

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ERICSSON INC. AND TELEFONAKTIEBOLAGET LM ERICSSON,
Petitioner,

v.

INTELLECTUAL VENTURES II LLC,
Patent Owner.

Cases IPR2015-01664
Patent 7,787,431 B2

Before JAMESON LEE, JUSTIN BUSCH, and J. JOHN LEE,
Administrative Patent Judges.

BUSCH, *Administrative Patent Judge.*

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

A. *Background*

Ericsson Inc. and Telefonaktiebolaget LM Ericsson (“Petitioner”) filed a Petition, Paper 2 (“Petition” or “Pet.”), requesting an *inter partes* review of claims 8–12 and 18–22 (“the challenged claims”) of U.S. Patent No. 7,787,431 B2, Ex. 1001 (“the ’431 patent”). On February 11, 2016, we instituted an *inter partes* review of the challenged claims. Paper 7

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(“Institution Decision” or “Dec.”). Intellectual Ventures II LLC (“Patent Owner”) filed a Patent Owner Response (“PO Resp.”) on May 9, 2016. Paper 13. Petitioner filed a Reply. Paper 15 (“Reply”). An oral hearing was held on October 6, 2016.¹

We have jurisdiction under 35 U.S.C. § 6, and this Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine Petitioner has not shown by a preponderance of the evidence that claims 8–12 and 18–22 are unpatentable.

B. Related Proceedings

The parties indicate the ’431 patent is at issue in ten district court proceedings involving numerous parties. Pet. 1; Paper 5, 2–3. The ’431 patent also was the subject of another *inter partes* review: IPR2014-01195 (“1195 IPR”). Pet 1; Paper 5, 3. The petition in the 1195 IPR challenged claims 1, 2, 8–12, and 18–22. 1195 IPR, Paper 2, 1. The Board instituted review of claims 1 and 2, but did not institute review of claims 8–12 and 18–22 in the 1195 IPR. 1195 IPR, Paper 11, 18. The Board held claims 1 and 2 to be unpatentable. 1195 IPR, Paper 37, 27.

C. The ’431 Patent

The ’431 patent relates to multi-carrier communication systems and methods with variable channel bandwidth. Ex. 1001, Abstract.

The challenged claims recite methods performed by base stations for generating information-bearing signals, wherein the information-bearing signals include a primary preamble having certain properties. *Id.* at 9:33–10:9, 11:54–12:27, 13:4–47.

¹ The record includes a transcript of the oral hearing. Paper 23 (“Tr.”).

D. Illustrative Claim

Of the challenged claims, claims 8 and 18 are independent. Claim 8 is illustrative and reproduced below:

8. A cellular base station comprising:
- circuitry configured to transmit a broadcast channel in an orthogonal frequency division multiple access (OFDMA) core-band, wherein the core-band is substantially centered at an operating center frequency and the core-band includes a first plurality of subcarrier groups, wherein each subcarrier group includes a plurality of subcarriers, wherein the core-band is utilized to communicate a primary preamble sufficient to enable radio operations, the primary preamble being a direct sequence in the time domain with a frequency content confined within the core-band or being an OFDM symbol corresponding to a particular frequency pattern within the core-band,
- wherein properties of the primary preamble comprise:
- an autocorrelation having a large correlation peak² with respect to sidelobes;
 - a cross-correlation with other primary preambles having a small cross-correlation coefficient with respect to power of other primary preambles; and
 - a small peak-to-average ratio; and
- wherein a large number of primary preamble sequences exhibit the properties; and
- circuitry configured to transmit control and data channels using a variable band including a second plurality of subcarrier groups, wherein the variable band includes at least the core-band.

² A certificate of correction was issued on August 31, 2010, to replace the word “creak” with the word “peak.” Ex. 1001, 20.

E. The Evidence Relied Upon By Petitioner

Petitioner relies upon the following prior art references as its basis for challenging claims 8–12 and 18–22 of the '431 patent.³

| Reference | Patents/Printed Publications | Exhibit |
|------------------|---|----------------|
| Dulin | U.S. Patent Pub. 2002/0055356 A1 (May 9, 2002) | 1002 |
| Zhuang | U.S. Patent No. 7,426,175 B2 (September 16, 2008) | 1004 |
| Yamaura | U.S. Patent No. 7,782,750 B2 (August 24, 2010) | 1003 |
| Hwang | I. Hwang et al., <i>A New Frame Structure for Scalable OFDMA Systems</i> , (March 11, 2004) | 1005 |

1. Dulin (Ex. 1002)

Dulin describes systems and methods for scheduling and synchronizing data transmission between base stations and subscriber units (or terminal stations). Ex. 1002, Abstract. One aspect of Dulin describes generating a frame map that is sent to subscriber units to inform the subscriber units which subscriber units are authorized to send or receive a transmission in each frequency block and time slot. *Id.* ¶ 65.

2. Yamaura (Ex. 1003)

Yamaura describes a method, and apparatuses for implementing the method, of radio communication “for exchanging information between a base station and a terminal station.” Ex. 1003, Abstract. The described method communicates multi-carrier signals using OFDM modulation, “including plural subcarriers within a bandwidth, communicating control signals in addition to the information between the base station and the terminal station, and wherein part of the control signals . . . is transmitted by

³ Petitioner also proffers the Declarations of Zygmunt J. Haas, Ph.D. See Exs. 1012, 1020. Other testimony relied on in this proceeding are the Declaration of Kenneth Zeger, Ph.D., Ex. 2001; the deposition testimony of Dr. Zeger, Ex. 1018; and the deposition testimony of Dr. Haas, Ex. 2003.

one or more specific subcarriers in the bandwidth for the multi-carrier signals.” *Id.*

3. *Zhuang (Ex. 1004)*

Zhuang describes optimizing the auto-correlation properties of each pilot signal, and the cross-correlation properties between pilot signals, through the use of certain chirp sequences. Ex. 1004, 2:7–29.

4. *Hwang (Ex. 1005)*

Hwang describes a new frame structure and carrier-allocation methods that an OFDM-modulated system can implement to improve system performance under scalable bandwidth. Ex. 1005, 1. Hwang describes system parameters for implementing an OFDMA system that scales its operating channel bandwidth from 2.5 MHz to 20 MHz. *Id.* at 2–3. Hwang further describes grouping subcarriers into bins as a basic allocation unit of subcarriers to a channel. *Id.* at 3–4, 8.

II. ANALYSIS

A. Claim Construction

In an *inter partes* review, claim terms of an unexpired patent are given their broadest reasonable interpretation in light of the specification in which they appear and the understanding of others skilled in the relevant art. *See* 37 C.F.R. § 42.300(b); *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1275–79 (Fed. Cir. 2015). Applying that standard, we interpret the claim terms of the ’431 patent according to their ordinary and customary meaning in the context of the patent’s written description. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007) (quoting *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc)).

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