

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,
Petitioner,

v.

INTELLECTUAL VENTURES II LLC,
Patent Owner.

IPR2025-00221
U.S. Patent No. 11,664,889

**PETITION FOR *INTER PARTES* REVIEW
UNDER 35 U.S.C. § 312 AND 37 C.F.R. § 42.104**

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PETITIONER’S EXHIBIT LIST

Ex.1001	U.S. Pat. No. 11,664,889 to Howard (“the ’889 patent”)
Ex.1002	Prosecution History of U.S. Pat. No. 11,664,889 (U.S. Application No. 17/870,425)
Ex.1003	Declaration of Dr. Michael Kotzin under 37 C.F.R. § 1.68
Ex.1004	<i>Curriculum Vitae</i> of Dr. Michael Kotzin
Ex.1005	U.S. Pat. No. 8,072,916 to Dateki
Ex.1006	Prosecution History of U.S. Pat. No. 8,811,356 (U.S. Application No. 13/176,298)
Ex.1007	3GPP Standard, TS 25.302, v.6.3.0
Ex.1008	Prabhakar Chitrapu, et al., “Wideband TDD: WCDMA for the Unpaired Spectrum,” (2004)
Ex.1009	U.S. Pat. Pub. No. 2002/0141331 to Mate et al. (“Mate”)
Ex.1010	Declaration of Sylvia Hall-Ellis, Ph.D.
Ex.1011	Andrew S. Tanenbaum, “Computer Networks,” 4th ed. (2002)
Ex.1012	United States Copyright Office Catalog Record for Andrew S. Tanenbaum, Computer Networks, 4th ed. (Ex.1012)
Ex.1013	Behrouz A. Forouzan, “Data Communications and Networking,” (3 rd ed. 2003)
Ex.1014	Copyright registration record for Forouzan (Ex.1013)
Ex.1015	IV’s Preliminary Infringement Contentions Cover Pleading, <i>Intellectual Ventures II, LLC v. Tesla, Inc.</i> , No. 6:24-cv-188-ADA (WDTX)
Ex.1016	<i>Reserved</i>
Ex.1017	IV’s Complaint, <i>Intellectual Ventures II, LLC v. Tesla, Inc.</i> , No.

	6:24-cv-188-ADA (WDTX)
Ex.1018	Proposed Scheduling Order, <i>Intellectual Ventures II, LLC v. Tesla, Inc.</i> , No. 6:24-cv-188-ADA (WDTX)
Ex.1019	Statistics on District Court Timing
Ex.1020	Interim Procedure for Discretionary Denials in AIA Parallel District Court Litigation, June 21, 2022
Ex.1021	U.S. Pat. No. 7,821,913 to Malladi et al.
Ex.1022	3GPP Proposal R1-031073 (referenced in Ex.1021)
Ex.1023	3GPP Standard TS 25.899 v. 6.0.0
Ex.1024	<i>Reserved</i>
Ex.1025	<i>Reserved</i>
Ex.1026	U.S. Pat. Pub. No. 2006/0141933 to Smee, et al.
Ex.1027	U.S. Pat. Pub. No. 2006/0025158 to LeBlanc, et al.
Ex.1028	U.S. Pat. Pub. No. 2005/0105487 to Rudolph, et al.
Ex.1029	<i>Reserved</i>
Ex.1030	<i>Reserved</i>
Ex.1031	U.S. Pat. Pub. No. 2005/0152265 to Denk
Ex.1032	U.S. Pat. Pub. No. 2005/0265279 to Markovic, et al.
Ex.1033	U.S. Pat. Pub. No. 20030219037 to Toskala et al.
Ex.1034	<i>Reserved</i>
Ex.1035	U.S. Pat. No. 7,493,133 to Krishnan et al. (“Krishnan”)

I. INTRODUCTION

U.S. Patent No. 11,664,889 (the “’889 patent,” Ex.1001) describes and claims the well-known concept of closed loop power control in a wireless network, in which a base station controls a mobile station’s transmission power. The central feature claimed by the ’889 patent is a power control command sent by the base station to multiple mobile stations to control their transmission power. This feature, however, had already been adopted in the Third Generation (3G) standard as the Fractional Dedicated Physical Channel (F-DPCH) before the priority date of the ’889 patent. The Dateki reference relied upon in this Petition describes specific implementations of this F-DPCH.

Accordingly, pursuant to 35 U.S.C. §§ 311, 314(a), and 37 C.F.R. § 42.100, Tesla, Inc. (“Petitioner”) respectfully requests that the Board review and find unpatentable claims 1-8 (hereinafter, the “Challenged Claims”) of the ’889 patent.

II. GROUNDS FOR STANDING

Petitioner certifies that the ’889 patent is eligible for IPR and that Petitioner is not barred or estopped from requesting IPR challenging the patent claims. 37 C.F.R. § 42.104(a).

III. NOTE

Petitioner cites to exhibits’ original page numbers, unless noted otherwise. **Emphasis** in quoted material has been added. Claim terms are presented in *italics*.

IV. TECHNOLOGY BACKGROUND

An understanding of the cellular communication technologies known before the earliest possible priority date of the '889 patent confirms that there was nothing new or novel about the user equipment (UE) recited in the Challenged Claims.¹

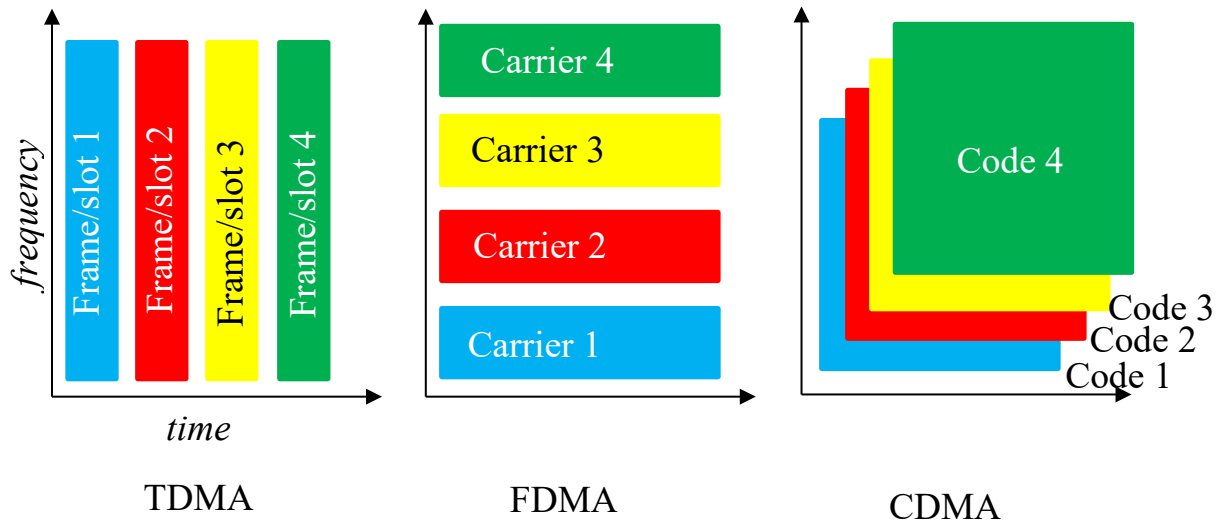
A. Multiple Access Protocol for Enhanced Cellular Communication: Code Division Multiple Access (CDMA)

Multiple mobile devices (e.g., cell phones) typically need to communicate through the same medium (air space) to the same node (base station on a cell tower). With many devices sharing one communication medium, it is important to prevent and/or correct for interference from other mobile devices trying to communicate at the same time. A “multiple access” protocol provides a way for those mobile devices to receive and transmit data on the same medium while keeping collisions and interference to a minimum. Ex.1011, 247-251 (explaining challenges with providing multiple users access to a common link, and summarizing different types of multiple access solutions); Ex.1013, 311-313

¹ Many of the technologies described in this section are still in use today. Thus, although some of this discussion refers to these technologies in the present tense, all the technologies would have been well-known to a POSITA before the priority date of the '889 patent. Ex.1003, ¶34.

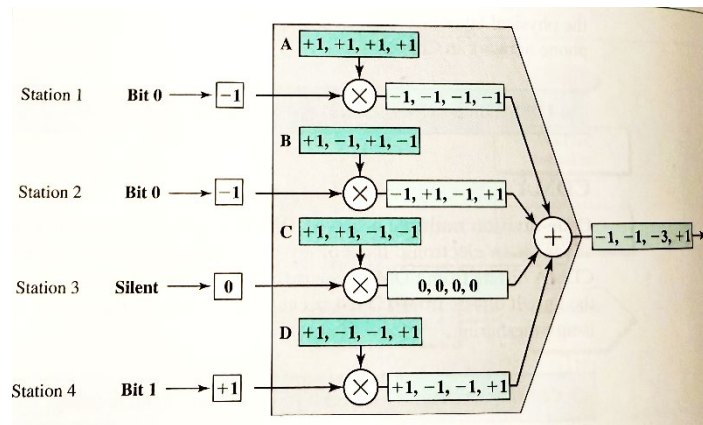
(same); Ex.1003, ¶30.

The multiple access protocol underlying Third Generation (3G) cellular communications is called Code Division Multiple Access (CDMA). Ex.1011, 162, 166-167; Ex.1013, 419-420. CDMA is different from other multiple access protocols which simply assign different time and/or frequency resources to different users. For instance, Time Division Multiple Access (TDMA) allocates separate time periods (e.g., time frames, slots), and Frequency Division Multiple Access (FDMA) allocates separate frequency resources (carriers). Ex.1011, 162; Ex.1013, 321. But CDMA allows multiple wireless devices to communicate in the same frequency band and at the same time by using unique codes. Ex.1011, 162-165; Ex.1013, 321-324; Ex.1003, ¶31. The figure below illustrates how TDMA, FDMA, and CDMA use time division, frequency division, or code division to allow multiple UEs (blue, red, yellow, and green) to communicate with a base station on a cell tower.

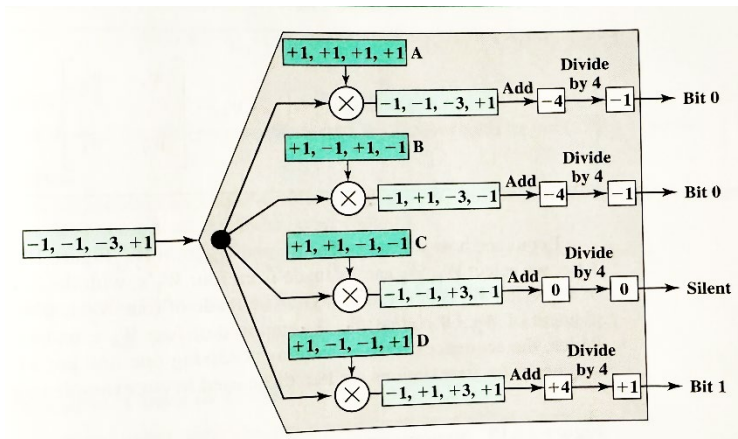


Ex.1003, ¶31

In CDMA, each user's signal is encoded with a unique spreading code, which includes a series of code bits or "chips." This code spreads the signal across a wide bandwidth. The receiver (base station on the cell tower) uses the same code to decode the signals and associate the decoded signals with each corresponding user. Ex.1011, 162-163; Ex.1013, 321-323 (explaining that both the transmitting device and receiving device use code sequence to transmit and receive data on CDMA channels). Example CDMA encoding (multiplexing) and decoding (demultiplexing) processes for information bits from four mobile stations (Stations 1-4) are illustrated below. Ex.1003, ¶32.



CDMA multiplexing



CDMA demultiplexing

Ex.1013, FIGS. 13.16, 13.17; Ex.1003, ¶32.

This CDMA coding scheme is what allows multiple devices to communicate with the network concurrently without interfering with one another. Because each user's signal is spread over the same frequency spectrum and across time, CDMA increases spectrum efficiency, making it particularly useful in environments with many simultaneous users, such as mobile networks. Ex.1011, 165-167 (explaining advantages of CDMA and its eventual adoption into 3G networks). Its interference

mitigation and capacity for handling multiple signals efficiently made CDMA a desirable choice for 3G cellular providers attempting to deliver more advanced services in rapidly growing networks. *See* Ex.1003, ¶33.

B. Third Generation (3G) Cellular: Universal Mobile Telecommunications System (UMTS) and UMTS Terrestrial Radio Access Network (UTRAN)

CDMA is the multiple access technology on which 3G cellular communication technologies are built. Two competing 3G systems were deployed by different providers in the United States: the Universal Mobile Telecommunications System (UMTS), and CDMA2000. Ex.1011, 167; Ex.1008, 3-4. Both systems are based on CDMA. Ex.1003, ¶34.

UMTS, which became the more widely deployed 3G technology compared to CDMA2000, provides high-speed voice, data, and multimedia services. Ex.1011, 167-168. The UMTS Terrestrial Radio Access Network (UTRAN) is the radio access network component of UMTS. Ex.1008, 5. UTRAN is responsible for connecting mobile devices to the core network, managing communications between mobile devices (cell phones) and the UMTS core network, and handling both the radio transmissions and resource allocation. Ex.1008, 5, 6; Ex.1003, ¶35.

UMTS allows for two CDMA duplexing methods. The first, Wideband CDMA (W-CDMA), uses separate frequency bands for uplink and downlink (Frequency Division Duplex) and is used for voice and balanced data services. W-

CDMA is the dominant UMTS standard globally. The second duplexing method was Time Division CDMA (TD-CDMA), which uses the same frequency band for both uplink and downlink (Time Division Duplex), but the uplink and downlink signals are transmitted in different time slots. TD-CDMA had more specific use cases and was not as widely adopted as the W-CDMA version of UMTS. Although not identical, W-CDMA and TD-CDMA share many underlying CDMA-based mechanisms, including power control and random access methods for initial access. *See, e.g.*, '889 patent, 4:4-12 (referring to several 3GPP standards for UMTS); Ex.1003, ¶36.

Several enhancements to W-CDMA were developed over the years, including High-Speed Downlink Packet Access (HSDPA), and Wideband Time Domain Duplexing (TDD) W-CDMA. Ex.1008, 3-4; Ex.1023, 1, 6, Ex.1003, ¶37.

C. Transmission Power Control

In 3G cellular networks, power control is important for managing interference and ensuring efficient use of the shared spectrum in CDMA systems. The goal of power control is that each device transmits at a power level high enough to maintain a strong connection, but not too high that it interferes with other users. Ex.1003, ¶38.

