

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC. AND ZTE (USA) INC.,
Petitioner,

v.

INVT SPE LLC,
Patent Owner.

Case IPR2018-01477
Patent 7,848,439 B2

Before THU A. DANG, KEVIN F. TURNER, and BARBARA A. BENOIT,
Administrative Patent Judges.

BENOIT, *Administrative Patent Judge.*

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

I. INTRODUCTION

This is a preliminary proceeding to decide whether to institute *inter partes* review of U.S. Patent No. 7,848,439 B2 (Ex. 1001, “the ’439 patent” or “the challenged patent”). *See* 35 U.S.C. § 314(a); 37 C.F.R. § 42.4(a) (delegating authority to institute trial to the Board). Institution of an *inter partes* review is authorized by statute when “the information presented in the petition . . . and any response . . . 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(a).

Apple Inc. and ZTE (USA) Inc. (collectively, “Petitioner”) filed a petition seeking *inter partes* review of claims 1–11 of U.S. Patent No. 7,848,439 B2. Paper 1 (“Pet.”). Patent Owner, INVT SPE LLC, filed a Preliminary Response. Paper 7 (“Prelim. Resp.”). After receiving authorization (Paper 8), Petitioner filed a Reply (Paper 9) to address Patent Owner’s argument that institution should be denied for efficiency reasons, and Patent Owner filed a Sur-Reply (Paper 10).

Upon consideration of the Petition and the Preliminary Response, we conclude the information presented does not show a reasonable likelihood that Petitioner would prevail in establishing the unpatentability of any of the challenged claims. Accordingly, we deny institution of an *inter partes* review.

A. *Related Matters*

As required by 37 C.F.R. § 42.8(b)(2), each party identified various judicial or administrative matters that would affect or be affected by a decision in this proceeding. Pet. 47; Paper 4 (Patent Owner’s Mandatory

Notice), 2–3. Patent Owner identifies a petition, filed on August 22, 2018 by a different petitioner, challenging claims 1–8 of the ’439 patent and applying some of the same references as asserted here. Paper 4, 2 (identifying IPR2018-01555); *see* IPR2018-01555, Paper 1, 3 (“Grounds of Challenge”).

B. The Challenged Patent

The ’439 patent, titled “Communication Apparatus, Communication System, and Communication Method,” describes techniques for adaptive modulation and coding that result in improved spectrum usage in mobile communications. Ex. 1001, Abstract, [54], 1:10–26.

1. The Written Description

The patent describes techniques for a wireless communication orthogonal frequency division multiplexing (OFDM) system that transmits high-speed data using a large number of subcarrier frequency bandwidths. Ex. 1001, Abstract, 1:10–26; *see id.* at 1:10–14 (indicating the present invention relates to techniques for “carrying out adaptive modulation and coding [“AMC”] in adaptive transmission technology in subcarrier communication systems—that is, in wireless communication orthogonal frequency division multiplexing (OFDM) system[s]”). The patent explains the “concept of AMC is to change modulation and coding parameters in transmission based on channel characteristics at [the] current time.” *Id.* at 1:65–67. “With OFDM, adaptivity . . . refers to adaptivity at two domains of time domain and frequency domain.” *Id.* at 1:67–2:2.

The patent identifies two types of AMC used in conventional OFDM. *Id.* at 2:3. The first type of AMC is adaptivity based on individual OFDM

subcarriers, which is difficult to implement due to the number of subcarriers. *Id.* at 2:3–12. The second type of AMC in OFDM based adaptivity on groups of subcarriers and the groups are called subbands. *Id.* at 2:12–21. The patent indicates that in prior art subband AMC: “a subband indicates a subcarrier group comprised of subcarriers in neighboring positions on the frequency domain.” *Id.* at 2:19–21. The conventional method of adaptivity based on subbands (groups of subcarrier) reduced the difficulty of implementing adaptivity and reduced feedback overhead. *Id.* at 4:56–60. But, these conventional methods were not able “to effectively utilize diversity performance between subbands,” which the patent indicates “is an important method for improving wireless transmission quality.” *Id.* at 4:56–60.

The patent describes creating subband groups based on a predefined rule and selecting a modulation and coding scheme for the entire subband group, instead of doing so for a subband (group of subcarriers). *Id.* at 5:39–45; 8:57–60 (“On the receiving side, differences with subband adaptivity of the related art shown in FIG. 4B is that the unit of adaptive demodulation and coding is a subband group rather than a subband.”). The patent provides three examples of how subbands are to be grouped (combining neighboring subbands, combining subbands spaced at intervals, and combining all of the subbands) and indicates additional methods may be used. *Id.* at 10:29–33.

2. *The Challenged Claims*

Petitioner challenges the eleven claims in the '439 patent, of which claims 1, 8, 9, 10, and 11 are independent. Claims 1 and 8, reproduced

below with brackets noting Petitioner's identifiers, are illustrative of the claimed subject matter:

1. A communication apparatus comprising:
 - [1a] a channel estimating section that carries out a channel estimation per subband;
 - [1b] a parameter deciding section that decides modulation parameters and coding parameters per subband group comprised of a plurality of the subbands, based on a result of the channel estimation per subband;
 - [1c] a parameter information transmission section that transmits, to a communicating party, parameter information indicating the modulation parameters and the coding parameters decided at the parameter deciding section;
 - [1d] a receiving section that receives a signal containing data modulated and encoded on a per subband group basis at the communicating party using the modulation parameters and the coding parameters of the parameter information transmitted at the parameter information transmission section;
 - [1e] a data obtaining section that demodulates and decodes the received signal received at the receiving section on a per subband group basis using the modulation parameters and the coding parameters decided at the parameter deciding section, and obtains the data contained in the received signal; and
 - [1f] a pattern storage section that stores in advance patterns for selecting subbands constituting the subband groups wherein the parameter deciding section decides the modulation parameters and the coding parameters per subband group comprised of the subbands selected based on the patterns stored in the pattern storage section.

Ex. 1001, 12:65–13:27.

8. A communication apparatus comprising:
 - [8a] a channel estimating section that carries out a channel estimation per subband;

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