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Paper 40
Entered: October 26, 2017

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC., DISH NETWORK, LLC,
COMCAST CABLE COMMUNICATIONS, LLC,
COX COMMUNICATIONS, INC.,
TIME WARNER CABLE ENTERPRISES LLC,
VERIZON SERVICES CORP., and ARRIS GROUP, INC.,
Petitioner,

v.

TQ DELTA, LLC,
Patent Owner.

Case IPR2016-01006[1]
Patent 7,835,430 B2

Before SALLY C. MEDLEY, TREVOR M. JEFFERSON, and MATTHEW R. CLEMENTS, *Administrative Patent Judges.*

MEDLEY, *Administrative Patent Judge*.

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

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[1] DISH Network, L.L.C., who filed a Petition in IPR2017-00251, and Comcast Cable Communications, L.L.C., Cox Communications, Inc., Time Warner Cable Enterprises L.L.C., Verizon Services Corp., and ARRIS Group, Inc., who filed a Petition in IPR2017-00420, have been joined in this proceeding.

I. INTRODUCTION

In this *inter partes* review, instituted pursuant to 35 U.S.C. § 314, Cisco Systems, Inc. ("Petitioner") challenges claims 1–6 ("the challenged claims") of U.S. Patent No. 7,835,430 B2 (Ex. 1001, "the '430 patent"), owned by TQ Delta, LLC ("Patent Owner"). We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons discussed below, Petitioner has shown by a preponderance of the evidence that the challenged claims are unpatentable. Patent Owner's Motion to Exclude is *dismissed*.

A. Procedural History

Petitioner filed a Petition for *inter partes* review of claims 1–6 of the '430 patent. Paper 2 ("Pet."). Patent Owner filed a Preliminary Response. Paper 6 ("Prelim. Resp."). On November 4, 2016, we instituted an *inter partes* review of claims 1–6 of the '430 patent on the ground that claims 1–6 would have been obvious under 35 U.S.C. § 103(a)[2] over Milbrandt,[3] Chang,[4] Hwang,[5] and ANSI T1.413.[6] Paper 7 ("Dec.").

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[2] The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) ("AIA"), amended 35 U.S.C. §§ 102 and 103. Because the '430 patent has an effective filing date before the effective date of the applicable AIA amendments, we refer to the pre-AIA versions of 35 U.S.C. §§ 102 and 103.

[3] U.S. Patent No. 6,636,603 B1; issued Oct. 21, 2003 (Ex. 1011) ("Milbrandt").

[4] U.S. Patent No. 6,891,803 B1; issued May 10, 2005 (Ex. 1012) ("Chang").

[5] U.S. Patent No. 6,590,893 B1; issued July 8, 2003 (Ex. 1013) ("Hwang").

[6] "Network and Customer Installation Interfaces – Asymmetric Digital Subscriber Line (ADSL) Metallic Interface," American National Standards Institution (ANSI) T1.413-1995 Standard (Ex. 1014) ("ANSI T1.413").

Thereafter, Patent Owner filed a Patent Owner Response ("PO Resp."). Paper 14.[7] Petitioner filed a Reply to the Patent Owner Response ("Pet. Reply"). Paper 17. Pursuant to an Order (Paper 21), Patent Owner filed a listing of alleged statements and evidence in connection with Petitioner's Reply that Patent Owner considered to be beyond the proper scope of a reply. Paper 22. Petitioner filed a response to Patent Owner's listing. Paper 26.

Patent Owner filed a Motion to Exclude, Paper 30 ("PO Mot. Exc."), Petitioner filed an Opposition, Paper 34 ("Pet. Opp. Mot. Exc."), and Patent Owner filed a Reply, Paper 37. Patent Owner filed a Motion for Observation, Paper 32 ("PO Mot. Obs.") and Petitioner filed a Response to the Motion for Observation, Paper 35 ("Pet. Resp.").

A consolidated oral hearing for this case and related Cases IPR2016-01007, IPR2016-01008, and IPR2016-01009, was held on August 3, 2017. A transcript of the hearing has been entered into the record. Paper 39 ("Tr.").

B. Related Proceedings

Petitioner indicates that the '430 patent is the subject of several pending judicial matters. Pet. 1–2. In addition, a different Petitioner filed a petition for *inter partes* review of the '430 patent, but we did not institute trial. *See Arris Group, Inc. v. TQ Delta, LLC*, Case IPR2016-00428 (PTAB June 22, 2016) (Paper 8).