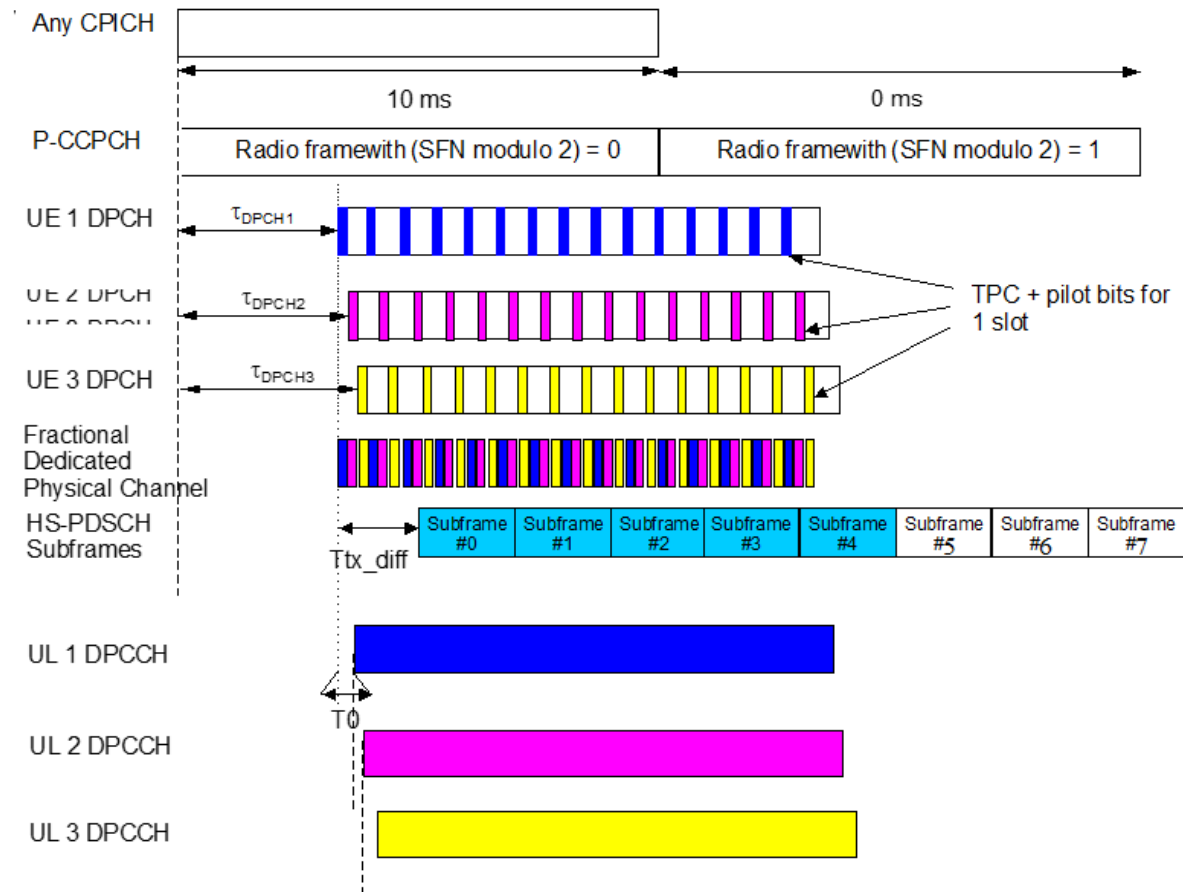
CDMA systems like UMTS rely on a Transmission Power Control (TPC) mechanism. Ex.1008, 114-118. Power control is used to adjust and regulate the

transmission power of both the network device (base station on a cell tower), and the user equipment (UE), which may be a cell phone. For transmission power from the mobile device to the network device (referred to as “uplink”), the base station continuously monitors signals transmitted by the mobile device and assesses quality. Ex.1008, 117-118. Based on this evaluation, the base station sends TPC commands that instruct the mobile device to either increase or decrease its transmission power by discrete, incremental amounts. Ex.1008, 117, Figure 5.20. This is referred to as “closed loop” power control; Ex.1003, ¶39.

This closed loop feedback mechanism provided real-time transmission power optimization to increase the reliability of communications, reduce interference, and reduce unnecessary power consumption. *See* Ex.1003, ¶40.

One improvement to W-CDMA that came with High-Speed Downlink Packet Access (HSDPA) was the introduction of a new dedicated channel for power control that would be shared by multiple UEs. This channel was called the Fractional Dedicated Physical Channel (F-DPCH). Ex.1021, 4:9-11; Ex.1005, 4:15-22, 5:4-7. F-DPCH allowed TPC commands for multiple UEs to be transmitted in a single downlink channel, reducing the overhead associated with the traditional dedicated control channels in W-CDMA. Ex.1021, 4:9-11; Ex.1005, 4:15-22, 5:4-7; Ex.1003, ¶41. The figure below from one of the initial proposals for F-DPCH illustrates how TPC control bits for three different UEs (illustrated by

blue, magenta, and yellow boxes) are combined and time-multiplexed within the same slots.



Ex.1022, 2; Ex.1003, ¶41.

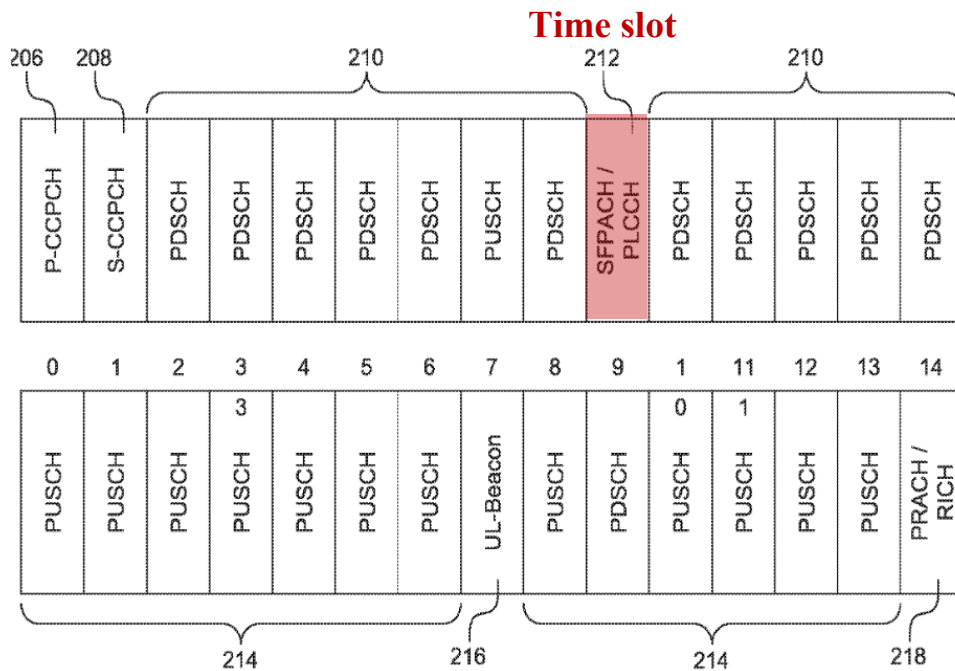
This Fractional Dedicated Physical Channel (F-DPCH) was proposed in October 2003 and was first adopted by 3GPP in June 2004 before the earliest possible priority date of the '889 patent. Ex.1022, 1, 2 (proposing F-DPCH); Ex.1023, 1, 6 (release date and purpose of TS 25.899 standard), 47-48 (describing F-DPCH). Ex.1003, ¶42.

V. THE '889 PATENT

The '889 patent relates to “closed loop” power control in a mobile terminal in the context of UMTS and CDMA communication protocols. Ex.1001, 2:44-46, 2:62-64, 4:4-12; 5:9-14. Using closed loop power control, a “base station detects the received power and/or other channel information from [an uplink signal], and sends controlling commands back to each terminal,” such as power control commands. Ex.1001, 5:9-14. Power control commands allow a mobile terminal (also known as a User Equipment or UE) to “transmit at the correct power” by indicating “whether terminal power should be increased or decreased.” Ex.1001, 4:67-5:1, 5:19-21. Ex.1003, ¶43.

The '889 patent explains that the base station transmits power control information for multiple UEs on a single downlink channel, and each UE “extract[s] the relevant feedback field.” Ex.1001, 5:15-29. The '889 patent refers to this single downlink channel as a “Physical Layer Control Channel (PLCCH).” Ex.1001, 5:22-23. Thus, power control commands for multiple terminals may be transmitted on a shared downlink control channel. Ex.1003, ¶44.

Further, the '889 patent explains that the control channel carrying the power control information “can share a timeslot with other physical channels.” Ex.1001, 2:61-64. FIG. 2 illustrates a control channel (PLCCH) sharing a downlink (DL) timeslot (ref. 212) with another channel (SFPACH). Ex.1003, ¶45.



Ex.1001, FIG. 2; Ex.1003, ¶45.

The independent claims of the '889 patent are directed to a power control mechanism where power control information for multiple UEs are transmitted in a same control message. Ex.1003, ¶49. The independent claims can be summarized with three parts:

1. A first UE receives “a control message over a physical control channel in a first time slot,” where the “control message has **power control bits for a plurality of UEs**” (limitations [1.2], [1.4]);
2. The “first time slot” during which the control message is received also includes a “downlink shared channel” (limitation [1.3]); and
3. The first UE “extract[s] power control information for the first UE”

and “*transmit[s] a signal over a physical control channel to a base station in a second time slot at a transmission power level based on the extracted power control information.*” (limitations [1.5] and [1.6]).

The prior art cited in this Petition confirms the unpatentability of claim 1 and the other Challenged Claims.

VI. PROSECUTION HISTORY

A. Prosecution history of the ’889 patent

The ’889 patent was filed as U.S. Application No. 17/870,425 (“’425 application”). The ’889 patent claims priority through a series of continuation applications to the application that issued as U.S. Patent 8,009,639, which was filed on December 27, 2006 (the earliest filing date of an ancestral application). Ex.1002, 41-42.

The prosecution of the ’889 patent was brief. Filed with a Track One request, the ’425 application was allowed just 6 months after it was filed. Ex.1002, 137.

Only one Office Action issued during prosecution, rejecting independent claim 1 and indicating several dependent claims, including dependent claim 2, recited allowable subject matter. Ex.1002, 58-60. The Applicant subsequently amended the independent claims to incorporate dependent claim 2, and the application was allowed. Ex.1002, 125-134, 137, 141.

The language incorporated into the independent claims from dependent claim 2 recites “*wherein the first time slot also includes a downlink shared channel,*” which is limitation [1.3] below. Ex.1002, 126.

VII. PRIORITY DATE OF THE '889 PATENT

The earliest possible priority date of the '889 patent is October 13, 2006. During prosecution of parent Application 13/176,298 (now U.S. Patent 8,811,356), the Applicant filed a Declaration to swear behind a reference dated November 29, 2006. Ex.1006, 612, 618-620. The Declaration refers to an October 13, 2006 email Applicant exchanged with outside counsel. Ex.1006, 619, 634. To the extent that email is evidence of a potential earlier invention date for the '889 patent, October 13, 2006 is too late to serve as a basis to swear behind the prior art cited in this Petition.

Determining whether the '889 patent is entitled to this date is unnecessary in this proceeding because all applied prior art predates October 13, 2006. Petitioner does not waive any right or opportunity to dispute the priority date of the '889 patent in this or another forum.

VIII. LEVEL OF ORDINARY SKILL IN THE ART

A person of ordinary skill in the art (“POSITA”) in October 2006 would have been someone knowledgeable and familiar with the wireless communications systems that are pertinent to the '889 patent. That person would have a bachelor's

degree in electrical engineering, computer engineering, computer science, or equivalent training, and approximately two years of experience working in the field of wireless communication systems or design of similar communication systems. Lack of work experience can be remedied by additional education, and vice versa. Ex.1003, ¶25.

IX. CLAIM CONSTRUCTION

Petitioner submits that all claim terms should be construed according to their plain and ordinary meaning.² Ex.1003, ¶54. Petitioner believes that, for the purposes of this proceeding and the analysis presented herein, no claim term requires express construction. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

X. RELIEF REQUESTED AND THE REASONS FOR THE REQUESTED RELIEF

Petitioner asks that the Board institute an IPR trial and cancel the Challenged Claims in view of the analysis below.

² Petitioner does not concede that any term not construed herein meets the statutory requirements of 35 U.S.C. § 112.

XI. IDENTIFICATION OF HOW THE CLAIMS ARE UNPATENTABLE

A. Challenged claims

Petitioner challenges claims 1-8.

B. Statutory grounds for challenges

Grounds	Claims	Basis (pre-AIA)
#1	1, 2, 5, 6	§ 103 under Dateki
#2	3, 7	§ 103 under Dateki in view of Mate
#3	4, 8	§ 103 under Dateki in view of Chitrapu

U.S. Patent No. 8,072,916 to Dateki (“Dateki”) (Ex.1005) filed April 26, 2005 and issued December 6, 2011 is prior art under at least pre-AIA 35 U.S.C. §§102(e) and 102(a).

U.S. Patent Pub. No. 2002/0141331 to Mate et al. (“Mate”) (Ex.1009) published October 3, 2002 is prior art under at least pre-AIA 35 U.S.C. §§102(b) and 102(a).

Dr. Prabhakar Chitrapu, Wideband TDD: WCDMA for the Unpaired Spectrum (2004) (“Chitrapu”) (Ex.1008) is prior art under at least pre-AIA 35 U.S.C. §§102(b) and 102(a).

Chitrapu is a printed publication under pre-AIA 35 U.S.C. §§102(a) and 102(b), and AIA 35 U.S.C. §311(b). Petitioner submits the Declaration of Sylvia Hall-Ellis, Ph.D. (Ex.1010) to show that Chitrapu (Ex.1008) was publicly available

well before the earliest priority date of the '889 patent. *See* §XI.E.5 below.

Petitioner's obviousness grounds rely on the combined teachings of the references and not on a physical incorporation of elements. *See In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012).

Petitioner also cites below to additional prior art as evidence of the background knowledge of a POSITA and to provide contemporaneous context to support Petitioner's assertions regarding what a POSITA would have understood from the prior art in the grounds. *See Yeda Research v. Mylan Pharm. Inc.*, 906 F.3d 1031, 1041-1042 (Fed. Cir. 2018) (affirming the use of "supporting evidence relied upon to support the challenge"); 37 C.F.R. §42.104(b); *see also K/S HIMPP v. Hear-Wear Techs., LLC*, 751 F.3d 1362, 1365-66 (Fed. Cir. 2014); *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1363 (Fed. Cir. 2016).

