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Paper 60
Entered: March 6, 2015

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BROADCOM CORPORATION,
Petitioner,

v.

WI-FI ONE, LLC,
Patent Owner.

Case IPR2013-00636
Patent 6,424,625 B1

Before KARL D. EASTHOM, KALYAN K. DESHPANDE, and MATTHEW R. CLEMENTS, *Administrative Patent Judges*.

CLEMENTS, *Administrative Patent Judge*.

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

I. INTRODUCTION

Broadcom Corporation ("Petitioner") filed a Petition requesting *inter partes* review of claim 1 of U.S. Patent No. 6,424,625 (Ex. 1001, "the '625 patent"). Paper 3 ("Pet."). Telefonaktiebolaget L. M. Ericsson[1] ("Patent Owner") filed an election to waive its Preliminary Response. Paper 19. On March 10, 2014, we instituted an *inter partes* review of claim 1on certain grounds of unpatentability alleged in the Petition. Paper 25 ("Dec. to Inst.").

After institution of trial, Patent Owner filed a Patent Owner Response (Paper 34, "PO Resp.") and a Motion to Amend (Paper 36, "Mot. to Amend"). Petitioner filed a Reply (Paper 45, "Pet. Reply") and an Opposition to Patent Owner's Motion to Amend (Paper 44, "Opp. to Mot. to Amend"). Patent Owner filed a Reply to Petitioner's Opposition to its Motion to Amend. Paper 47 ("PO Reply"). Oral hearing was held on December 8, 2014.[2]

The Board has jurisdiction under 35 U.S.C. § 6(c). This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73.

Petitioner has shown, by a preponderance of the evidence, that claim 1 of the '625 patent is unpatentable. Petitoner's Motion to Amend is *denied*.

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[1] On July 11, 2014, Patent Owner filed an Updated Mandatory Notice indicating that the '215 patent had been assigned to Wi-Fi One, LLC, and that Wi-Fi One, LLC and PanOptis Patent Management, LLC were now the real parties-in-interest. Paper 38.

[2] A transcript of the oral hearing is included in the record as Paper 59.

A. Related Proceedings

Petitioner and Patent Owner indicate that the '625 patent is involved in a case captioned *Ericsson Inc. v. D-LINK Corp.*, Civil Action No. 6:10-cv-473 (E.D. Tex.) ("D-Link Lawsuit"). Pet. 1–2; Paper 6, 1. Patent Owner also identifies an appeal at the Federal Circuit captioned *Ericsson Inc. v. D-LINK Corp.*, Case Nos. 2013-1625, -1631, -1632, and -1633. Paper 6, 1. Petitioner also filed two petitions for *inter partes* review of related patents: IPR2013-00601 (U.S. Patent No. 6,772,215) and IPR2013-00602 (U.S. Patent No. 6,466,568). Pet. 2.

B. The '625 patent

The '625 patent relates generally to Automatic Repeat Request (ARQ) techniques for transferring data in fixed/wireless data networks. Ex. 1001, 1:7–9. ARQ techniques commonly are used in data networks to ensure reliable data transfer and to protect data sequence integrity. *Id.* at 1:13–15. The integrity of data sequences normally is protected by sequentially numbering packets and applying certain transmission rules. *Id.* at 1:20–22. By doing so, the receiver receiving the packets can detect lost packets and thereby request that the transmitter retransmit the affected data packets. *Id.* at 1:15–20. According to the '625 patent, there were three main ARQ schemes: Stop-and-Wait; Go-Back-N; and Selective Reject. *Id.* at 1:23–25. All three provide a mechanism for transferring packets to a receiver in a data network in an appropriate order. *Id.* at 1:25–27.

Normally, it is desirable to transfer all packets without data loss. *Id.* at 3:46–47. Sometimes, however, sending significantly

delayed packets provides no benefit—e.g., where the delay causes the information in the packets to become outdated and therefore useless to the receiver. *Id.* at 3:47–51. Examples of delay-sensitive applications are, e.g., telephony, video conferencing, and delay-sensitive control systems. *Id.* at 3:51–53. According to the '625 patent, prior art ARQ methods did not recognize and allow for situations where data packets have a limited lifetime, and therefore, fail to minimize bandwidth usage by not sending (or resending) significantly delayed or outdated data packets. *Id.* at 4:9–13.

To address these issues, the '625 patent discloses an ARQ technique that minimizes bandwidth usage by accounting for data packets that have an arbitrary but limited lifetime. *Id.* at 4:16–19. Exemplary embodiments of the invention include enhanced "Go-Back-N" and "Selective Reject" techniques that discard outdated data packets. *Id.* at 4:21–25. In an exemplary embodiment of the invention, the progress of a bottom part of a sender window of the transmitter is reported to the receiver in order to allow the receiver to properly skip packets which do not exist anymore because they have been discarded. *Id.* at 5:15–21. Thus, the receiver can be commanded to skip or overlook the packets that have been discarded or, in other words, to release any expectation of receiving the packets that have been discarded. *Id.* at 5:22–27. In the case where the transmitter discards a packet, it orders the receiver to accept the next packet by setting a Receiver Packet Enforcement Bit ("RPEB") in the ARQ header of the next packet and sending the packet to the receiver. *Id.* at

5:28–32. When the receiver receives the packet, the RPEB will cause the receiver to accept the packet. *Id.* at 5:32–33.

Figure 8 is reproduced below.

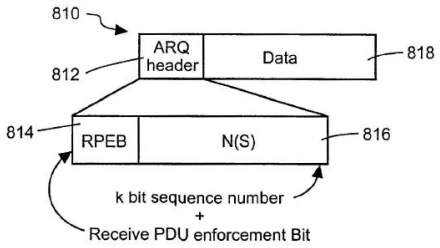

FIG. 8

Figure 8 shows ARQ packet 810 with ARQ header 812 and data portion 818. *Id.* at 5:33–35. Header 812 includes RPEB 814 and k-bit sequence number N(S) 816. *Id.* at 5:35–37. RPEB 814 may be used in a variety of situations. *Id.* at 5:41–43. For example, if a NACK is sent by a receiver, received by the transmitter, and is valid for one discarded data packet, then the next data packet to be retransmitted can have RPEB set to TRUE. *Id.* at 5:43–48. In another example, if a retransmission timer expires and one or more data packets have been discarded, the next incoming data packet to be transmitted (or the first data packet to be retransmitted) can have RPEB set to TRUE. *Id.* at 5:49–53. If RPEB is TRUE and the difference between the sequence number and the Expected Sequence Number (ESN) of the next packet to be received is less than the window size (i.e., half the maximum sequence number), the packet will be accepted and forwarded to a higher layer (as long as the data in the packet is also correct). *Id.* at 5:62–63, 6:32–36. In this way, the various embodiments of the invention increase throughput of a communications system using ARQ packets by discarding outdated packets. *Id.* at 9:60–62.

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