

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.

Case IPR2014-01185
Patent 7,269,127 B2

Before JUSTIN BUSCH, PETER P. CHEN, and J. JOHN LEE,
Administrative Patent Judges.

CHEN, *Administrative Patent Judge.*

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

I. INTRODUCTION

Ericsson Inc. and Telefonaktiebolaget LM Ericsson (“Petitioner”) filed a Petition requesting an *inter partes* review of claims 1–10, 17, 20, 21, 23, and 24 of U.S. Patent No. 7,269,127 (Ex. 1001, “the ’127 patent”). Paper 2 (“Pet.”). Intellectual Ventures II LLC (“Patent Owner”) filed a Preliminary Response. Paper 10 (“Prelim. Resp.”). On January 28, 2015, we instituted an *inter partes* review of claims 1–10 and 17, but we did not institute an *inter partes* review of claims 20, 21, 23, and 24. Paper 11 (“Dec. to Inst.”).

After institution of trial, Patent Owner filed a Patent Owner Response (Paper 19, “PO Resp.”), to which Petitioner filed a Reply (Paper 22, “Pet. Reply”). Patent Owner filed a Motion for Observations on the Cross-Examination of Zygmunt Haas, Ph.D. (Paper 27), to which Petitioner responded (Paper 31). An oral hearing was held on October 21, 2015. The transcript of the consolidated hearing has been entered into the record. Paper 34 (“Tr.”).

The Board has statutory authority under 35 U.S.C. § 6(c). In this Final Written Decision, issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73, we determine Petitioner has shown by a preponderance of the evidence that claims 1–10 and 17 of the ’127 patent are unpatentable.

A. *Related Proceedings*

According to Petitioner, the ’127 patent is involved in the following district court cases: *Intellectual Ventures I LLC, et al. v. AT&T Mobility*

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LLC et al., 1-13-cv-01668 (D. Del.); *Intellectual Ventures I LLC, et al. v. Leap Wireless Int'l et al.*, 1-13-cv-01669 (D. Del.); *Intellectual Ventures I LLC, et al. v. Nextel Operations et al.*, 1-13-cv-01670 (D. Del.); *Intellectual Ventures I LLC, et al. v. T-Mobile USA Inc. et al.*, 1-13-cv-01671 (D. Del.); and *Intellectual Ventures I LLC, et al. v. U.S. Cellular Corp.*, 1-13-cv-01672 (D. Del.).

B. The '127 Patent

The '127 patent is titled, “Preamble Structures for Single-Input, Single-Output (SISO) and Multi-Input, Multi-Output (MIMO) Communication Systems.” The subject matter of the challenged claims of the '127 patent relates generally to increased operating efficiency in wireless communication systems, and, in particular, to preamble structures in multi-input, multi-output (MIMO) wireless communication systems with two or more transmit and receive antennas, and single-input, single-output (SISO) wireless systems with one transmit and one receive antenna. Ex. 1001, 1:29–40, 3:21–24. In MIMO wireless communications systems, signals are pre-processed to avoid interference from other signals in common communications channels or paths. *Id.* at 1:54–57. Pre-processing techniques can include using frame structures, which are comprised of preamble structures and data structures. *Id.* at 1:58–63. An efficient preamble structure for use in wireless communications systems should provide for both synchronization of data symbols and estimation of parameters such as noise variance and other parameters. *Id.* at 2:56–62.

Figure 1 of the '127 patent is reproduced below.

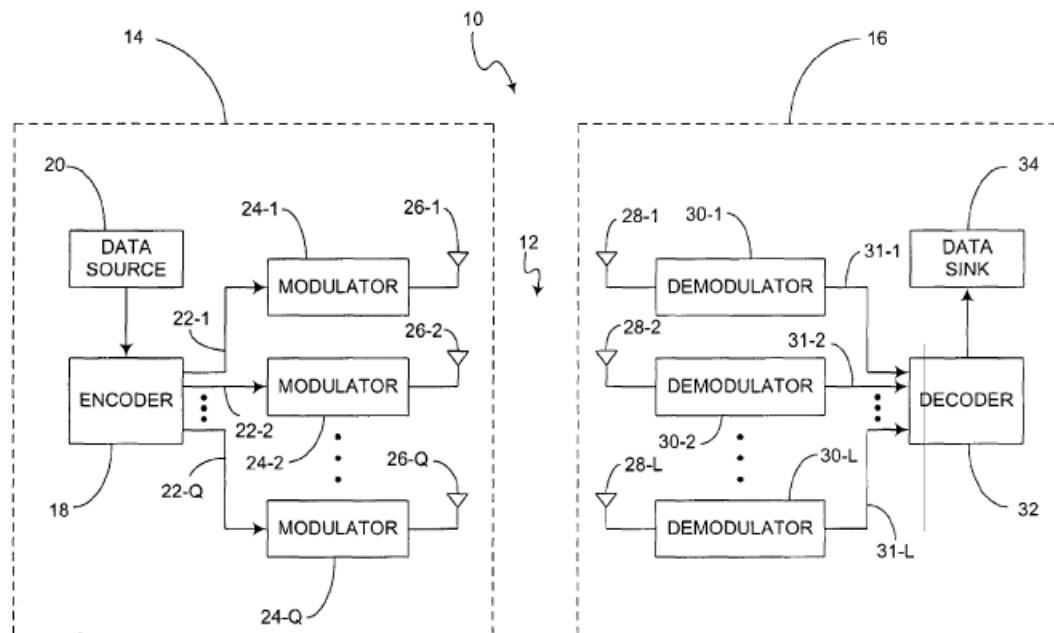


FIG. 1

Figure 1 is a block diagram of exemplary MIMO communication system 10. *Id.* at 4:3–4, 39–40. MIMO system 10 may be implemented as a wireless system for transmission from transmitter 14 across wireless channel 12 to receiver 16. *Id.* at 4:43–46, 5:8–10. Transmitter 14 includes encoder 18, which typically encodes data and/or other types of signals received, for example, from data source 20. *Id.* at 5:13–15.

A MIMO communication system may employ various signal modulation and demodulation techniques, including orthogonal frequency division multiplexing (OFDM). *Id.* at 4:58–62. Modulators 24-1 to 24-Q modulate signals for transmission using, for example, OFDM techniques. *Id.* at 5:31–35. In particular, modulators 24 include an inverse discrete

Fourier transform (IDFT) stage that receives a parallel format of training blocks and data blocks and converts them from the frequency domain to the time domain. *Id.* at 8:1-5. Within the modulator, the converted signals are input to an amplifier and then to transmit antennas 26-1 to 26-Q, which transmit the signals across channel 12. *Id.* at 8:31–34.

Data or information (e.g., voice, video, audio, text) can be transmitted as data symbols organized into data structures. *Id.* at 1:64–2:1. Training symbols are typically added as prefixes to data structures, to enable synchronization between transmitters and receivers of a communications system. *Id.* at 2:10–14. These training symbols can be referred to as preambles and are part of the preamble structures. *Id.* at 2:14–15. The preamble structure can contain an enhanced training symbol, which is divided into sections to perform synchronization and channel parameter estimation functions. *Id.* at 11:2–8.

Pilot symbols “have the same structure as preambles. However, instead of being placed as a prefix to the data structure, the pilot structures are periodically arranged within groups of data symbols.” *Id.* at 2:17–22. Figure 2 of the ’127 patent is reproduced below.

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