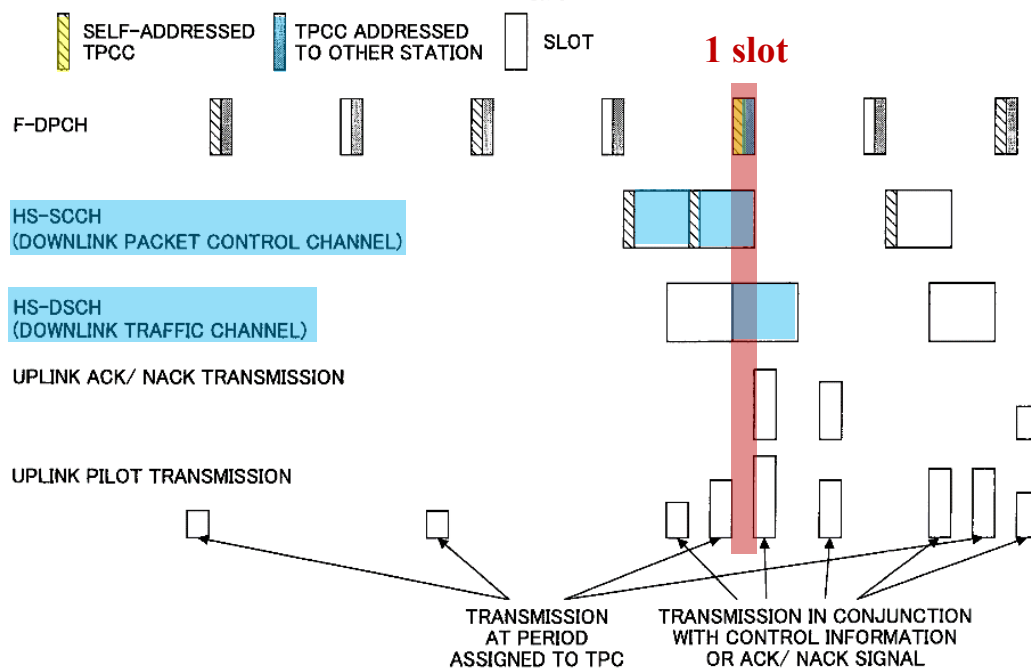
C. Ground 1: Claims 1, 2, 5, and 6 are obvious over Dateki

1. Dateki

Dateki describes specific implementations of the "fractional dedicated physical channel (F-DPCH)," discussed in the Technology Background above at §IV.C. F-DPCH was adopted into the 3GPP standard no later than March of 2005. *See* Ex.1007 (3GPP standard including F-DPCH features, uploaded to 3GPP FTP site on March 24, 2005). Ex.1003, ¶58.

F-DPCH is a channel specifically designed to transmit TPC control bits

addressed to multiple UEs using a single channelization code. The term “fractional” is similar to the ’889 patent’s description of the PLCCH being “fractionated.” *See, e.g.*, Ex.1001, 2:65-67. Dateki’s FIG. 6 and accompanying text show that a single slot of the F-DPCH carries TPC commands (“TPCC”) for at least two UEs: a first UE (“Self-Addressed”), and a second UE (“Addressed to Other Station.”)



Ex.1005, FIG. 6 (annotated); Ex.1003, ¶59.

Dateki shows that the slot carrying the F-DPCH also includes two downlink shared channels (highlighted in blue above): a High-Speed Shared Control Channel (HS-SCCH) and a High-Speed Downlink Shared Channel, (HS-DSCH). Ex.1005, FIG. 6, 12:29-32; Ex.1003, ¶¶59-60.

Dateki also explains that the UE receiving the F-DPCH extracts its power control information and inputs that power control information into a transmission power control unit:

Also, inverse diffusion outputs including transmission power control information that are obtained by inverse diffusion processes conducted by the TCH inverse diffusion unit 34 and the DCH inverse diffusion unit 35, respectively, are input to **the TPCC extracting unit 37 at which the transmission power control information is extracted**. The extracted transmission power information is then input to the transmission power control unit 38.

Ex.1005, 10:51-59; Ex.1003, ¶61.

The transmission power control unit uses this extracted power control information to set a transmission power level for uplink pilot symbols and acknowledgement/non-acknowledgement feedback signals:

Also, according to the present embodiment, uplink traffic data, **a pilot symbol, and a ACK/NACK signal** based on the reception processing result of processing downlink traffic data output are input to the diffusion units 45, 46, and 47, respectively, to be diffused by differing diffusion codes. Then the diffused signals are multiplexed at the multiplexing unit 44, and multiplied at the multiplying unit

43 by a control value from the transmission power control unit 38 to realize transmission power control.

Ex.1005, 10:60-11:11; Ex.1003, ¶62.

The portions of Dateki relied upon herein are consistent with the 3GPP standard adoptions related to F-DPCH, and the CDMA-based cellular technologies described above in the Technology Background. *See supra*, § IV; Ex.1007, 66 (3GPP standard for physical layer services including F-DPCH), 37 (table showing that F-DPCH can be transmitted simultaneously with downlink shared channels such as HS-SCCH and HS-PDSCH); Ex.1023, 47, 48 (3GPP standard for HSDPA including F-DPCH); Ex.1003, ¶63.

Dateki discloses or renders obvious each limitation of claim 1.

Analogous Art

Like the '889 patent, Dateki describes CDMA-based cellular communication protocols. *See, e.g.*, Ex.1005, 8:25-30; Ex.1001, 4:4-12. Thus, Dateki is in the same field of endeavor as the '889 patent. Further, Dateki's F-DPCH mechanisms more efficiently provide power control information to mobile stations in a way that uses fewer code resources. Ex.1005, 5:4-7. The '889 patent also aims to make more efficient use of network resources in its closed loop power control mechanisms. *See* Ex.1001, 2:52-64. Thus, Dateki is also reasonably pertinent to the same problem the '889 patent addresses. Accordingly, Dateki is analogous art to the

'889 patent. Ex.1003, ¶64.

2. Claim 1

[1.0] A first user equipment (UE) comprising:

To the extent the preamble is limiting, Dateki discloses a *user equipment*.

Ex.1003, ¶¶65-67.

Dateki discloses a “wireless communication apparatus such as a mobile station.” Ex.1005, 7:56-57. Dateki describes the “mobile station” transmitting uplink signals to a base station:

The HS-DPCCH [High Speed-Dedicated Physical Control Channel] in the mobile wireless communication system corresponds to **an uplink dedicated control channel from the mobile station to the base station**, and is used upon transmitting **from the mobile station to the base station an [acknowledgement] ACK signal** or a [non-acknowledgement] NACK signal indicating whether data received via the [High Speed-Physical Downlink Shared Channel] HS-PDSCH are properly received.

Ex.1005, 2:35-40.

Further, Dateki makes clear that the “mobile station” is synonymous to a “UE.” For instance, Dateki describes a parameter “Xue” that “corresponds to identification information of the mobile station (user).” Ex.1005, 4:1-3. Dateki also explains that Xue represents a “UE identity.” Ex.1005, 3:34-35. Accordingly,

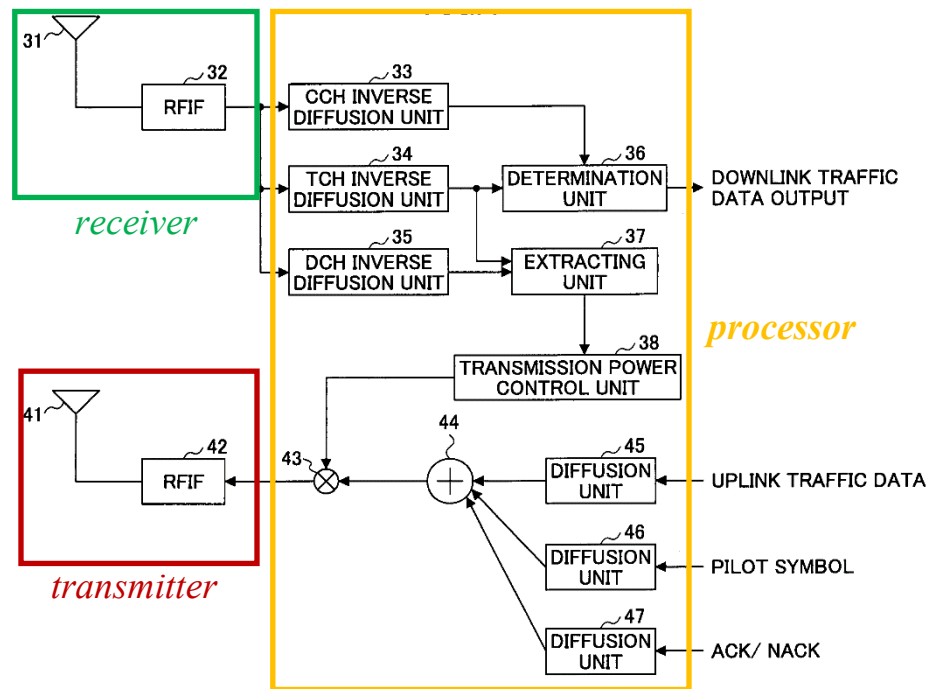
Dateki uses “mobile station” interchangeably with “user” or “UE.” Ex.1003, ¶¶65-66.

Thus, Dateki’s “mobile station” discloses *a first user equipment*. Ex.1003, ¶67.

[1.1] a transmitter; a receiver; and a processor, operatively coupled to the transmitter and the receiver,

Dateki discloses or renders obvious limitation [1.1]. Ex.1003, ¶¶68-78.

Dateki’s FIG. 4 below illustrates a “wireless communication apparatus,” which as explained above in [1.0] corresponds to the “mobile station” (*first user equipment*). See Ex.1005, 10:8-10. As shown in FIG. 4 below, Dateki discloses or at least renders obvious a *transmitter* (red) a *receiver* (green); and a *processor* (yellow). Ex.1003, ¶68.



Ex.1005, FIG. 4 (annotated); Ex.1003, ¶68.

Dateki explains that the wireless communication apparatus includes an “antenna 41 [] configured to transmit a signal from the high frequency processing unit 42....” Ex.1005, 10:29-31. The antenna 41 and the high frequency processing unit 42 (shown in FIG. 4 as “RFIF”) disclose the *transmitter*. Ex.1003, ¶68.

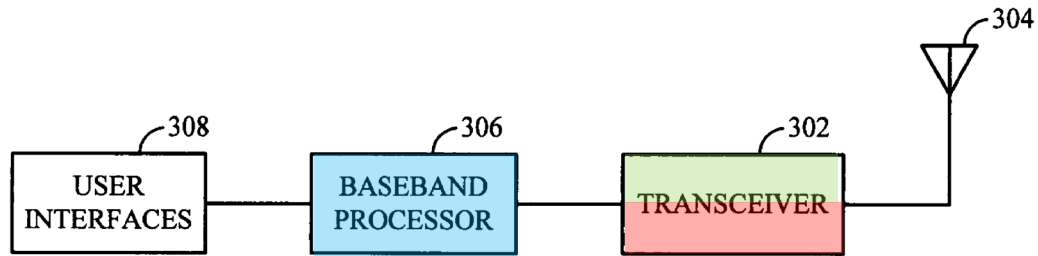
The mobile station shown in FIG. 4 above also includes an antenna 31 that “receives a signal transmitted from [the base station] and inputs the received signal to the high frequency processing unit 32. Ex.1005, 10:25-27. The antenna 31 and the high frequency processing unit 32 (“RFIF”) disclose the *receiver*. Ex.1003, ¶69.

The mobile station further includes several components coupled to the

antennas 31, 41, and the high frequency processing units 32, 42, including: “a CCH inverse diffusion unit 33, a TCH inverse diffusion unit 34, a DCH inverse diffusion unit 35, a bit determination unit 36, a TPCC extracting unit 37, a transmission power control unit 38...a multiplying unit 43, a multiplexing unit 44, and diffusion units 45, 46, and 47.” Ex.1005, 10:15-20. These components, shown within the yellow box in annotated FIG. 4 above, disclose *the processor*. Ex.1003, ¶70. These components are coupled to each of the antennas 31, 41, and the high frequency processing units 32, 42. Ex.1005, FIG. 4, 10:55-57, 11:7-18. Accordingly, Dateki discloses that *the processor is operatively coupled to the transmitter and the receiver*. Ex.1003, ¶70.

To the extent it is argued that Dateki does not explicitly disclose that the circuitry of its wireless communication apparatus in FIG. 4 comprises *a processor*, a POSITA would have found this obvious. For instance, it was known before the priority date of the '889 patent for various signal processing components and circuitry of a mobile wireless device to be implemented on *a processor*, such as an application specific integrated circuit (ASIC). *See, e.g.*, Ex.1026, [0206], [0207] (UMTS UE circuitry and hardware modules can be implemented as a digital signal processor, an ASIC, or general purpose processor); Ex.1027, [0319] (CDMA data communication by a mobile station can be performed by an “ASIC chip mobile station modem.”); Ex.1003, ¶¶72-73. Further, a POSITA would have understood

the processing circuitry of Dateki's mobile station to include a baseband *processor* like the one illustrated below by Krishnan's Fig. 3:



Ex.1035, Fig. 3 (annotated); Ex.1003, ¶73.

Ex.1035, 3:49-59, 5:39-55; Ex.1003, ¶73.

Krishnan's Fig. 5 shows a more detailed view of the baseband processor 306 connected to the receiver and transmitter (shown as Transceiver 302 in Fig. 3):

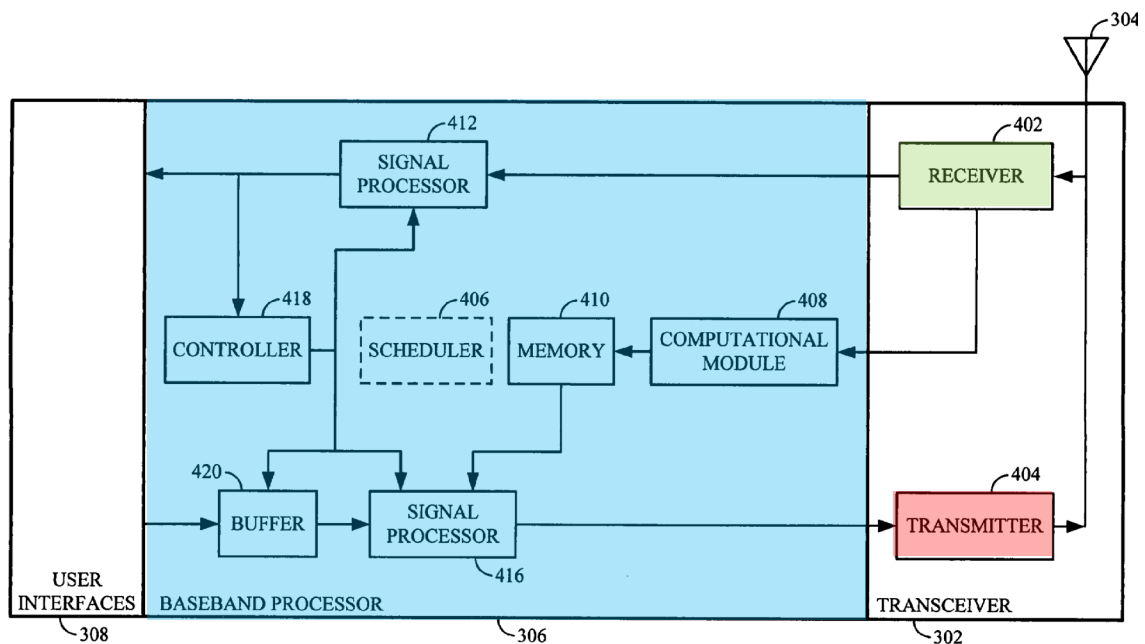


FIG. 5

Ex.1035, Fig. 5 (annotated); Ex.1003, ¶75.

