

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LG ELECTRONICS, INC.,
Petitioner,

v.

CELLULAR COMMUNICATIONS EQUIPMENT LLC,
Patent Owner.

Case IPR2016-00178
Patent 8,385,966 B2

Before JENNIFER S. BISK, GREGG I. ANDERSON, and
WILLIAM M. FINK, *Administrative Patent Judges*.

ANDERSON, *Administrative Patent Judge*.

DECISION
Institution of *Inter Partes* Review
37 C.F.R. § 42.108

I. INTRODUCTION

LG Electronics, Inc. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) pursuant to 35 U.S.C. §§ 311–19 to institute an *inter partes* review of claims 1–17 of U.S. Patent No. 8,385,966 B2 (“the ’966 patent”), filed

May 5, 2009.¹ The Petition is supported by the Declaration of Dr. Robert Akl (“Akl Declaration,” Ex. 1002). Cellular Communications Equipment LLC (“Patent Owner”) filed a Preliminary Response (“Prelim. Resp.,” Paper 8). We have jurisdiction under 35 U.S.C. § 314(a), which requires demonstration of a reasonable likelihood that Petitioner would prevail with respect to at least one challenged claim, we institute an *inter partes* review of claims 1–17. Trial is not instituted on any other ground of unpatentability. The Board has not made a final determination of the patentability of any claim.

A. Related Proceedings

Petitioner advises that Patent Owner has asserted the ’966 patent in *Cellular Communications Equipment LLC v. LG Electronics, Inc. et al.*, Civil Action Nos. 6:15-cv-00049, 6:14-cv-00982, and 6:14-cv-00983 (E.D. Texas). Pet. 1, Paper 7, 2–3. Another petition challenging this patent was previously filed in *Kyocera Communications, Inc. v. Cellular Communications Equipment LLC*, No. IPR2015-01559 (PTAB) (“’1559 IPR”).²

B. Technology Background and the ’966 Patent (Ex. 1001)

The ’966 patent discloses improvements to power control for a physical uplink shared channel (PUSCH) and physical uplink control channel (PUCCH). Prelim. Resp. 2. It incorporates by reference and quotes portions of TS 36.213 (Ex. 1004), which is a specification related to Long

¹ On the present record, we cannot determine whether or not the ’966 patent is entitled to the May 5, 2008, filing date of a provisional application. Ex. 1001 (60). Petitioner alleges all the references are prior art. Pet. 13–15. Patent Owner does not contest presently that the references are prior art.

² The ’1559 IPR was terminated January 7, 2016. See ’1559 IPR, Paper 13.

Term Evolution (LTE), one of the competing standards for 4th generation (4G) cellular radio systems. Ex. 1002 ¶¶ 25, 27–28.

In LTE, the user equipment (UE) can request a connection setup with an evolved Node B (eNB). Ex. 1002 ¶ 33 (citing 4G LTE / LTE-Advanced for Mobile Broadband, Ex. 1007, 14.3, 358, Fig. 14.8; see Ex. 1001, Fig. 1B). TS 36.213 specifies details of that setup, for example, that “[t]he setting of the UE Transmit power P_{PUSCH} for the physical uplink shared channel (PUSCH) transmission in subframe i is defined by $P_{\text{PUSCH}}(i) = \min\{P_{\text{MAX}}, 10\log_{10}(M_{\text{PUSCH}}(i)) + P_{\text{O_PUSCH}}(j) + \alpha \cdot \text{PL} + \Delta_{\text{TF}}(\text{TF}(i)) + f(i)\}$.” Prelim. Resp. 1 (citing Ex. 1004 § 5.1.1.1). A similar (but not identical) power control formula is specified for the physical uplink control channel (PUCCH) transmissions having transmit power $P_{\text{PUCCH}(i)}$. *Id.* (citing Ex. 1004 § 5.1.2.1).

The '966 patent also discloses technology which is from the TS 36.300 (Ex. 1008), a technical specification of the 3rd Generation Partnership Project (3GPP). Ex. 1001, 1:61–66, 4:1–4, Figs. 1B and 1C. Figures 1B and 1C of the '966 patent are from the TS 36.300 specification. Ex. 1001, 4:1–4. Figure 1B is reproduced below:

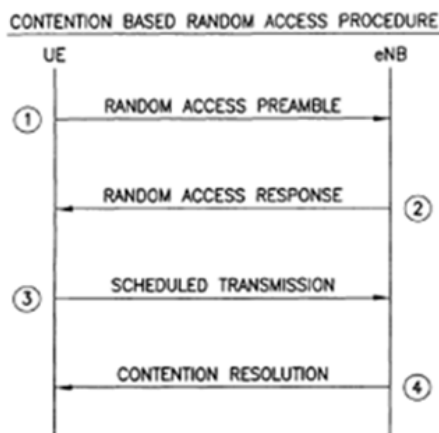


FIG. 1B
PRIOR ART

Figure 1B, reproduced above, depicts the prior art contention based random access procedure, which UEs use to request a connection setup with an eNB. Furthermore, as shown in Figure 1B, the contention based random access procedure includes four messages: a random-access preamble; a random-access response; scheduled transmission or Radio Resource Control (RRC) signaling from the terminal; and contention resolution or RRC signaling from the eNB. *See* Ex. 1001, Fig. 1B; Ex. 1002 ¶¶ 34–39 (citing Ex. 1008, 10.1.5.1, Ex. 1007, 14.3, 359).

