

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MARVELL SEMICONDUCTOR, INC.,
Petitioner,

v.

INTELLECTUAL VENTURES I LLC,
Patent Owner.

Case IPR2014-00553
Patent 6,754,195 B2

Before THOMAS L. GIANNETTI, JAMES A. TARTAL, and
PATRICK M. BOUCHER, *Administrative Patent Judges*.

BOUCHER, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. *Background*

Marvell Semiconductor, Inc. (“Petitioner”) filed a substitute corrected Petition (Paper 13, “Pet.”) pursuant to 35 U.S.C. §§ 311–319 to institute an *inter partes* review of claims 1–23 of U.S. Patent No. 6,754,195 (“the ’195

patent”). After consideration of a Preliminary Response (Paper 15) filed by Intellectual Ventures I LLC (“Patent Owner”) and a Request for Rehearing filed by Petitioner, the Board instituted trial with respect to claims 1–23 on February 20, 2015. Paper 19.

During the trial, Patent Owner timely filed a Patent Owner Response (Paper 31, “PO Resp.”), and Petitioner timely filed a Reply to the Patent Owner Response (Paper 43, “Reply”). Patent Owner also filed observations on the cross-examination of Petitioner’s Witness, Kevin Almeroth, Ph. D. (Paper 52), and Petitioner filed a response to Patent Owner’s observations (Paper 55). An oral hearing was held on September 11, 2015. Paper 56.

We have jurisdiction under 35 U.S.C. § 6(c). This Decision is a Final Written Decision under 35 U.S.C. § 318(a) as to the patentability of the claims on which we instituted trial. Based on the record before us, Petitioner has shown, by a preponderance of the evidence, that claims 1–3, 5, 6–10, 13, 18, and 23 of the ’195 patent are unpatentable.

B. Related Proceedings

The parties identify the following civil actions involving the ’195 patent: *Intellectual Ventures I LLC v. Canon Inc.*, 1:13-cv-473 (D. Del.); *Intellectual Ventures I LLC v. Ricoh Americas Corp.*, 1:13-cv-474 (D. Del.); and *Intellectual Ventures I LLC v. Nikon Corp.*, 1:11-cv-1025 (D. Del.). Pet. 1; Paper 8, 2. The ’195 patent is also the subject of IPR2014-00552, in which we instituted trial with respect to claims 1–23 on December 3, 2014. *Marvell Semiconductor, Inc. v. Intellectual Ventures I LLC*, Case IPR2014-00552, slip op. (PTAB Dec. 3, 2014) (Paper 16).

C. The '195 Patent (Ex. 1101)

According to the '195 patent, different wireless protocols, such as the 802.11a and 802.11b protocols defined by the Institute of Electrical and Electronics Engineers, Inc. ("IEEE"), may be incompatible, particularly as a result of their operation in different frequency bands. Ex. 1001, col. 1, ll. 21–33. The '195 patent addresses this incompatibility by providing a mixed-waveform configuration that includes a first portion modulated according to a single-carrier scheme with a preamble and header, and a second portion modulated according to a multi-carrier scheme. *Id.* at col. 2, ll. 44–52.

Figure 3 of the '195 patent is reproduced below.