Ex.1035, 6:30-7:15; Ex.1003, ¶¶74-75.

These processing components are similar to the computational and signal processing circuitry of the mobile station described in Dateki. Ex.1005, Fig. 4, 10:35-57, 11:7-18; Ex.1003, ¶76. Thus, Dateki discloses or at least renders obvious that the mobile station comprises *a processor*, such as a baseband *processor*. Ex.1003, ¶76.

Thus, Dateki discloses or at least renders obvious *a transmitter* (antenna 41 and high frequency processing unit 42); *a receiver* (antenna 31 and high frequency processing unit 32); and *a processor* (components 33, 34, 35, 36, 37, 38, 43, 44, 45, 46, and 47) *operatively coupled to the transmitter and the receiver*. Ex.1003, ¶¶76-78.

[1.2] wherein: the receiver and the processor are configured to receive a control message over a physical control channel in a first time slot,

Dateki discloses or at least renders obvious limitation [1.2]. Ex.1003, ¶¶79-85.

Dateki discloses the UE receiving control information over a “fractional dedicated **physical control channel** (F-DPCH),” which is an example of the recited *physical control channel* in [1.2]. Ex.1005, 4:35-40 (describing F-DPCH carrying TPC bits for plural users), 12:13-15 (same); Ex.1003, ¶79.

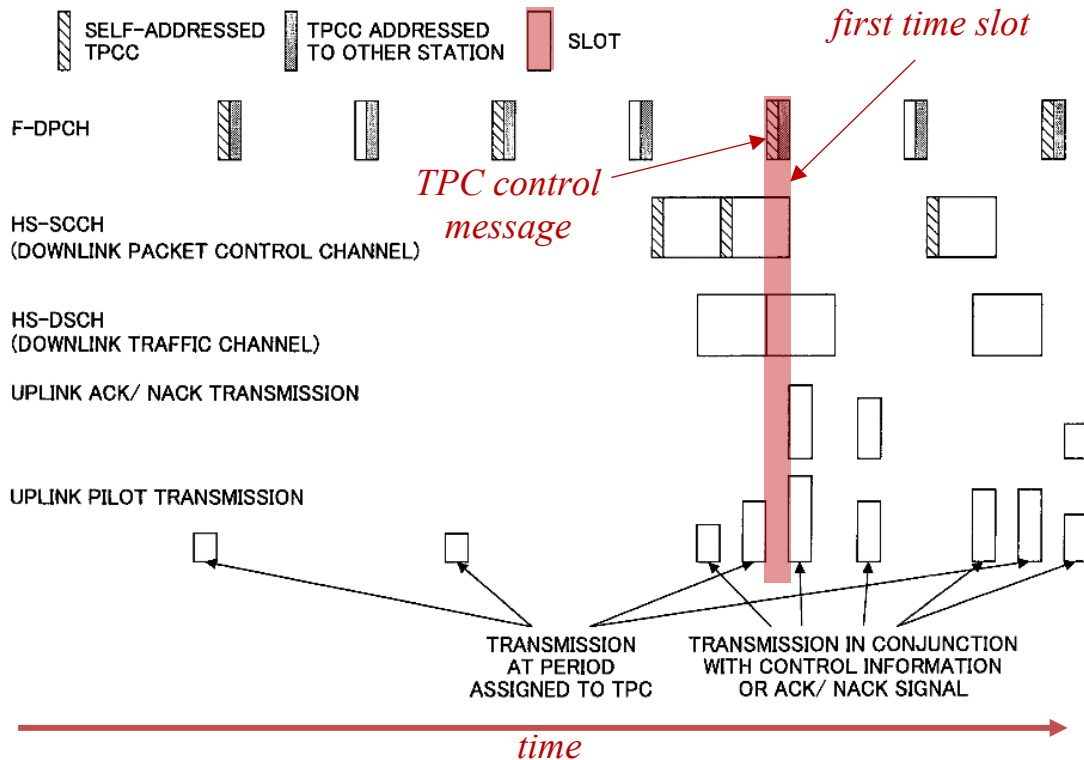
Further, Dateki discloses transmitting a power *control message* over the F-DPCH: “[t]he F-DPCH corresponds to a channel that is capable of transmitting a

slot including plural TPC [transmit power control] bits addressed to differing mobile stations.” Ex.1005, 12:13-15. The TPC commands (or bits) carried in the F-DPCH comprise a *control message*, because the TPC commands are communicated together in a control channel (F-DPCH), and the TPC commands are used to facilitate the maintenance, stability, and quality of the communication link. Ex.1003, ¶80. Dateki similarly explains that transmitting the TPC bits “is conducted through time division multiplexing **within the same slot.**” Ex.1005, 4:21-22; Ex.1003, ¶80.

Dateki uses the term “slot” throughout, and a slot is an example of time slot. *See, e.g.*, Ex.1005, 3:4-5 (“15 slots make up one frame (10 ms)...”), 4:20-22 (transmission of TPC bits to plural users in F-DPCH is “conducted through time division multiplexing in the same slot.”) For example, Dateki uses the term “slot” in the Background section in describing the frame structure of High Speed Downlink Packet Access (HSDPA). Ex.1005, 3:15-17. In reference to FIG. 2, for example, Dateki explains that in HSDPA “15 slots make up one frame (10 ms).” Ex.1005, 3:4-5. Other references describing the frame structure of HSDPA refer to the same “slots” as “time slots.” *See, e.g.*, Ex.1028, [0031] (“Under current R5 HSDPA specifications, fifteen (15) time slots include one (1) frame...”). The ’889 patent likewise uses “slot” and “time slot” interchangeably. *See, e.g.*, Ex.1001, 6:40-41, 46-48 (“For example, a single terminal may not be able to access all

transmit and all receive slots....In particular, this may also apply for the case where there are more than one UL-Beacon timeslot per, [sic] frame.”). Thus, a POSITA would understand Dateki’s “slot” to disclose a *time slot*. Ex.1003, ¶81.

As explained above, the TPC commands carried in the F-DPCH (control channel) comprise a *control message*, because the TPC commands are communicated together in a F-DPCH, and the TPC commands are used to maintain the communication link. Ex.1003, ¶81. Referring to FIG. 6 below, Dateki illustrates a plurality of time slots and associated channels and transmissions. In FIG. 6, time runs horizontally across the figure. Dateki illustrates transmitting TPC commands (*control message[s]*) in various time slots in both the F-DPCH and High Speed Physical Downlink Shared Channel (HS-PDSCH). *See* Ex.1005, 12:17-19 (describing periodicity of TPCC transmissions in numbers of slots). Ex.1003, ¶82.



Ex.1005, FIG. 6 (annotated); Ex.1003, ¶82.

The slot (in red) during which the highlighted F-DPCH communication including the TPCCs discloses *the first time slot*. Ex.1003, ¶83. Dateki’s F-DPCH communication that includes TPCC for plural users (“self-addressed,” and “to other station”), grouped and transmitted together in the slot, is an example of a *control message*. In this regard, Dateki explains that the TPC bits for the plural users are encoded “using the same code.” Ex.1005, 4:35-40; Ex.1003, ¶83. The F-DPCH (Fractional Dedicated Physical Channel) on which the encoded TPC bits are transmitted discloses a physical control channel, thereby disclosing a *control*

message over a physical control channel in a first time slot. Ex.1003, ¶83.

Further, as explained above in [1.1], Dateki discloses that the mobile station that receives the F-DPCH includes *a processor* (TPCC extracting unit 37 and a transmission power control unit 43) and *a receiver* (antenna 31 and the high frequency processing unit 32) Ex.1005, FIG. 6, 10:55-57, 11:7-18. Dateki explains that the mobile station's TPCC extracting unit 37 (part of the *processor*) extracts TPC bits addressed to the mobile station, which are received from the antenna 31 and high frequency processing unit 32 (*the receiver*). Ex.1005, 10:51-59, 11:6-10, 12:13-15. To the extent it is argued that Dateki does not explicitly disclose that the *receiver* and *processor* of the UE receive the F-DPCH, Dateki suggests it, or at the very least renders it obvious. Ex.1003, ¶84. Dateki's communication protocols and mechanisms are directed to wireless communication protocols related to code division multiple access (CDMA), also known as "3G." Ex.1005, 4:15-17 (F-DPCH is part of 3GPP W-CDMA system), 10:8-13 (mobile station illustrated in FIG. 4 uses CDMA scheme). It would have been obvious for a CDMA mobile station to use its *processor* (e.g., the above-identified components in the yellow box of Dateki's FIG. 4 (Ex.1005, 10:15-20, 10:51-59)) and *receiver* (e.g., Dateki's antenna 31 and high frequency processing unit 32) (Ex.1005, 10:25-27)) to receive and extract the TPCC information, because this is the circuitry provided in a mobile station to perform these functions, as described above in limitation [1.1].

Ex.1003, ¶¶84-85.

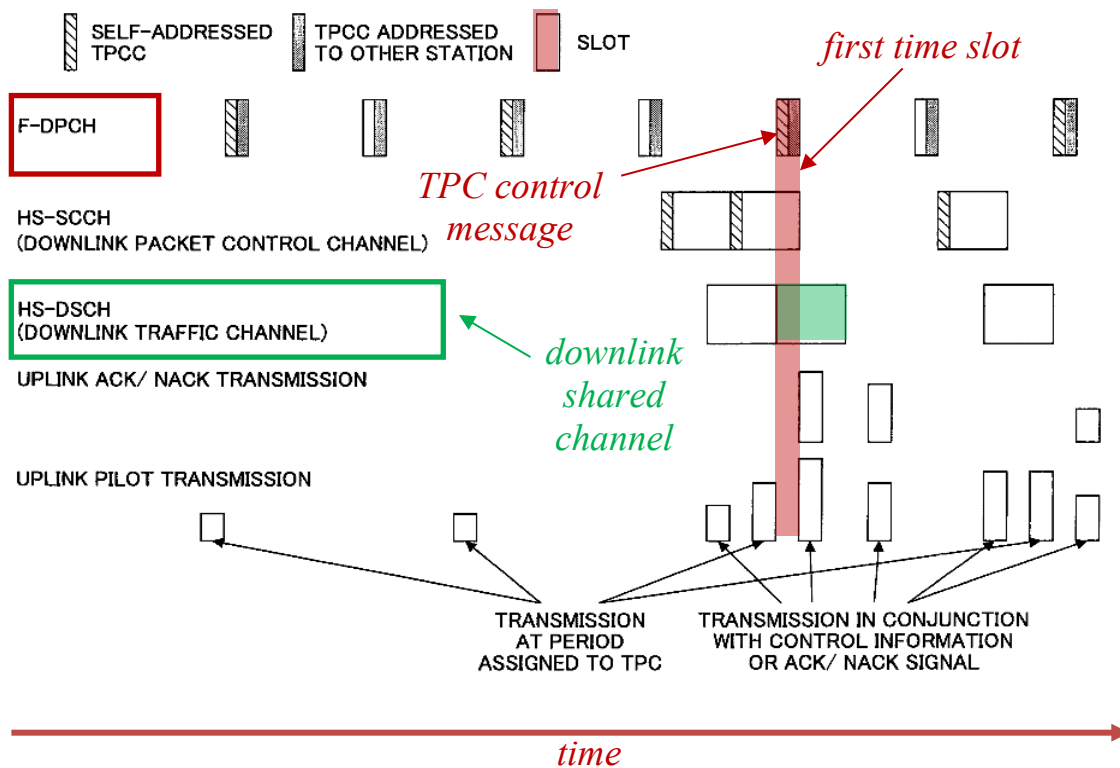
[1.3] wherein the first time slot also includes a downlink shared channel,

Dateki discloses or renders obvious limitation [1.3]. Ex.1003, ¶¶86-92.

As explained in [1.2], Dateki discloses the UE receiving power control information in a time slot over a fractional dedicated physical channel (F-DPCH) (*physical control channel*). Ex.1003, ¶86.

Dateki discloses that the UE receives data in the same time slot over a “High Speed Physical **Downlink Shared Channel** (HS-PDSCH),” which is an example of the *downlink shared channel* in limitation [1.2]. Ex.1005, 12:5-6, 14:26-28; Ex.1003, ¶87. Dateki describes HS-PDSCH as a “downlink traffic channel,” and a “shared channel.” Ex.1005, 12:5-7, 14:26-28; Ex.1003, ¶87.

Dateki’s FIG. 6, annotated below, illustrates transmitting the TPCC in the F-DPCH in a time slot and concurrently transmitting data in the HS-PDSCH (listed in figure as “HS-DSCH”) (*downlink shared channel*) within the same time slot. Ex.1005, FIG. 6; Ex.1003, ¶88. Specifically, the TPCC command in the F-DPCH is vertically aligned with the transmission in the HS-PDSCH (green) indicating that they are transmitted in the same time slot:



Ex.1005, FIG. 6 (annotated); Ex.1003, ¶88.

Therefore, Dateki discloses that a UE receives a TPC command (*a control message*) over a F-DPCH (physical control channel) [1.2], and also discloses the UE receiving the TPC command in the F-DPCH that is within the same time slot (*the first time slot*) in which the HS-PDSCH (*downlink shared channel*) is transmitted. Ex.1003, ¶89. Accordingly, Dateki discloses or renders obvious that *the first time slot also includes a downlink shared channel*. Ex.1003, ¶¶89-92.

Thus, Dateki discloses or renders obvious limitation [1.3].

[1.4] wherein the control message has power control bits for a plurality of UEs, wherein the plurality of UEs include the first UE,

Dateki discloses limitation [1.4]. Ex.1003, ¶¶93-101.

As similarly explained above at [1.2], Dateki explains that “[t]he F-DPCH corresponds to a channel that is capable of transmitting a slot **including plural TPC bits addressed to differing mobile stations.**” Ex.1005, 12:13-15. Dateki’s “plural TPC bits” are *power control bits for a plurality of UEs*. Ex.1003, ¶93.