Figure 3 of the '966 patent is reproduced below:

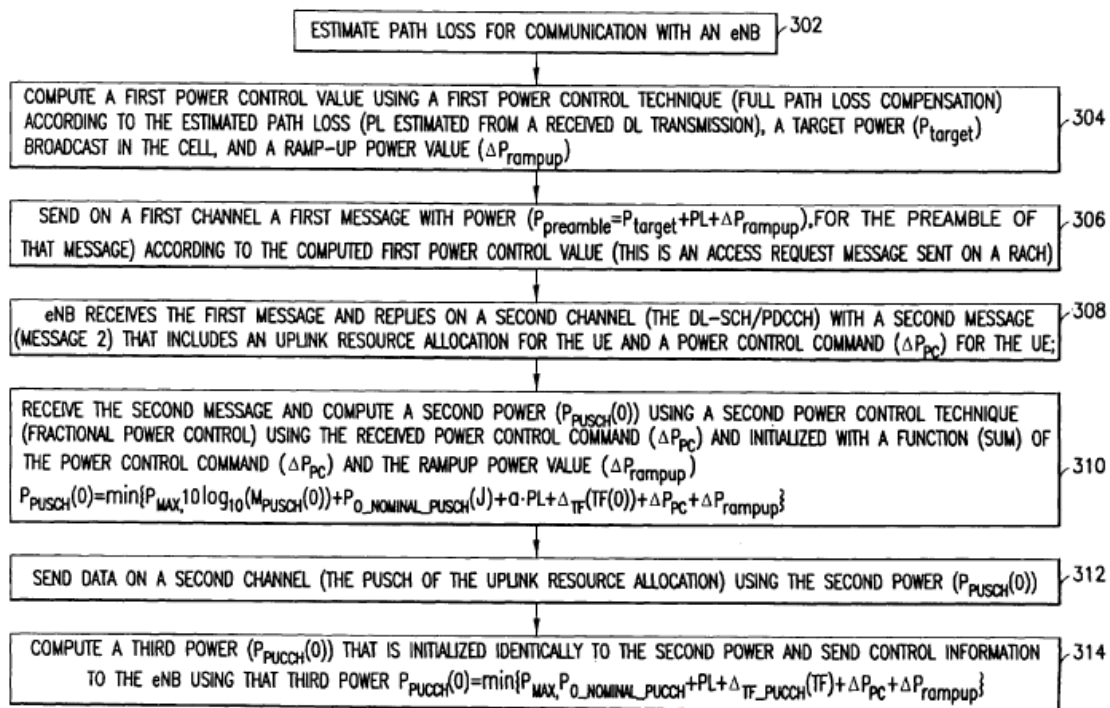


FIG.3

Figure 3 (reproduced above, best available copy) is a process flow diagram of a power control algorithm of the '966 patent. Ex. 1001, 10:28–30.

Significant steps in the algorithm are summarized as follows:

step 302, path loss for communication with eNB;
step 304, UE computes first power control value;
step 306, UE sends a first message to the eNB;
step 308, eNB replies to the UE with a second message;
step 310, the UE receives the second message and computes a
second power control value (see equation 4a below);
step 312, the UE sends data on the PUSCH using the second
power control value computed in step 310; and
step 314, a third power control value may be computed sending
control information on the PUCCH (*see* equation 4b below).

Id. at 10:31–67.

The problem the '966 patent purports to solve is “how the power control formulas for PUSCH and PUCCH are taken in use during or after the Random Access procedure.” Ex. 1001, 4:16–19. “[A]ccording to 3GPP TS 36.213 v.8.2.0 . . . Message 3 (see FIG. 1B) is transmitted using the PUSCH PC formula taking into account the PC command received from the eNB in Message 2 (see FIGS. 1B and 1C).” *Id.* at 4:20–25.

The '966 patent describes “how the UE specific parameters of the PUSCH and PUCCH power control formulas are initialized.” *Id.* at 4:26–27. The power control adjustment state for the uplink shared channel (PUSCH) is $f(i)$ and the power control adjustment state for the uplink control channel (PUCCH) is $g(i)$. *Id.* at 12:60–64. Specifically, “the UE receives a power control command (e.g., ΔP_{PC}) in the preamble response from the eNB.” Ex. 1001, 6:58–60. The $f(i)$ and $g(i)$ power control functions are initialized for $i=0$ as follows:

$$P_{O_UE_PUSCH} + f(0) = \Delta P_{PC} + \Delta P_{rampup} \quad [4a]$$

$$P_{O_UE_PUCCH} + g(0) = \Delta P_{PC} + \Delta P_{rampup} \quad [4b]$$

Ex. 1001, 6:60–67, claims 1, 3. Equation 4a appears in claim 1 as reproduced below.

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