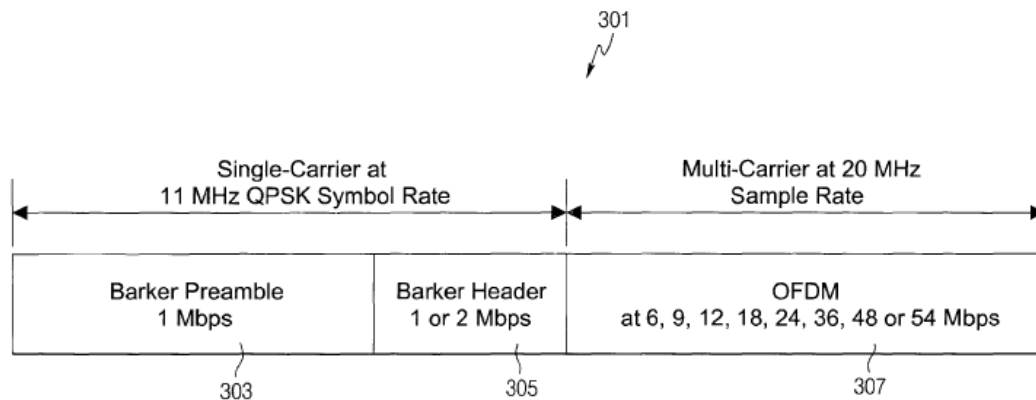


FIG. 3

Figure 3 illustrates a mixed-signal packet disclosed by the '195 patent. Packet 301 includes Barker preamble 303 and Barker header 305 that are transmitted with a single carrier, and includes one or more orthogonal frequency-division multiplexing ("OFDM") symbols 307 with multi-carrier modulation. *Id.* at col. 7, ll. 23–32. Notably, the packet does not include an

OFDM preamble, although the disclosure asserts that “it may still be present for both convenience and fine tuning.” *Id.* at col. 5, ll. 32–33.

In either case, equalizer information obtained during acquisition of the single-carrier portion may be reused, enabling “complete continuity between the two signal segments, including AGC (power), carrier phase, carrier frequency, timing and spectrum (multi-path).” *Id.* at col. 5, ll. 39–41. Specifically, the signal is specified so that an estimate of the channel impulse response obtained on the single-carrier portion, i.e., on the preamble and header, is reusable on the multi-carrier portion, i.e., on the OFDM symbols. *Id.* at col. 7, ll. 44–47.

D. Illustrative Claim

Claim 1, the only independent claim of the ’195 patent, is illustrative of the claims at issue:

1. A wireless communication system that is configured to communicate using a mixed waveform configuration, comprising:
 - a transmitter configured to transmit according to a mixed waveform configuration including a first portion modulated according to a single-carrier scheme with a preamble and header and a second portion modulated according to a multi-carrier scheme;
 - the waveform being specified so that a channel impulse response estimate obtainable from the first portion is reusable for acquisition of the second portion; and
 - a receiver configured to acquire and receive packets with a mixed waveform configuration.

E. Grounds of Unpatentability

Petitioner relies on the following references.

Böhnke	US 6,567,374 B1	May 20, 2003	Ex. 1113
Agee	US 6,128,276	Oct. 3, 2000	Ex. 1115

“Supplement to IEEE Standard for Information technology — Telecommunications and information exchange between systems — Local and metropolitan area networks — Specific requirements — Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications: Higher-Speed Physical Layer Extension in the 2.4 GHz Band” (IEEE1999) (“IEEE 802.11b”) (Exs. 1006, 1106)

“Supplement to IEEE Standard for Information technology — Telecommunications and information exchange between systems — Local and metropolitan area networks — Specific requirements — Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications: High-speed Physical Layer in the 5 GHZ Band” (IEEE 1999) (“IEEE 802.11a”) (Exs. 1007, 1107)

Jean-Lien C. Wu et al., “An Adaptive Multirate IEEE 802.11 Wireless LAN” (IEEE 2001) (“Wu”) (Ex. 1108)

Rahman Jamal et al., “Filters” (CRC Press 2000) (“Jamal”) (Exs. 1014, 1114)

We instituted trial based on the following grounds.

References	Basis	Claim(s) Challenged
Wu and Böhnke	§ 103(a)	1
Wu, Böhnke, IEEE 802.11a, and IEEE 802.11b	§ 103(a)	2–6 and 9–22
Wu, Böhnke, IEEE 802.11a, IEEE 802.11b, and Jamal	§ 103(a)	7 and 8
Wu, Böhnke, IEEE 802.11a, IEEE 802.11b, and Agee	§ 103(a)	23

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