In more detail, Dateki explains that, during the 3GPP standards process for CDMA, also known as 3G, F-DPCH was introduced for transmitting “transmission power control (TCP) information of a dedicated channel for plural users.” Ex.1005, 4:16-21. In F-DPCH, the TPC commands for the multiple UEs are encoded using “the same code to conduct a diffusion process and time division multiplexing with respect to TPC bits and pilot signals of plural users....” Ex.1005, 4:35-38; Ex.1003, ¶94. Thus, Dateki’s “plural TPC bits addressed to differing mobile users” are processed together in a transmitter using a “same code to conduct a diffusion process.” Ex.1003, ¶94. A POSITA would have understood that the plural TPC bits processed using a same diffusion code discloses or at least renders obvious *a control message* having the TPC bits. Ex.1005, 4:35-38; Ex.1003, ¶95. Thus, Dateki discloses that the plural TPC bits addressed to differing mobile stations (*control message*) includes *power control bits for a plurality of UEs*. Ex.1003, ¶95.

Further, Dateki explains that the TPCC extracting unit 37 of the mobile station (*the first UE*) extracts its TPC bits from the plural TPC bits addressed to the plural UEs. Ex.1005, 10:51-59, 11:6-10, 12:13-15. For example, in a mobile

station, an “DCH inverse diffusion unit 35 conduct inverse diffusion processes on the input signal using the respective diffusion codes used in the corresponding diffusion processes conducted at the transmission side.” Ex.1005, 10:37-42. In this way, the mobile station processes the TPC bits together (as a *control message*) before extracting the TPC bit that conveys power control for that mobile station. Thus, Dateki also discloses that *the plurality of UEs include the first UE*. Ex.1003, ¶96.

Accordingly, Dateki discloses *wherein the control message has power control bits for a plurality of UEs, wherein the plurality of UEs include the first UE*. Ex.1003, ¶97

[1.5] the processor is further configured to extract power control information for the first UE from the control message, and

Dateki discloses limitation [1.5]. Ex.1003, ¶¶98-101.

As discussed in association with [1.2] and shown in Fig, 6, Dateki’s UE receives a TPCC (transmit power control command). Ex.1005, 11:6-11, 12:13-16, FIG. 6. Dateki explains that the TPCC extracting unit 37 of the mobile station (part of *the processor*) extracts *power control information* from the TPCC (hence the name “TPCC extracting unit”):

Also, inverse diffusion outputs including transmission power control information that are obtained by inverse diffusion processes conducted by the TCH inverse

diffusion unit 34 and the DCH inverse diffusion unit 35, respectively, are input to **the TPCC extracting unit 37 at which the transmission power control information is extracted**. The extracted transmission power information is then input to the transmission power control unit 38.

Ex.1005, 10:51-59; Ex.1003, ¶98.

As explained above, Dateki discloses transmitting transmission power control information for multiple UEs in the same F-DPCH, where the power control information includes “*plural TPC bits addressed to different mobile stations.*” Ex.1005, 12:13-15; Ex.1003, ¶99.

Accordingly, a POSITA would have understood that Dateki’s TPCC extracting unit 37, which is part of *the processor*, extracts *power control information for the first UE from the control message*. Ex.1005, 10:51-59; Ex.1003, ¶¶100-101.

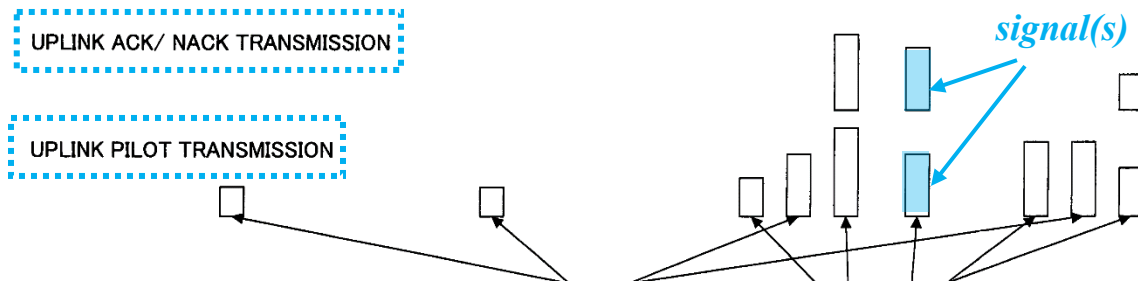
Thus, Dateki discloses *the processor is further configured to extract power control information for the first UE from the control message*.

[1.6] the transmitter and the processor are configured to transmit a signal over a physical control channel to a base station in a second time slot at a transmission power level based on the extracted power control information.

Dateki discloses or renders obvious limitation [1.6]. Ex.1003, ¶¶102-111.

First, Dateki discloses that the UE transmits an “ACK/NACK signal” and uplink pilot signals (also referred to as pilot “symbols”) to the base station. *See*

Ex.1005, 12:4-10, 10:60-62. Each of these signals, shown in FIG. 6 of Dateki, is a *signal*. Ex.1003, ¶102.



Ex.1005, FIG. 6 (partial, annotated); Ex.1003, ¶102.

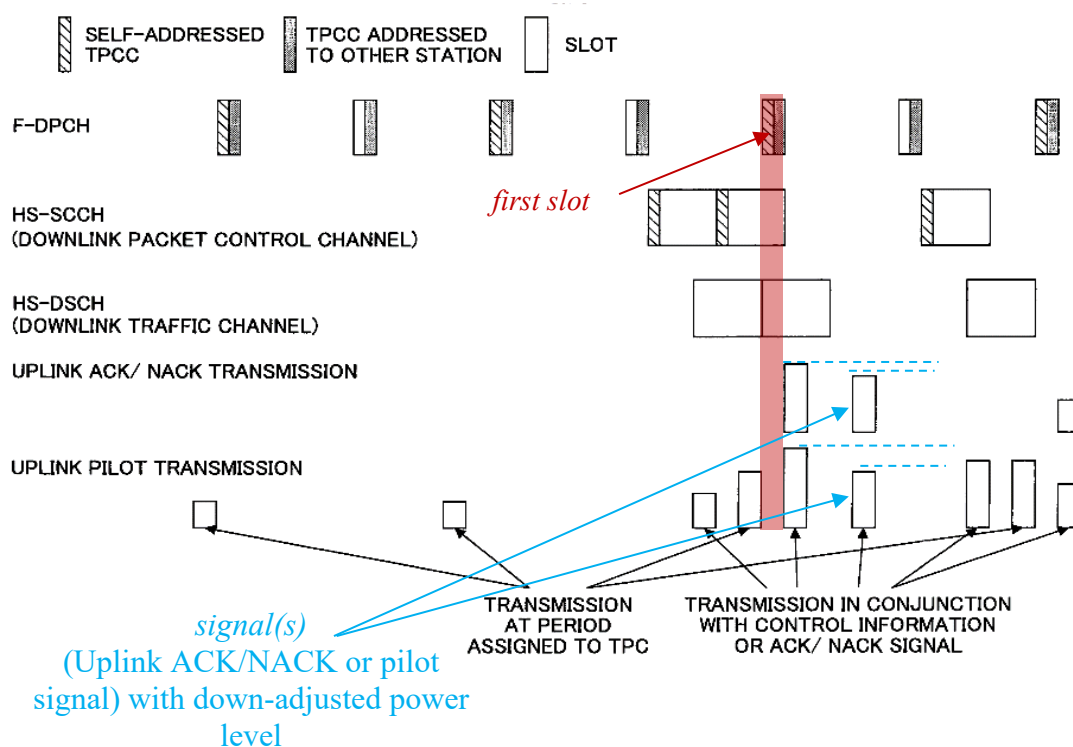
Thus, either the ACK/NACK signal transmission or the uplink pilot signal transmission discloses “*transmit a signal*.” Ex.1003, ¶103. Both options are discussed together below.

Dateki teaches using the extracted TPC command to set a transmission power level for the pilot symbols and the ACK/NACK signals:

Also, according to the present embodiment, uplink traffic data, **a pilot symbol, and a ACK/NACK signal**...are input to the diffusion units 45, 46, and 47, respectively, to be diffused by differing diffusion codes. Then the diffused **signals** are multiplexed at the multiplexing unit 44, and multiplied at the multiplying unit 43 by **a control value from the transmission power control unit 38 to realize transmission power control**.

Ex.1005, 10:60-11:1; Ex.1003, ¶104.

FIG. 6, annotated below, illustrates adjusting the power level of ACK/NACK transmissions and pilot signals based on the TPCC information. In the figure, the height of the boxes for the various signals illustrates the power level. See Ex.1005, 11:26-28 (explaining, with respect to similar FIG. 5, that the height of the signal boxes indicates the power level). Ex.1003, ¶105.



Ex.1005, FIG. 6 (annotated); Ex.1003, ¶105.

As shown in annotated FIG. 6 above, the height of the second ACK/NACK signal and second pilot signal changes after the UE receives and extracts the TPCC information from the F-DPCH. Thus, the second uplink ACK/NACK signal, or the pilot signal, (*a signal*) is transmitted *based on the extracted power control*

information. Ex.1003, ¶106.

Second, Dateki teaches that ACK/NACK signals and other control signals are sent over “control channels” like the High-Speed Dedicated Physical Control Channel (HS-DPCCH) (*physical control channel*):

The channels HS-SCCH, HS-PDSCH, and **HS DPCCH** correspond to **control channels** as described above, and the HS-DPCCH is **used to transmit the CQI and ACK/NACK signals**.

Ex.1005, 2:67-3:3; Ex.1003, ¶107.

Dateki also teaches that pilot signals are transmitted via dedicated physical channels (DPCHs) (*physical control channel*, alternatively):

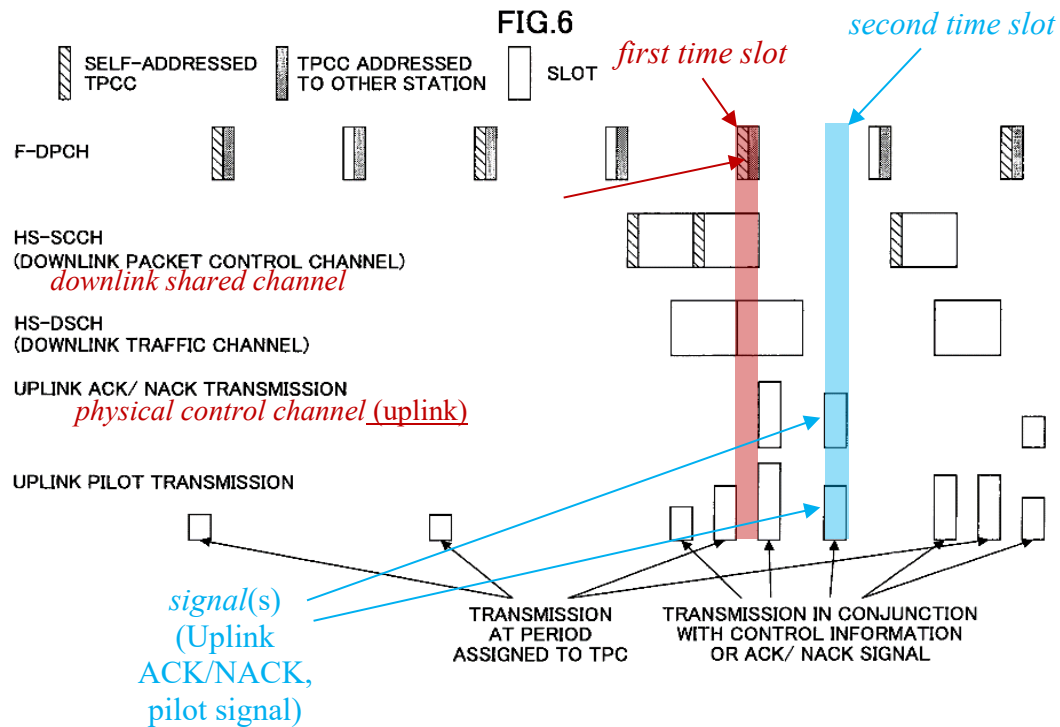
On the other hand, in a packet communication scheme using shared channels such as the HS-PDSCH, **pilot signals** and TPC bits are periodically transmitted via **uplink** and downlink **DPCH** channels....

Ex.1005, 4:59-62; *see also* 12:9-10 (explaining that uplink pilot transmission corresponds to a DPCH); Ex.1003, ¶108.

Thus, Dateki’s ACK/NACK signals and uplink pilot signals are transmitted on respective *physical control channel(s)*. Ex.1003, ¶109.

Third, Dateki teaches transmitting the ACK/NACK signal and pilot signal in a different (*second*) time slot than the received TPC commands. For instance,

Dateki's FIG. 6 shows that an ACK/NACK and uplink pilot signal are transmitted in a second time slot that is subsequent to the first time slot in which the F-DPCH is received. Ex.1003, ¶110.



Ex.1005, FIG. 6 (annotated); Ex.1003, ¶110.

Thus, Dateki discloses or renders obvious limitation [1.6]. Ex.1003, ¶111.

3. Claim 2

[2.1] The first UE of claim 1 wherein the signal transmitted over the physical control channel is produced using a code sequence, wherein a plurality of UEs transmit in the second time slot using different code sequences.

Dateki discloses or renders obvious limitation [2.1]. Ex.1003, ¶¶112-117.

First, as explained above with respect to limitation [1.6], Dateki's uplink

ACK/NACK signal or the uplink pilot signal discloses *the signal transmitted over the physical control channel*. Ex.1003, ¶112.

Second, mobile stations applying *different code sequences* to their uplink signals for transmission in the same time slot as the ACK/NACK and/or pilot signal (*in the second time slot*) would have been an obvious and expected part of Dateki's Wideband **Code** Division Multiple Access (W-CDMA) communication scheme. *See*, Ex.1005, 2:1-3, 4:16-22, 4:53-55, 10:8-13; Ex.1003, ¶113. Dateki explains that the F-DPCH power control features disclosed above were implemented in the W-CDMA protocols:

Also, to enhance the **W-CDMA system**, use of the **F-DPCH...is proposed (e.g. see 3GPP R1-031073)**.

Ex.1005, 4:16-18; Ex.1003, ¶113.

As explained in the Technology Background above, in CDMA, each mobile station applies its own spreading code and scrambling code (also called a diffusion code) to uplink signals. *See* §IV.A. In this way, signals from multiple mobile stations (*plurality of UEs*) may be transmitted in the same time resources and in the same frequency band without interfering. *See* Ex.1011, 321-325; Ex.1003, ¶114.

Consistent with W-CDMA, Dateki discloses that the uplink ACK/NACK signals and pilot signals are “diffused by differing **diffusing codes**” (*produced using a code sequence*), and multiplexed for transmission to the base station.

Ex.1005, 10:60-11:1; Ex.1003, ¶115.

