

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

TELEFONAKTIEBOLAGET LM ERICSSON,
Patent Owner.

IPR2022-00465
Patent 8,731,124 B2

Before GEORGIANNA W. BRADEN, NATHAN A ENGELS, and
SHARON FENICK, *Administrative Patent Judges*.

ENGELS, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. *Background*

Apple Inc. filed a Petition requesting an *inter partes* review of claims 1–5 and 7–11 of U.S. Patent No. 8,731,124 B2 (Ex. 1001, “the ’124 patent”). Paper 1, 1. Patent Owner filed a Preliminary Response. Paper 7 (“Prelim. Resp.”). Petitioner also submitted the Declaration of Dr. Apostolos K. Kakaes in support of the Petition. Ex. 1003.

An *inter partes* review may not be instituted unless it is determined that “the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314 (2018).

For the reasons set forth below, upon considering the parties’ arguments and the evidence of record, we conclude that the information presented in the Petition fails to establish a reasonable likelihood that Petitioner would prevail in showing the unpatentability of any of the challenged claims. Accordingly, we do not institute *inter partes* review.

B. *Real Parties in Interest*

Petitioner states that Apple Inc. is the real party in interest. Pet. 52. Patent Owner states that Telefonaktiebolaget LM Ericsson and Ericsson Inc. are the real parties in interest. Paper 3, 2.

C. *Related Proceedings*

Petitioner states that the ’124 patent was challenged in IPR2021-00732, which is now terminated. Pet. 52.

D. The '124 Patent (Ex. 1001)

The '124 patent describes systems and methods in which mobile devices use pseudo-random sequence generators to generate uplink reference signals that base stations use to demodulate uplink data. Ex. 1001, 1:14–16, 6:2–36. In particular, the '124 patent describes initializing a pseudo-random sequence generator using a single parameter having a range smaller than the range of possible initialization sequences used to generate an uplink reference signal. Ex. 1001, 9:29–10:21, Fig. 5.

E. Illustrative Claims

Claims 1 and 7 are independent claims. Claim 1 is illustrative and is reproduced below with bracketed labels added to reflect those references by Petitioner.

1. [preamble] A method implemented by a wireless device for initializing a pseudo-random sequence generator on which to base generation of an uplink reference signal, comprising:

[1.1] selectively deriving one of the initialization sequences within a subset of possible initialization sequences for the sequence generator, according to one or more rules that define different initialization sequences in the subset as a function of a single parameter, wherein the single parameter is received from a base station,

[1.2] wherein said deriving comprises deriving the initialization sequence based on a defined one-to-one mapping of possible initialization sequences in the subset to possible values for the single parameter,

[1.3] wherein the range of the single parameter is smaller than the range of the subset, and

[1.4] wherein said deriving comprises deriving the initialization sequence c_{init} according to

$$c_{init} = z + 2 \left\lfloor \frac{z}{30} \right\rfloor,$$

wherein z is the single parameter and $\lfloor x \rfloor$ denotes a floor function that rounds x to the nearest integer less than or equal to x ;

[1.5] generating the uplink reference signal with the sequence generator initialized to the derived initialization sequence; and

[1.6] transmitting the generated signal.

F. Asserted Challenges to Patentability

Petitioner challenges the patentability of claims 1–5 and 7–11 of the '124 patent based on the following basis:

Claim(s) Challenged	35 U.S.C. §	References/Basis
1–5, 7–11	103 ¹	36.211 ² , CATT ³

II. DISCUSSION

A. Level of Ordinary Skill in the Art

Petitioner contends that a person of ordinary skill in the art at the time of the alleged invention would have had “a Master’s degree in Electrical Engineering, Applied Mathematics, Computer Science, Physics, or an equivalent field and three to five years of experience working with wireless digital communications systems, including the communication layers of such systems.” Pet. 13 (citing Ex. 1003 ¶¶ 63–68). Patent Owner does not address the level of ordinary skill.

¹ The '124 patent’s earliest priority date falls after the Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, 125 Stat. 284 (2011), took effect. Thus, we apply the AIA version of § 103.

² “Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation,” 3GPP TS 36.211 Version 10.4.0 (Release 10). Ex. 1008.

³ “Further Details on UE-Specific UL DMRS,” 3GPP TSG RAN WG1 #68 Meeting R1-120106, submitted by CATT. Ex. 1009.

For purposes of this Decision, we apply Petitioner’s assessment of the level of ordinary skill.

B. Principles of Law

A claim is unpatentable under 35 U.S.C. § 103 if “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). In an *inter partes* review, the petitioner must show with particularity why each challenged claim is unpatentable. *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016); 37 C.F.R. § 42.104(b).

C. Alleged Obviousness in View of 36.211 and CATT

Petitioner states that both 36.211 and CATT are technical documents from the 3rd Generation Partnership Project (“3GPP”). Pet. 1–2, 13, 15. Petitioner states 36.211 is a technical specification “describing technical features related to physical channels and modulation of LTE networks.” Pet. 13. Petitioner cites 36.211 as disclosing generation of uplink signals based on the initialization of a pseudo-random sequence generators. Pet. 22–23. As cited by Petitioner, 36.211 includes equations that define a range of possible initialization sequences, which Petitioner contends are functions of a single parameter, the physical layer cell ID. Pet. 24.