[7] Although the title page of the brief is styled "Patent Owner's Response Under 37 CFR § 42.120," the header of each subsequent page is styled "Patent Owner's Preliminary Response." We understand the subsequent header to contain a typographical error.

C. The '430 Patent (Ex. 1001)

The '430 patent discloses systems and methods for reliably exchanging diagnostic and test information between transceivers over a digital subscriber line in the presence of disturbances. Ex. 1001, 1:44–47. The systems and methods include the use of a diagnostic link mode in the communication of diagnostic information from a remote terminal (RT) transceiver or modem to the central office (CO) transceiver or modem, where either modem transmits a message to the other modem to enter diagnostic link mode. *Id.* at 2:44–48, 3:19–29. Each modem includes a transmitter section for transmitting data and a receiver section for receiving data, and is of the discrete multitone (DMT) type (the modem transmits data over a multiplicity of subchannels of limited bandwidth). *Id.* at 1:58–62. In diagnostic mode, the RT modem sends diagnostic and test information as bits that are modulated to the CO modem. *Id.* at 3:32–34. One described modulation technique includes Differential Phase Shift Keying (DPSK) on a subset or all the carriers, as specified in ITU standard G.994.1, higher order Quadrature Amplitude Modulation (QAM) (>1 bit per carrier). *Id.* at 3:38–41.

Figure 1 illustrates the additional modem components associated with the diagnostic link mode, and is reproduced below:

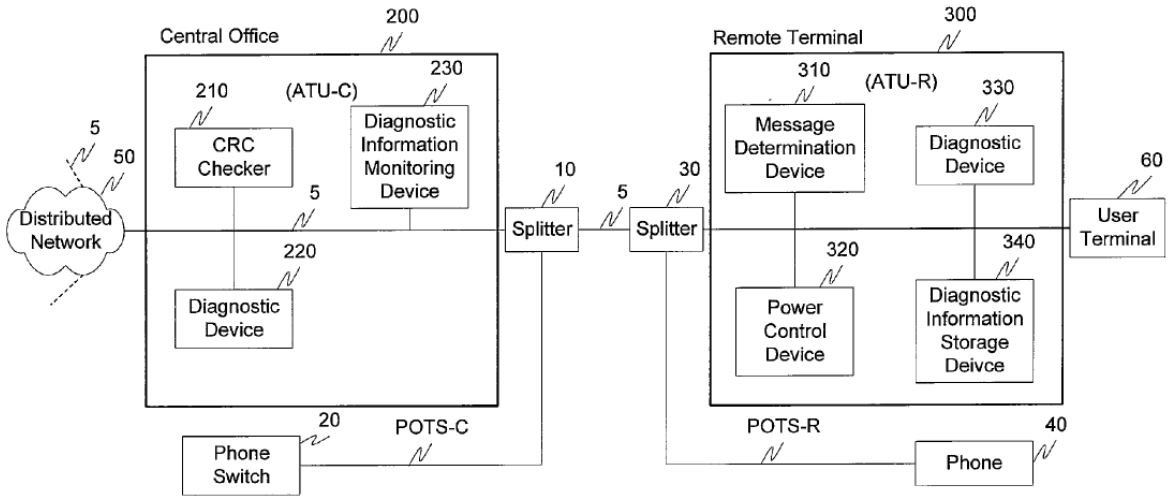

Fig. 1

Figure 1 illustrates a diagnostic mode system, where CO modem 200 and RT modem 300 are connected via link 5 to splitter 10 for a phone switch 20, and a splitter for a phone 40. *Id.* at 4:48–62. CO modem 200 includes CRC checker 210, diagnostic device 220, and diagnostic information monitoring device 230. *Id.* RT modem includes message determination device 310, power control device 320, diagnostic device 330, and diagnostic information storage device 340. *Id.*

D. Illustrative Claim

Claims 1–6 are independent claims. Claim 1 is reproduced below.

> 1. A transceiver capable of transmitting test information over a communication channel using multicarrier modulation comprising:
>
> a transmitter portion capable of transmitting a message, wherein the message comprises one or more data variables that represent the test information, wherein bits in the message are modulated onto DMT symbols using Quadrature Amplitude Modulation (QAM) with more than 1 bit per subchannel and wherein at least one data variable of the one or more data

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