It would have been an expected and conventional part of Dateki's W-CDMA-based communications for other mobile stations (*a plurality of UEs*) to transmit uplink signals using their own spreading codes and/or scrambling codes (*using different code sequences*). Ex.1003, ¶116. In such a W-CDMA scheme, the same time slots are used by multiple devices for uplink transmissions. Ex.1003, ¶116. It would have been obvious for other UEs having control signals (e.g., pilot signals, ACK/NACK) to each transmit in *the second time slot* during which *the first UE* transmits *the signal*, because the mobile stations apply *different code sequences* to their uplink signals for transmission in the same time slot as the ACK/NACK and/or pilot signal, as discussed above. *See*, Ex.1005, 2:1-3, 4:16-22, 4:53-55, 10:8-13. In other words, because multiple UEs are using different code sequences in CDMA and W-CDMA, multiple UEs may transmit uplink signals in the same time slot to conserve network resources. Ex.1011, 162-165; Ex.1013, 321-324. Thus, it would have been obvious to a POSITA for *a plurality of UEs* to *transmit in the second time slot using different code sequences*. Ex.1003, ¶116.

Accordingly, Dateki renders obvious limitation [2.1].

4. Claim 5

Claim 5 is a method claim that is analogous to apparatus claim 1. As confirmed in the chart below, the steps of claim 5 are nearly identical to the steps

performed by the *transmitter, receiver, and processor* of claim 1. Any differences in wording between the two claims are insignificant and do not affect the grounds of unpatentability presented above for claim 1. For instance, claim 5 recites the steps being performed by *the first UE*, and claim 1 recites the steps being performed by one or more of the *receiver, transmitter, or processor of the first UE*.

Claim 1	Claim 5
A first user equipment (UE) comprising: a transmitter; a receiver; and a processor, operatively coupled to the transmitter and the receiver, wherein:	A method performed by a first user equipment (UE), the method comprising:
the receiver and the processor are configured to receive a control message over a physical control channel in a first time slot, wherein the first time slot also includes a downlink shared channel,	receiving, by the first UE, a control message over a physical control channel in a first time slot, wherein the first time slot also includes a downlink shared channel,
wherein the control message has power control bits for a plurality of UEs, wherein the plurality of UEs include the first UE,	wherein the control message has power control bits for a plurality of UEs including the first UE;
the processor is further configured to	extracting, by the UE, power control

extract power control information for the first UE from the control message, and	information for the first UE from the control message; and
the transmitter and the processor are configured to transmit a signal over a physical control channel to a base station in a second time slot at a transmission power level based on the extracted power control information.	transmitting, by the UE, a signal over a physical control channel to a base station in a second time slot at a transmission power level based on the extracted power control information.

Claim 5 is therefore obvious over Dateki for the same reasons explained above with respect to claim 1. *See* §XI.C.2; Ex.1003, ¶¶118-119

5. Claim 6

Claim 6 is a method claim corresponding to apparatus claim 2. Dateki renders claim 6 obvious for the same reasons described above with respect to claim 2. *See* §XI.C.3; Ex.1003, ¶120.

D. Ground 2: Claims 3 and 7 are obvious over Dateki in view of Mate

1. Mate

Mate relates to UMTS communication protocols for communications between UEs and base stations. Ex.1009, [0001]-[0004]. Mate describes “downlink switching” procedures for switching UEs in a network between different connected states, such as cell_DCH, and cell_FACH. Ex.1009, Abstract, [0010], [0013]; *see*

infra, §XI.E.1 (discussing different requirements and services for cell_DCH and cell_FACH); Ex.1003, ¶121.

Mate explains that the UMTS protocol includes a variety of physical channels, which are mapped to different transport channels:

Physical channels and transport channels are specified in 3GPP TS 21.211 V3.4.0 (2000-9). In particular, the DSCH transport channel is mapped onto the Physical Downlink Shared Channel (pDSCH); **the CPCH is mapped to the Physical Common Packet Channel (pCPCH)**; and the DCH is mapped to the dedicated physical channel DPCH....

Ex.1009, [0005]; Ex.1003, ¶122.

The Physical Common Packet Channel (pCPCH) “has a data part that can carry small amounts of information.” Ex.1009, [0043]. The pCPCH is mapped to the CPCH transport channel, which is “a counter part of the [Downlink Shared Channel (DSCH).” Ex.1009, [0043]. The pCPCH can be used while the UE is still in a “cell_FACH” state, without the need to move to the “cell_DCH” state, which would consume more power and network resources. Ex.1009, [0043], [0044].

Ex.1003, ¶123.

Analogous Art

Like the '889 patent, Mate is directed to UMTS (W-CDMA) wireless

communication protocols. Ex.1009, [0002]-[0005]; Ex.1001, 1:27-32, 4:4-12.

Thus, Mate is in the same field of endeavor as the '889 patent. Ex.1003, ¶124.

Further, Mate describes protocols for a UE to switch between different connected states. Ex.1009, [0015]-[0016]. Thus, Mate is relevant to the particular problem the '889 patent attempts to solve. *See* Ex.1001, 7:4-16 (UE switching between connected states). Ex.1003, ¶125.

2. Reasons to Combine Dateki and Mate

Dateki's F-DPCH procedures are based on W-CDMA technologies standardized by the 3GPP. Ex.1005, 2:1-3, 4:16-22, 4:53-55, 10:8-13. Mate discloses additional W-CDMA-based protocols and features that would have been performed alongside Dateki's F-DPCH procedures in the same 3GPP standardized UMTS system. Ex.1009, [0002]-[0005] (discussing UMTS standards and explaining that PCPCH is a physical channel in the UMTS standards); Ex.1003, ¶126. For instance, the various transport and physical channels Mate describes were part of the same 3GPP-standardized UMTS protocols on which Dateki is based. Ex.1009, [0002]-[0005]; Ex.1031, [0004]; Ex.1003, ¶126. The 3GPP-standardized channels and associated procedures described in Mate therefore provide additional UMTS implementation details that are not explicitly described in Dateki. Ex.1009, [0002]-[0005] (referencing series "25" (TS 25) 3GPP standards documents for UMTS); Ex.1005, 3:18-21, 4:4-15 (same); Ex.1003, ¶126.

In other words, Dateki’s description of the power control mechanisms in the context of W-CDMA-based standards would have motivated a POSITA to use Mate’s additional W-CDMA procedures to comply with the W-CDMA standards. Ex.1003, ¶126. *See, e.g., Samsung Electronics Co., Ltd. et al. v. Netlist Inc.*, IPR2023-00455 Paper 30, 33 (PTAB July 30, 2024) (finding obviousness of implementing according to known standards: “Given JEDEC as the standard, an ordinarily skilled artisan would have reason to pursue such a known option”).

A POSITA would have found it beneficial to implement base stations and terminals according to the known 3GPP standards on which both Dateki and Mate are based to ensure compatibility and marketability of the product. Ex.1003, ¶127. Moreover, a POSITA would have found it beneficial and advantageous to implement such devices with standardized techniques that have already been well vetted and tested for workability. Ex.1003, ¶127. For instance, the pCPCH channel described by Mate allows the UE to transmit small amounts of data without the need to transition to a cell_DCH state. Ex.1009, [0043], [0044] (“...the UE maintains the cell_FACH state in the messaging period, without the need of switching to the cell_DCH state.”). The combination is nothing more than the predictable use of prior art elements (Mate’s uplink common packet channel and Dateki’s W-CDMA-based power control mechanisms) according to their established functions (UMTS-standardized common data channel

communications). *See KSR Int'l v. Teleflex Inc.*, 550 U.S. 398, 417 (2007); Ex.1003, ¶127.

Further, modifying Dateki with Mate would have been the combination of prior art elements (Mate's uplink common packet channel and Dateki's W-CDMA-based power control mechanisms) according to known methods (3GPP physical layer procedures between UEs and base stations) to yield predictable results (a more comprehensive W-CDMA communication protocol compliant with UMTS). Ex.1003, ¶128. The results would have been predictable because the combined W-CDMA protocols, including Dateki's F-DPCH power control procedures and Mate's pCPCH, had already been standardized and in use for some time. Ex.1009, [0005] (pCPCH standardized in 3GPP TS 21.211 v3.4.0); Ex.1005, 4:16-18; Ex.1003, ¶128.

A POSITA also would have had a reasonable expectation of success because both Dateki and Mate are directed to cellular communication systems that follow 3GPP standards for W-CDMA. *See* Ex.1005, 4:4-22 (describing use of HSDPA channels and F-DPCH as standardized by 3GPP); Ex.1009, [0003] ("UE radio transmission and reception (FDD) is described in the Technical Specification (TS) 25.101 v 3.1.0 (1999-12) of the Third Generation Partnership Project (3GPP) and documents referenced therein"). Accordingly, both Dateki and Mate describe known methods according to 3GPP standards. Ex.1003, ¶129.

3. Claim 3

[3.1] The first UE of claim 1 wherein the transmitter and the processor are further configured to transmit data over a physical shared channel in a third time slot

Dateki and Mate render obvious limitation [3.1]. Ex.1003, ¶¶130-143.

First, Dateki explains that the mobile station transmits “uplink traffic data”:

Also, according to the present embodiment, **uplink traffic data**, a pilot symbol, and a ACK/NACK signal based on the reception processing result of processing downlink traffic data output are input to the diffusion units 45, 46, and 47, respectively, to be diffused by differing diffusion codes.

Ex.1005, 10:60-64.

Thus, Dateki discloses that the mobile station is configured to *transmit data*.

Ex.1003, ¶¶130-131.

Second, it would have been obvious for the mobile station to transmit the uplink traffic data *over a physical shared channel*. Ex.1003, ¶132. Dateki discloses that its communication procedures are based on the W-CDMA protocols standardized in the UMTS. It was well known that UMTS included *shared* data channels that could be used for uplink or downlink data. *See* Ex.1005, 2:19-23; Ex.1008, 47, 48 (listing shared downlink and uplink channels); Ex.1009, [0030], [0074]. Ex.1003, ¶132.

For instance, Mate explains that the UMTS standards included “**Physical Common** Packet Channel (pCPCH).” Ex.1009, [0005]. pCPCH is the physical channel assigned to the “Uplink Common Packet Channel (CPCH),” which is a transport channel. Ex.1009, [0004], [0005]. The CPCH, via the pCPCH, is “intended to carry packet data in the uplink direction.” Ex.1009, [0004]. Mate explains that the “pCPCH has a data part that can carry small amounts of uplink information.” Ex.1009, [0043]. Mate further explains that “a single CPCH can be time-division **shared** between different bearers of different UEs in a similar manner as the [Downlink Shared Channel (DSCH)].” Ex.1009, [0070]; *see also*, Ex.1031, [0024]-[0026], [0030], [0074] (confirming pCPCH was a well-known UMTS shared uplink channel). Thus, pCPCH discloses *a physical **shared** channel*. Ex.1003, ¶¶133-134.

A POSITA would have found it obvious for Dateki’s uplink traffic data (*data*) to be transmitted using Mate’s pCPCH channel (*physical shared channel*) because pCPCH is another part of the comprehensive 3GPP-standardized UMTS protocols on which Dateki is based. *See* §§IV.A, B; Ex.1003, ¶135. In other words, Mate teaches conventional implementation details of the 3GPP UMTS standard that Dateki does not explicitly describe, but would utilize. Ex.1003, ¶¶135-136.

Third, it would have been obvious for the mobile station to transmit the uplink traffic data in *a third time slot* different from (for instance, after) the *first*

and *second time slots*. Ex.1003, ¶137. The transmission timing of uplink pilot signals and ACK/NACK (*the signal*) is based either on a periodic configured schedule, or on the timing of the received downlink traffic. Ex.1005, 12:37-41, 53-60; Ex.1003, ¶137. A POSITA would have understood that the transmission of uplink traffic data would be triggered by a different event (e.g., uplink data arriving in buffer from higher layers) than the uplink pilot and ACK/NACK signals. Ex.1003, ¶¶137-139 (citing Ex.1032, [0120]; Ex.1033, [0004]-[0005]).

Additionally, Mate explains that the pCPCH (mapped to CPCH transport channel) is used when the UE is in the “cell_FACH” state. Ex.1009, [0004]. Dateki’s ACK/NACK signal (*the signal*) is transmitted on the High-Speed **Dedicated** Physical Control Channel (HS-DPCCH). Ex.1005, 2:67-3:3. Dateki’s pilot signal (*the signal*, alternatively) is transmitted on the **Dedicated** Physical Channel (DPCH). Ex.1005, 4:59-62, 12:9-10. Those dedicated channels are only available when the UE is in a dedicated connected state—specifically the cell_DCH state. Ex.1009, [0004]. A POSITA would have understood that the UE would not be in the cell_DCH state and the cell_FACH state at the same time. Ex.1008, 89 (“...the UE can be in **one** of four states,” including CELL_DCH and CELL_FACH); Ex.1009, [0010] (UE is either in cell_FACH or cell_DCH); Ex.1003, ¶¶140-141. Further, a PCPCH is available for transmission by the UE only at “specific access time slots.” Ex.1031, [0030]; Ex.1003, ¶142.

It would have been obvious for the mobile station to transmit uplink data in *a third time slot* once the mobile station has uplink traffic data to transmit.

Ex.1003, ¶143. Further, because the UE transmits the data using the pCPCH, it would have been obvious for the UE to transmit the data in a specific access time slot” (*third time slot*) for the pCPCH, which only becomes available once the UE has moved from the cell_DCH state to the cell_FACH state. Ex.1003, ¶143.

Thus, Dateki and Mate render obvious limitation [3.1].

[3.2] and the transmitter and the processor are further configured to not transmit the signal over the physical control channel at a same time that data over a physical shared channel is transmitted.

Dateki renders obvious limitation [3.2]. Ex.1003, ¶¶145-147.

As explained above with respect to limitation [3.1], it would have been obvious for Dateki’s mobile station to transmit the uplink traffic data in a different slot than the pilot symbol and/or the ACK/NACK. Transmitting uplink data in the pCPCH would have occurred when the UE is in the Cell_FACH state, while transmitting the ACK/NACK signal or pilot signal would have occurred when the UE is in the Cell_DCH state. Ex.1009, [0004] (CPCH is transmitted in Cell_FACH state); Ex.1003, ¶145. A POSITA would have understood that the UE would not have held these two states simultaneously. Ex.1008, 89 (“...the UE can be in **one** of four states,” including CELL_DCH and CELL_FACH.); Ex.1003, ¶¶145-146. Accordingly, it would have been obvious for the UE to transmit the *data* at a

different time than the UE transmits *the signal*. Ex.1003, ¶146.

Thus, Dateki and Mate render limitation [3.2] obvious. Ex.1003, ¶147.

