

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

TELEFONAKTIEBOLAGET LM ERICSSON,
Patent Owner.

IPR2022-00648
Patent 9,860,044 B2

Before NATHAN A. ENGELS, SHARON FENICK, and
STEPHEN E. BELISLE, *Administrative Patent Judges*.

ENGELS, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. Background

Apple Inc. (“Petitioner”) filed a Petition requesting an *inter partes* review of claims 1–11, 15–27, and 33–41 of U.S. Patent No. 9,860,044 B2 (Ex. 1001, “the ’044 patent”). Paper 1, 1 (“Pet.”). Petitioner also filed the Declaration of Apostolos K. Kakaes, Ph.D. in support of the Petition. Ex. 1003. Telefonaktiebolaget LM Ericsson (“Patent Owner”) filed a preliminary response. Paper 8 (“Prelim. Resp.”).

As stated in 35 U.S.C. § 314, an *inter partes* review may not be instituted unless it is determined that “the information presented in the petition . . . 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.” For the reasons below, we determine the information presented in the Petition shows a reasonable likelihood that Petitioner would prevail in showing the unpatentability of at least one claim of the ’044 patent, and we institute *inter partes* review.

B. Real Parties in Interest

Petitioner states that Apple Inc. is the real party in interest. Pet. 82. Patent Owner states that Telefonaktiebolaget LM Ericsson and Ericsson Inc. are the real parties in interest. Paper 3, 2.

C. Related Proceedings

The parties do not identify any related matters. Pet. 82; Paper 3, 2.

D. The ’044 Patent (Ex. 1001)

The ’044 patent describes systems and methods for implementing carrier aggregation in mobile communication systems. Ex. 1001, 1:16–30, code (57). In particular, the ’044 patent describes “an efficient resource

allocation for the physical uplink control channel for carrier aggregation.”
Ex. 1001, 1:18–19.

The ’044 patent states that then-current Long Term Evolution (“LTE”) technology included LTE Release 8 (“Rel 8”) with bandwidths up to 20 MHz using single component carriers, but that a then-proposed LTE Release 10 (“LTE-Advanced” or “LTE-A”) would allow aggregation of multiple component carriers to achieve bandwidths up to 100 MHz (e.g., five LTE Rel 8 20 MHz component carriers). Ex. 1001, 1:23–30, 8:14–22, Fig. 8; Ex. 1003 ¶ 41. “In order to support bandwidths greater than 20 MHz, carrier aggregation will be supported in LTE Rel 10. To maintain backward compatibility with Rel 8 user terminals . . . , the available spectrum is divided into Rel-8 compatible component carriers (e.g., 20 Mhz component carriers)” Ex. 1001, 8:14–18.

One consideration for carrier aggregation is how to configure the physical uplink control channel (“PUCCH”) for uplink (“UL”) control signaling from user equipment (“UE”). Ex. 1001, 8:37–39. According to some embodiments of the ’044 patent, the PUCCH resources on a single UL component carrier are used to support downlink (“DL”) transmissions on several downlink component carriers. Ex. 1001, 8:47–50.

E. Representative Claim

Of the challenged claims, claims 1, 17, 18, and 33 are independent claims. Claim 1 is reproduced below, with numbering added to reflect the limitation numbering in the parties’ briefs.

1. A method implemented by a base station of receiving control information from a user terminal, the method comprising:

- [1.1] scheduling downlink transmissions to a first user terminal only on a single downlink component carrier associated with a primary cell and scheduling downlink transmissions to a second user terminal on multiple downlink component carriers or on a downlink component carrier associated with a non-primary cell;
- [1.2] receiving, on a first set of radio resources, control information associated with the downlink transmissions to the first user terminal, wherein the first set of radio resources is reserved for a user terminal scheduled to receive downlink transmissions only on a single downlink component carrier associated with the primary cell; and
- [1.3] receiving, on a second set of radio resources, control information associated with the downlink transmissions to the second user terminal, wherein the second set of radio resources is reserved for a user terminal scheduled to receive downlink transmissions on multiple downlink component carriers or on a downlink component carrier associated with a non-primary cell, the first and second sets of radio resources being on a same uplink component carrier associated with the primary cell.

F. Asserted Challenges to Patentability

Petitioner challenges the patentability of claims 1–11, 15–27, and 33–41 of the '044 patent on the following grounds:

Claim(s) Challenged	35 U.S.C. §	References/Basis
1–11, 15–27, 33–41	103 ¹	Motorola, ² TS36.211, ³ TS36.213 ⁴
1–11, 15–27, 33–41	103	Motorola, TS36.211, TS36.213, TR36.912 ⁵

II. ANALYSIS

A. Obviousness

A claim is unpatentable as obvious 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) (quoting 35 U.S.C. § 103(a)). We resolve the question of obviousness based on underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the prior art and the claims; (3) the level of skill in the art; and (4) when in evidence, objective indicia of

¹ The '044 patent's earliest priority date falls before the Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, 125 Stat. 284 (2011), took effect. Thus, we apply the pre-AIA version of § 103.

² 3GPP R1-090792, “Control [Signaling] Design for Supporting Carrier Aggregation,” Motorola, RANI#56, February 9–13, 2009. Ex. 1007 (“Motorola”).

³ 3GPP TS 36.211 v.8.5.0 (2008). Ex. 1009 (“TS36.211”).

⁴ 3GPP TS 36.213 v.8.5.0 (2008). Ex. 1011 (“TS36.213”).

⁵ 3GPP TS 36.912 v.9.0.0 (2009). Ex. 1021 (“TS36.912”).

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