoding the PDCCH. It instead only mentions missing the PDCCH (“fails to detect”).

The paragraphs and figures of Malladi cited in this portion of the Petition—which the Board misapprehended or overlooked—confirm that Malladi teaches a UE that “fails to detect” the PDCCH transmitting the control information. For example, in each of paragraphs [0085], [0086], and [0094], Malladi describes a scenario where the UE *misses the PDCCH*. (EX1005, ¶¶[0085] (“Missed PDCCH”), [0086] (same), [0094] (“the UE misses the PDCCH”).) These paragraphs do not mention decoding. Indeed, following the Board’s logic, if the UE misses the PDCCH it cannot possibly

decode the PDCCH. (*See* Dec., 16 (“In order to decode a PDCCH, the PDCCH must first be detected.”))

The above-discussed portion of the Petition also cites Malladi’s paragraph [0108] and Figure 11. (*See* Pet., 17.) Referring to Figure 11, paragraph [0108] of Malladi describes the process blocks performed by the UE. (EX1005, ¶[0108].) In block 1112, the “UE may *determine whether control information for data is received* from an eNB.” (*Id.*) At block 1114, the “UE may also determine whether data is decoded correctly.” (*Id.*) Finally, at block 1116, the “UE may then generate ACK information *based on whether or not control information is received*, the content of the control information if received, and decoding results for the data.” (*Id.*) Malladi says nothing in paragraph [0108] or Figure 11 about decoding once the control information is “received.”

The Petition cites these teachings about not “receiv[ing]” control information for its conclusion that Malladi’s system feeds back ACK information when “*the PDCCH for a DL subframe is missed*” (“fails to detect”), (Pet., 17), because the PDCCH transmits the control information, (*id.*, 14). In other words, not “receiv[ing]” the control information means the PDCCH transmitting the control information was not received. (*See id.*, 14 (explaining that the “control information” is sent “on the PDCCH to the UE”).)

The above-discussed portion of the Petition also cites Malladi’s paragraph

[0111] and Figure 12. (See Pet., 17.) Referring to Figure 12, paragraph [0111] of Malladi describes a “module 1212 to *determine whether control information for data is received from an eNB*, a module 1214 to determine whether data is decoded correctly, and a module 1216 to generate ACK information *based on whether or not control information is received*, the content of the control information if received, and decoding results for the data.” (EX1005, ¶[0111].) Here, again, Malladi describes generating ACK information if the control information is not “received,” meaning the PDCCH transmitting the control information is not received, with no mention of decoding once the control information is “received.”

As another example, the above-discussed portion of the Petition cites Malladi’s paragraph [0110]. (See Pet., 17.) In this paragraph, Malladi explains that the “UE may generate a fixed number of bits for the ACK information regardless of *whether or not the control information is received*.” (EX1005, ¶[0110].) Malladi explains that the UE may “set the two bits to a first value (e.g., [0, 0]) if *the control information is not received*, and set the two bits to second, third or fourth value *if the control information is received*.” (*Id.*) As in the paragraphs discussed above, Malladi here describes generating ACK information if the control information is not “received,” meaning the PDCCH is not received, with no mention of decoding once the control information is “received.”

Thus, the Board is incorrect that the Petition “frames it’s discussion of Malladi

around a PDCCH that is improperly decoded.” (Dec., 15.) In actuality, as demonstrated above, the Petition frames its discussion of Malladi around the broad teachings of missing the PDCCH or not receiving control information, and refers to incorrectly decoding the PDCCH as one way control information may be missed.

The Board’s reliance on Malladi’s Figures 6 and 8 are misplaced. For example, referring to Figure 8, the Board explains (i) that, “[i]n order to reach item 846, the UE must first perform step 820, which says ‘Decode the PDCCH for possible assignment,’” and (ii) that, “[i]n order to decode a PDCCH, the PDCCH must first be detected.” (Dec., 16.) The Board’s analysis is flawed. Without any citation to Malladi’s specification, the Board assumes that block 820 requires first detecting the PDCCH. Malladi does not say that. What Malladi says is that “[b]lock 846 covers...scenario 3 in which the UE is scheduled but *misses the PDCCH*.” (EX1005, ¶[0101].) As explained in Malladi’s paragraph [0094], which is also cited in the above-discussed portion of the Petition, for “scenario 3, the eNB transmits an assignment for the UE on the PDCCH but the UE *misses the PDCCH*.” (*Id.*, ¶[0094].) These explicit teachings in Malladi do not limit “misses the PDCCH” to the scenario where the PDCCH is incorrectly decoded.

The Board’s analysis of Figure 6 is equally flawed. Figure 6 simply states that “[0, 0] = *Missed PDCCH*.” (*Id.*, Fig. 6.) Likewise, when describing Figure 6, Malladi explains that “[0, 0]” reflects a “*Missed PDCCH*.” (*Id.*, ¶¶[0085]-[0086].)

Malladi also explains, with reference to Figure 6, that “[0, 0]” conveys states “A1” and “B1.” (*Id.*, ¶¶[0087]-[0090].) According to Malladi, in these states, the “UE *missed the PDCCH* and *received no assignment*.” (*Id.*, ¶¶[0072]-[0083].) Again, unlike states “A2” through “A5” and “B2” through “B5,” which do mention “decoding,” states A1 and B1 say *nothing* about decoding. (*Id.*) That is because a PDCCH can be missed not only in the scenario where the PDCCH is incorrect decoding but also in the scenario where the PDCCH is never received, consistent with Malladi’s explanation here that missing the PDCCH means the UE “received no assignment.” (*Id.*)

The Board misapprehended or overlooked these broad teachings in Malladi regarding Figure 6. The Board instead cites Malladi’s paragraph [0061] to conclude “that ‘Missed PDCCH’ [in Figure 6] refers to one that was detected, but incorrectly decoded such that the control information is missed.” (Dec., 16-17.) But paragraph [0061] does not concern Figure 6, (*see* EX1005, ¶[0061]), which is first discussed starting at paragraph [0085], (*see id.*, ¶[0085]). It was therefore improper for the Board to limit Malladi’s broad teachings in connection with Figure 6 to Malladi’s discussion of one way a PDCCH may be missed in paragraph [0061].

III. CONCLUSION

For the reasons explained above, Petitioner’s rehearing request should be granted and IPR instituted.

Respectfully submitted,

Dated: November 13, 2023

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CERTIFICATE OF SERVICE

I hereby certify that on November 13, 2023, I caused a true and correct copy of the foregoing Petitioner's Request for Rehearing to be served by email at the following email addresses of record:

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