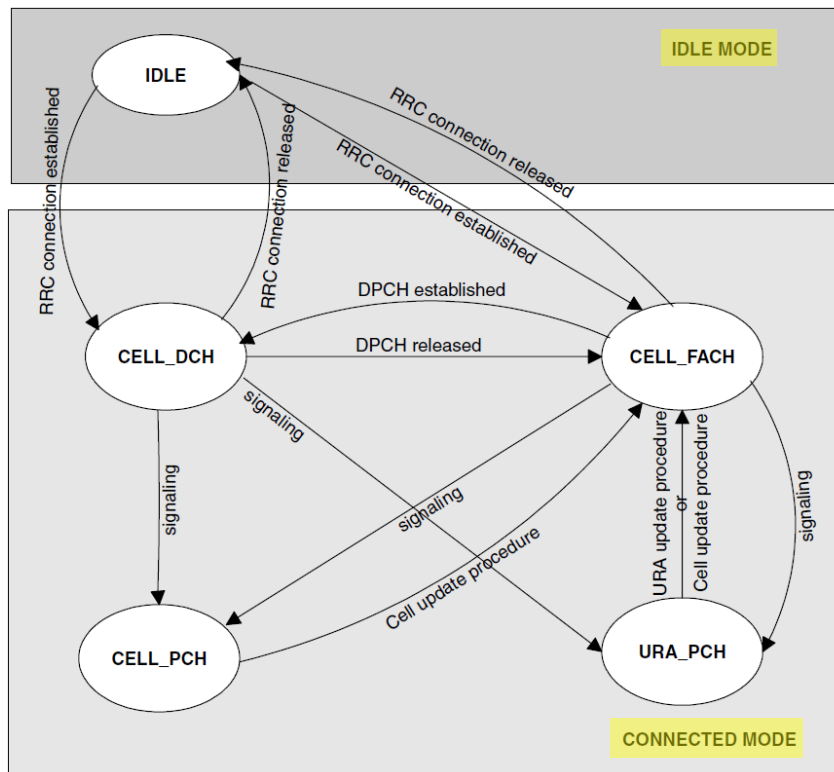
4. Claim 7

Claim 7 is a method claim corresponding to apparatus claim 3. Dateki renders claim 7 obvious for the same reasons described above with respect to claim 3. *See* §XI.D.3; Ex.1003, ¶148.

E. Ground 3: Claims 4 and 8 are obvious over Dateki in view of Chitrapu

1. Technology Background – Connection States and Random Access

3G protocols use different modes or “states” corresponding to the level of activity a mobile device has with the network. Ex.1008, 89. These connection states are governed by the Radio Resource Control (RRC) layer, and are categorized into “Idle” modes, and “connected” modes. Ex.1003, ¶149.

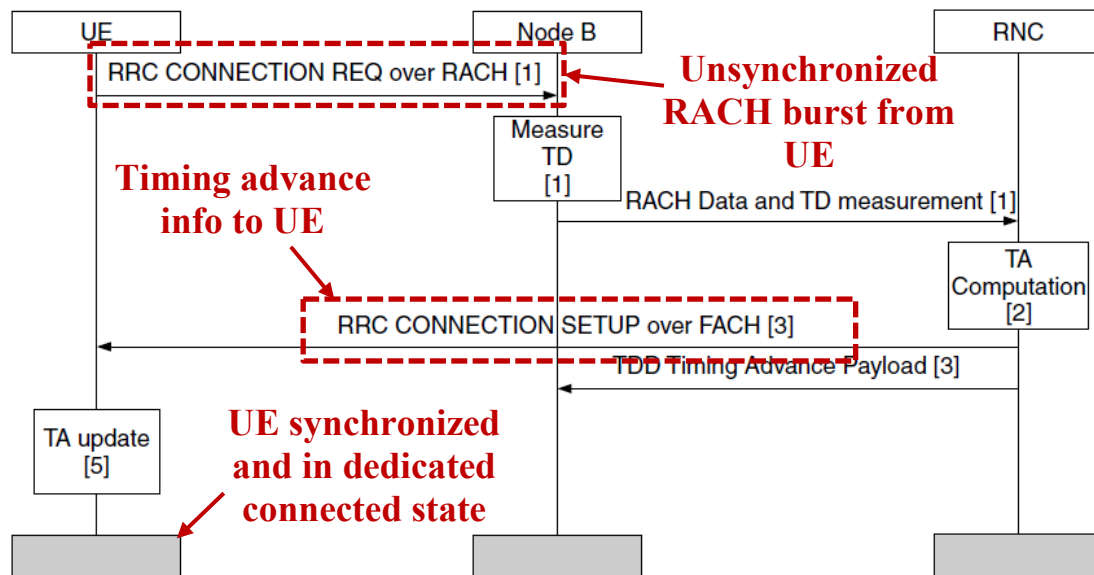


Ex.1008, FIG. 5.1; Ex.1003, ¶149.

For instance, the mobile device enters an Idle mode if (1) a mobile device does not have data to transmit or receive, or (2) the mobile device moves out of range of the cell to which it was previously connected. In Idle mode, the mobile device's contact with the network is limited. Ex.1008, 89-91. This limited contact reduces the amount of power and network resources the mobile device would otherwise use if it stayed connected to the network continuously. When the mobile device wants to use network services (e.g., receive a data stream), the mobile device initiates a random access procedure to request to enter a connected state in a given cell. Ex.1008, 89-91; Ex.1003, ¶150.

Many 3G network services, such as high-speed data communication, are often only available through dedicated channels. Those dedicated channels typically rely on the mobile device keeping tight time synchronization with the network's cell tower. Ex.1008, 39, 104. When the mobile device is in an Idle, or disconnected state, there is usually insufficient time synchronization to use dedicated channels. Ex.1008, 53. By initiating the random access procedure to enter the RRC connected state, the mobile device may obtain the level of time synchronization required for those dedicated channels. Ex.1008, 105, 120-121; Ex.1003, ¶151.

The random access procedure involves the mobile device using a Random Access Channel (RACH) to request to move to a connected state. Ex.1008, 120-121. RACH is a shared uplink channel used for transmitting short signaling messages, sometimes called "preambles," or "bursts." Ex.1008, 120. One feature of the RACH is that devices do not need to be closely time-synchronized with the network to initiate access. Ex.1008, 23, 120. When a mobile device wants to connect, it sends a signal (RACH burst) on the RACH channel indicating a request to connect. Ex.1008, 120-121. The base station then responds with a timing adjustment and grant message, allowing the device to begin the connection process. Ex.1008, 120-121; Ex.1003, ¶152.



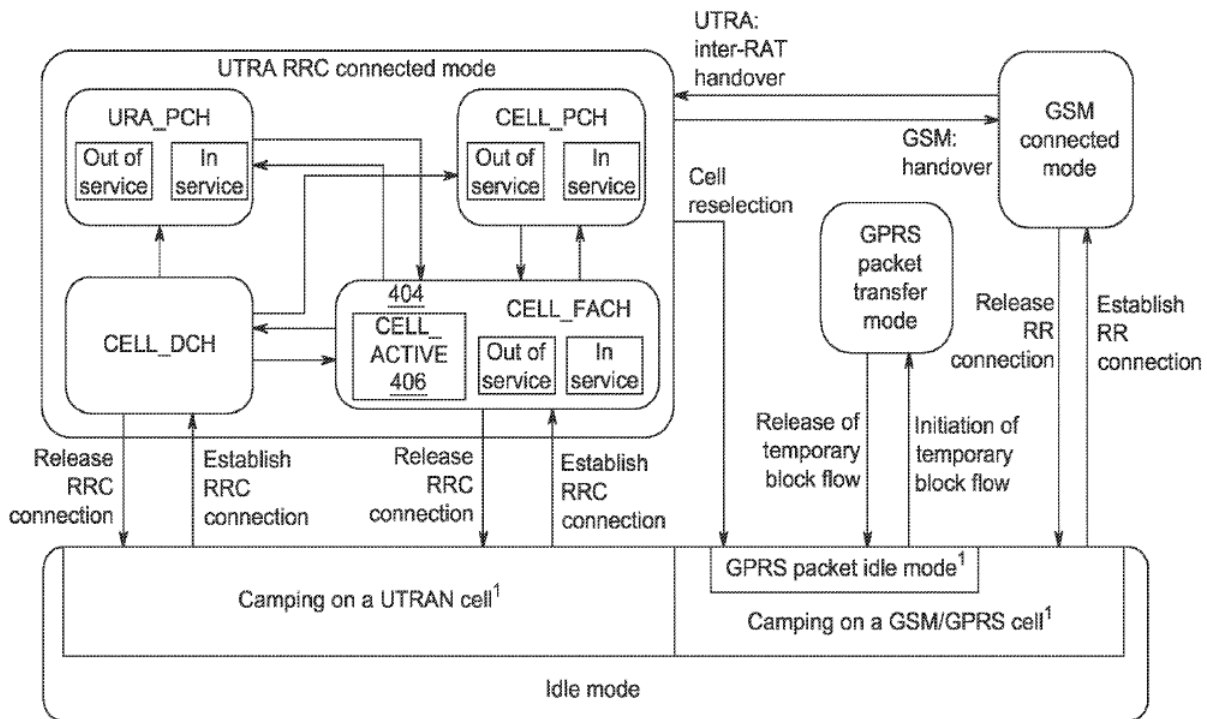
Ex.1008, Fig. 5.24 (annotated); Ex.1003, ¶152.

Once the device has successfully connected to the network, it transitions into different Radio Resource Control (RRC) connected states, such as Cell_DCH (Dedicated Channel), where the device is actively communicating, or Cell_FACH (Forward Access Channel), where the device is connected but transmitting less data. Ex.1008, 89-91. Each of these connected states is associated with different types of channels, and allows for different types and levels of services. For instance, Cell_FACH has less stringent time synchronization requirements than Cell_DCH, but Cell_DCH supports more advanced services and channels (e.g., faster data speeds). Ex.1008, 89-91, Fig. 5.1. Time synchronization in these states ensures that the device's transmissions align with the network's scheduling,

reducing interference and optimizing network performance. Ex.1003, ¶153.

2. '889 Patent – Connection States and Time Synchronization

The '889 patent also describes procedures to change between RRC connected and disconnected states, such as CELL_DCH, and CELL_FACH, and Idle. Ex.1001, 7:4-16. The '889 patent acknowledges that many of these states were known and relate to the UMTS/UTRAN standards. Ex.1001, 7:4-11. This is consistent with the W-CDMA standards as discussed in the Technology Background above. *See supra*, §XI.E.1. FIG. 4 of the '889 patent illustrates those various states and the random access procedures to move between them. Ex.1003, ¶46.



Ex.1001, FIG. 4; Ex.1003, ¶46.

The '889 patent explains that when a UE is determined to be out-of-synchronization, the UE must move out of the RRC-connected states:

Note that UEs in CELL_ACTIVE state have their transmitters active, therefore it is necessary for these UEs to monitor the status of the downlink and automatically **come out of CELL_ACTIVE state if the downlink is deemed to be out-of-synchronization** (for example, very high downlink errors or low received signal strength)

Ex.1001, 7:38-43; Ex.1003, ¶47.

The '889 patent's description of the UE moving out of an RRC connected state when it loses synchronization is consistent with 3G cellular technologies at

the time, as explained in the Technology Background above. *See supra*, §XI.E.1; Ex.1003, ¶48.

3. Chitrapu

Chitrapu is entitled “Wideband TDD: WCDMA for the Unpaired Spectrum.” Ex.1008, cover. Chitrapu explains that Wideband TDD (WTDD) “is a radio interface technology that combines the best of WCDMA and TDMA.” Ex.1008, 2. Some of Chitrapu’s teachings relate to particular implementations of W-CDMA which were proposed, but not necessarily adopted. However, the portions of Chitrapu relied upon in this Petition describe the W-CDMA protocols as adopted into the UMTS by the 3GPP. *See* Ex.1008, 3, 4 (explaining that disclosed Wideband TDD build onto standardized W-CDMA protocols); Ex.1003, ¶154.

Chitrapu describes the random access procedures for WCDMA. For instance, Chitrapu explains that WCDMA relies on time synchronization between the UE and the network:

It should be noted that the received chips and the spreading code should **be synchronized in time** for the correlation operation.

Ex.1008, 39; Ex.1003, ¶155.

A UE that desires to enter an RRC connected state from an Idle mode

performs a random access procedure via a random access channel (RACH):

Random Access procedure is the means by which a UE in the Idle Mode or CELL FACH/CELL PCH/URA PCH states of the Connected Mode can request access for Network Services.

Ex.1008, 97; Ex.1003, ¶156.

To initiate a RACH procedure, a UE transmits a “PRACH burst,” which is also referred to as a “RACH burst.” Ex.1008, 98, 120. The PRACH burst initiates a connection procedure, resulting in the UE receiving timing advance information to time synchronize with the network. Ex.1008, 120; Ex.1003, ¶157.

Analogous Art

Like the '889 patent, Chitrapu is directed to CDMA-based wireless network protocols. Ex.1008, 4; Ex.1001, 1:27-32, 4:4-12. Chitrapu describes random access protocols for a UE to initiate and maintain a reliable connection to the network. Ex.1008, 97-106. Thus, Chitrapu is in the same field of endeavor as the '889 patent. *See* Ex.1001, 2:38-41 (random access procedures for cellular communications). Ex.1003, ¶158.

Further, Chitrapu describes channel access procedures that facilitate transmission power control when the UE is not synchronized with the network. *See* Ex.1008, 98. Thus, Chitrapu is relevant to the particular problem the '889 patent

attempts to solve. *See* Ex.1001, 2:38-41; Ex.1003, ¶157.

4. Reasons to Combine Dateki and Chitrapu

Dateki's F-DPCH procedures are based on W-CDMA technologies. Ex.1005, 2:1-3, 4:16-22, 4:53-55, 10:8-13. Chitrapu discloses additional W-CDMA-based protocols and features that would have been performed alongside Dateki's F-DPCH procedures. Ex.1008, 3, 4 (explaining that disclosed Wideband TDD build onto standardized W-CDMA protocols), 5-12 (describing UMTS architecture and protocols); Ex.1003, ¶160. In other words, Dateki's description of the power control mechanisms in the context of W-CDMA-based standards would have motivated a POSITA to use Chitrapu's additional teachings concerning W-CDMA technologies to comply with the W-CDMA standards. Ex.1003, ¶160. *See, e.g., Samsung Electronics Co., Ltd. et al. v. Netlist Inc.*, IPR2023-00455 Paper 30, 33 (PTAB July 30, 2024) (finding obviousness of implementing according to known standards: "Given JEDEC as the standard, an ordinarily skilled artisan would have reason to pursue such a known option"); Ex.1003, ¶160.