Petitioner cites CATT as a 3GPP technical document that proposes improvements to uplink reference signaling. Pet. 15. As cited by Petitioner (Pet. 20, 29, 32), CATT states that “a virtual cell ID can be introduced to replace the current service cell ID,” which Petitioner interprets as the physical layer cell ID of 36.211. Ex. 1009, 1. Citing that statement among

other reasons, Petitioner proposes combining CATT's virtual cell ID in place of the physical layer cell ID in 36.211. Pet. 32.

D. Analysis of Claims 1–5 and 7–11: “wherein the range of the single parameter is smaller than the range of the subset”

Independent claims 1 and 7 recite “wherein the range of the single parameter is smaller than the range of the subset.” For “the range of the subset [of possible initialization sequences],” Petitioner contends the 36.211 discloses a range of initialization sequences of 0 to 535. Pet. 31 (citing Ex. 1003 ¶ 90).

For the “single parameter,” Petitioner cites CATT's virtual cell ID (Pet. 32), but CATT does not identify a range of values for the virtual cell ID. Petitioner instead cites 36.211's teachings that its physical layer cell ID can have a value between 0 and 503. Pet. 30 (citing Ex. 1008, § 6.11). Petitioner argues “[b]ecause the virtual cell ID ‘replace[s]’ the current serving cell ID—which can be represented by 9 bits—the virtual cell ID is also 9 bits.” Pet. 32 (citing Ex. 1009, 1). Petitioner's declarant, Dr. Kakaes, provides essentially the same statement: “‘Replacing’ the current serving cell ID, which is represented by 9 bits, would also mean that the virtual cell ID would be 9 bits.” Ex. 1003 ¶ 95.

Critically, though, neither Petitioner nor Dr. Kakaes cite evidence to establish a range of values for the virtual cell ID. Without supporting evidence, Petitioner and Dr. Kakaes interpret CATT's use of the word “replace” to suggest or assume that the range of the virtual cell ID would be the same as that of the physical layer cell ID. Pet. 32; Ex. 1003 ¶ 95. Patent

Owner, however, cites evidence to rebut that assumption. Prelim. Resp. 3, 34–37 (citing Ex. 2001, 2 (“CATT II”)⁴).

CATT II is also a 3GPP publication, notably from the same working group as CATT. Ex. 1009, 1 (identifying the working group “TSG RAN WG1”); Ex. 2001, 1 (same); *see* Pet. 2 (describing the 3GPP’s “Technical Specification Groups (TSGs)” and “Radio Access Network WG1”).

CATT II describes the working group’s November 14–18, 2011, Meeting #67, while CATT describes the working group’s February 6–10, 2012, Meeting #68. Ex. 2001, 1; Ex. 1009, 1. CATT refers to CATT II as reference [2]. Ex. 1009, 3. And in particular, CATT refers to CATT II in the sentence cited by Petitioner and Dr. Kakaes regarding “replacing” the serving cell ID: “Similar to the method described in [2], a virtual cell ID can be introduced to replace the current service cell ID” Ex. 1009, 1.

Unlike CATT, CATT II addresses the range of values of the virtual cell ID. CATT II states “it is beneficial to allow the virtual-Cell-ID to be configured within or outside the range of current Cell IDs.” Ex. 2001, 2 (“CATT II”). And CATT II expressly states that “an example of the range of the virtual-Cell-ID can be {0, 1 . . . 1023}.” Ex. 2001, 2.

The range of 0 to 1023 would not be smaller than Petitioner’s cited range of initialization sequences from 0 to 535, but perhaps more importantly, Patent Owner’s evidence highlights the lack of evidence supporting Petitioner’s arguments regarding the “range” limitations. Indeed, Petitioner has not cited evidence to establish a range of values of CATT’s virtual cell ID, and Petitioner’s and Dr. Kakaes’ unsupported statements are

⁴ “Considerations on UE-Specific DM-RS Configuration,” 3GPP TSG RAN WG1 Meeting #67, R1-113732, submitted by CATT. Ex. 2001.

insufficient to establish that the proposed combination satisfies the “range” limitations of claims 1 and 7. Accordingly, we determine Petitioner has not shown a reasonable likelihood of prevailing in its challenge to any of claims 1–5 and 7–11, each of which includes a “range” limitation.

E. Discretionary Denial

Because we deny the Petition on the merits, we do not reach Patent Owner’s arguments for discretionary denial under 35 U.S.C. § 325(d). *See* Prelim. Resp. 38–44.

III. CONCLUSION

For the foregoing reasons, we are not persuaded that the Petition establishes a reasonable likelihood that Petitioner would prevail in its challenge to claims 1–5 and 7–11 of the ’124 patent.

IV. ORDER

In consideration of the foregoing, it is hereby ordered that the Petition is *denied*, and no trial is instituted.

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