A POSITA would have found it beneficial to implement base stations and terminals according to the known 3GPP standards on which both Dateki and Chitrapu are based to ensure compatibility and marketability of the product. Ex.1003, ¶161. For instance, Chitrapu's random access procedures for moving a UE between Idle and connected states were conventional implementation details

that a POSITA would have implemented in the same 3GPP W-CDMA protocols on which Dateki is based. Ex.1008, 3, 4; Ex.1003, ¶161. Moreover, a POSITA would have found it beneficial and advantageous to implement such devices with standardized techniques that have already been well vetted and tested for workability. Ex.1003, ¶161. In particular, the random access procedures described by Chitrapu, and adopted by the 3GPP, facilitate mobility by allowing the UE to handover from one cell to the next as the user travels. Ex.1008, 89, 90 (handover procedures facilitated by connection state switching and random access). The random access procedures also facilitate discontinuous reception (DRX) that allow the UE to conserve power when it does not have data to transmit or receive. Ex.1008, 90, 91 (random access and connection state switching facilitates DRX); Ex.1003, ¶161. The combination is nothing more than the predictable use of prior art elements (Chitrapu's W-CDMA-based RACH protocols and Dateki's W-CDMA-based power control mechanisms) according to their established functions (UMTS random access and power control protocols). *See KSR Int'l v. Teleflex Inc.*, 550 U.S. 398, 417 (2007).

Further, modifying Dateki with Chitrapu would have been the combination of prior art elements (Chitrapu's W-CDMA-based random access procedures and Dateki's W-CDMA-based power control mechanisms) according to known methods (3GPP physical layer procedures between UEs and base stations) to yield

predictable results (a more comprehensive W-CDMA communication protocol compliant with UMTS). Ex.1003, ¶162. The results would have been predictable because the combined W-CDMA protocols had already been standardized.

Ex.1008, 149 (referencing 3GPP standard documents for physical layer procedures and procedures for switching between idle mode and connected modes); Ex.1036 (3GPP standard referenced in Chitrapu for switching between idle and connected modes); Ex.1003, ¶162.

A POSITA also would have had a reasonable expectation of success because both Dateki and Chitrapu are directed to cellular communication systems that follow 3GPP standards for W-CDMA. *See* Ex.1005, 4:4-22 (describing use of HSDPA channels and F-DPCH as standardized by 3GPP); Ex.1008, 3, 4, (explaining that disclosed Wideband TDD build onto standardized W-CDMA protocols), 5-12 (describing UMTS architecture and protocols). Accordingly, both Dateki and Chitrapu describe known methods according to 3GPP standards. Ex.1003, ¶163.

5. Chitrapu is a Printed Publication

Chitrapu is a printed publication under pre-AIA 35 U.S.C. §§102(a) and 102(b), and AIA 35 U.S.C. §311(b). Petitioner submits the Declaration of Sylvia Hall-Ellis, Ph.D. (Ex.1010) to show that Chitrapu (Ex.1008) was publicly available well before the earliest priority date of the '889 patent. Dr. Hall-Ellis's Declaration

is accompanied by Attachments 1A-1E, which include the evidence on which Dr. Hall-Ellis relies in making her Declaration, and which demonstrate that Chitrapu was publicly accessible November 23, 2004, which is at least one year before October 13, 2006, the earliest possible priority date of Chitrapu (*see* §VII).

“Public accessibility” is “the touchstone in determining whether a reference constitutes a printed publication.” *In re Hall*, 781 F.2d 897, 899 (Fed. Cir. 1986) (cleaned up). A reference is publicly accessible if it was “made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, can locate it.” *Acceleration Bay, LLC v. Activision Blizzard, Inc.*, 908 F.3d 765, 772 (Fed. Cir. 2018) (cleaned up).

Dr. Hall-Ellis’ Declaration (Ex.1010) shows that Chitrapu was publicly accessible to POSITAs by November 23, 2004, which is more than one year before the earliest priority date of the ’889 patent. Specifically, Chitrapu was publicly available at the Penrose Library at the University of Denver by November 23, 2004. Ex.1010, ¶¶46-48 (citing Attachment 1A). Dr. Hall-Ellis also shows that the MARC record (“Machine-Readable Cataloging” standard) for Chitrapu shows that Chitrapu was indexed and available to other libraries including the British Library and the Library of Congress through the OCLC bibliographic database. Ex.1010, ¶¶31-40 (describing the MARC standard), ¶¶49 (MARC record (Attachment 1B) created by the British Library and available in the OCLC bibliographic database),

¶50 (describing classification of Chitrapu in the Library of Congress classification system, and describing Attachments 1B-1E). Dr. Hall-Ellis explained that Chitrapu was “was publicly available by November 23, 2004, because by that date it had been cataloged and indexed at the British Library, made part of the OCLC bibliographic database, and received in the Penrose Library at the University of Denver.” Ex.1010, ¶51. The November 23, 2004 date of public accessibility is consistent with the copyright date indicated on Chitrapu. Ex.1008, Bates-labeled page 7 (2004 copyright date); Ex.1010, ¶46 (Chitrapu “issued by John Wiley in 2004.”). Accordingly, Chitrapu is a printed publication that was publicly available more than one year before the earliest priority date of the ’889 patent.

6. Claim 4

[4.1] The first UE of claim 1 wherein the transmitter and the processor are further configured to transmit the signal over the physical control channel when time synchronized and to transmit a signal over a random access channel when not time synchronized.

Dateki and Chitrapu render obvious limitation [4.1]. Ex.1003, ¶¶164-173.

Limitation [4.1] relates to the transmissions of two “*signal(s)*” using different channels and with different time synchronization conditions. Ex.1003, ¶164. The parameters of these transmissions are summarized in the table below:

Signal	Channel	Time Synchronization
“ <i>the signal</i> ”	“ <i>physical control channel</i> ”	“ <i>when time-</i>

(ACK/NACK signal or uplink pilot signal)	(HS-DPCCH or DPCH)	<i>synchronized</i>
<i>“a signal”</i>	<i>“random access channel”</i>	<i>“when not time-synchronized”</i>

First, the '889 patent explains that whether transmissions are *time synchronized* or *not time synchronized* depends on whether the UE is in a disconnected state (e.g., Idle) or a connected state (e.g., CELL_DCH). See Ex.1001, Fig. 4, 7:38-43 (UE leaves connected state in response to losing time synchronization); §XI.E.1. Chitrapu similarly explains that the CDMA decoding process relies on time synchronization between the UE and the network:

It should be noted that the received chips and the spreading code should **be synchronized in time** for the correlation operation.

Ex.1008, 39; Ex.1003, ¶165.

Chitrapu further explains that the connected state CELL_DCH is required for dedicated channel transmissions. Ex.1008, 89, 91, 104, 105, 120-121. Thus, in UMTS, dedicated channel transmissions are performed in CELL_DCH with time synchronization, while other transmissions (e.g., RACH transmission) are performed from an Idle state without time synchronization. Ex.1003, ¶166.

Dateki discloses transmitting the ACK/NACK signal and uplink pilot signal (*the signal*) on dedicated physical control channels:

The [High Speed-**Dedicated** Physical Control Channel (HS-DPCCH)] in the mobile wireless communication system corresponds to an uplink dedicated control channel from the mobile station to the base station, and is used upon transmitting from the mobile station to the base station an **ACK signal or a NACK signal** indicating whether data received via the HS-PDSCH are properly received.

Ex.1005, 2:35-40.

...an uplink ACK/NACK transmission (the transmission channel corresponding to a HS-DPCCH), and **an uplink pilot transmission** (the transmission channel corresponding to a [**Dedicated** Physical Channel (DPCH)]) are shown.

Ex.1005, 12:7-10; Ex.1003, ¶167.

A POSITA would have understood that the dedicated W-CDMA channels Dateki describes (e.g., HS-DPCCH, DPCH) are used in a dedicated RRC connected state and depend on time synchronization with the network. *See supra*, §XI.E.1; Ex.1003, ¶168. It would have been obvious for Dateki's mobile station to transmit the pilot symbol or the ACK/NACK signal (*the signal*) when in a connected state (*when time synchronized*), because that is the state in which the dedicated channels can be used. Ex.1003, ¶168. Thus, to the extent Dateki does not explicitly disclose transmitting *the signal when time synchronized*, Dateki renders

it obvious. Ex.1003, ¶168.

Second, as explained above in the Technology Background section, W-CDMA procedures employ a random access procedure to move a mobile device from an Idle state to a connected state (e.g., CELL_DCH, CELL_FACH). §XI.E.1; Ex.1008, 89-91, 120-121. In these procedures, a mobile device that wishes to move into a connected state sends a Random Access Channel (RACH) preamble (*a signal*) over a RACH (*a random access channel*) to the base station. §XI.E.1; Ex.1008, 89-91; Ex.1003, ¶169.

Chitrapu explains that a UE that desires to enter an RRC connected state performs a random access procedure via a Random Access Channel (RACH):

Random Access procedure is the means by which a UE in the Idle Mode or CELL_FACH/CELL_PCH/URA_PCH states of the Connected Mode can request access for Network Services.

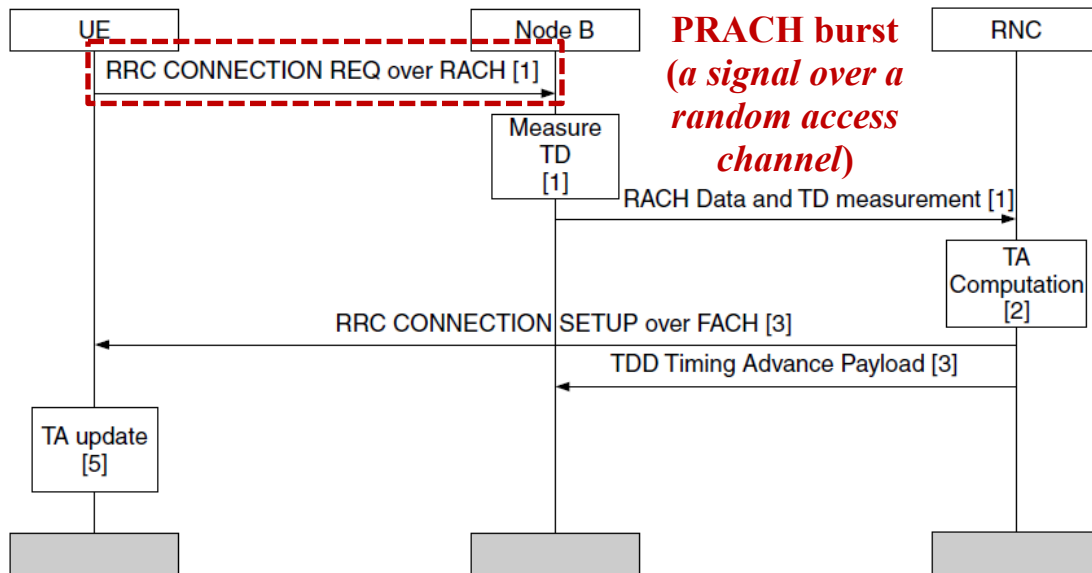
Ex.1008, 97; Ex.1003, ¶170.

The random access channel (RACH) does not require time synchronization like dedicated WCDMA channels do. Ex.1008, 53 (“Since Random Access is used for initial access to UTRAN, the UE does not have tight time synchronization with the UTRAN.”) The random access procedure include the UE selecting a channelization code and transmitting a “PRACH burst.” Ex.1008, 98. The PRACH

burst (*a signal*) facilitates a request to enter an RRC connected state, such as Cell_DCH). Ex.1008, 104, 105. Once requested, the RRC connection procedure includes transmitting timing advance (TA) information to the UE to allow the UE to time synchronize with the network:

In the initial RACH burst, **there is no application of Timing Advance** but it is provided from then on subsequent USCH or DCH bursts. The initial value for the Timing Advance is determined from one or more measurements of Time Delay (TD) of the RACH burst, and signaled to, and implemented in the UE Layer 1 prior to the commencement of user plane traffic.

Ex.1008, 120; Ex.1003, ¶171.



Ex.1008, Fig. 5.24 (annotated); Ex.1003, ¶171.

Thus, Chitrapu discloses transmitting a RACH/PRACH burst (*a signal*) before there is any application of timing advance (*when not time synchronized*). Ex.1003, ¶172.

It would have been obvious for Dateki's W-CDMA power control scheme to include the standardized UMTS random access procedures described by Chitrapu. Ex.1003, ¶173. Random access procedures are fundamental for establishing initial access to a W-CDMA network, to facilitate handovers between cells, and to save power when a mobile device did not have data to communicate. Ex.1008, 89, 90; Ex.1003, ¶173. The RACH protocol a well-known industry standard incorporated into UMTS, and would have been the expected behavior for the mobile station in

Dateki's UMTS-based communication and power control procedures. *See* §XI.E.1; Ex.1003, ¶173. Returning to the two signals and channels recited in claim 4, the combination is summarized in the table below. The mapped features from Dateki and Chitrapu are shown in parentheses. Accordingly, Chitrapu in view of Dateki renders obvious claim 4.

7. Claim 8

Claim 8 is a method claim corresponding to apparatus claim 4. Dateki and Chitrapu render claim 8 obvious for the same reasons described above with respect to claim 4. *See* §XI.E.6; Ex.1003, ¶174.

XII. DISCRETIONARY DENIAL IS INAPPROPRIATE

A. No basis for § 325(d) denial

The Grounds presented in this Petition have not previously been presented to the Office with respect to the Challenged Claims of the '889 patent. Although Dateki is listed on the face of the '889 patent, it was not relied upon during prosecution to reject the pending claims. Other than initialing an Information Disclosure Statement listing Dateki (*see* Ex.1002, 150), there is no evidence that the Examiner substantively considered Dateki with respect to the Challenged Claims. To the extent the Examiner considered Dateki with respect to the Challenged Claims, it was material error for the Examiner to have allowed the Challenged Claims for the reasons presented in the Grounds above. *Advanced*

Bionics, LLC v. Med-El Elektromedizinische Geräte GmbH, IPR2019-01469, Paper 6 at 8 (Feb. 13, 2020) (precedential).

B. No basis for *Fintiv* denial

The Board balances six factors in considering denial under § 314. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (Mar. 20, 2020) (precedential). These factors strongly favor institution. The district court case is in its very early stages. Patent Owner filed its complaint on April 12, 2024 (Ex.1017) and trial is not scheduled to start until May 14, 2026. Ex.1018 (scheduling order). Petitioner has worked diligently to prepare this Petition, which is being filed well within the one-year timeframe allowed by Congress.

1. No evidence regarding a stay

No motion to stay has been filed, so the Board should not infer the outcome of such a motion. *Sand Revolution II, LLC v. Continental Intermodal Group – Trucking LLC*, IPR2019-01393, Paper 24 at 7 (June 16, 2020) (informative). Thus, this factor is neutral on discretionary denial.

2. Parallel proceeding trial date

This factor weighs against discretionary denial because the projected trial date—based on median time-to-trial statistics—is in January of 2027³, which is well after the projected date for the Board to issue a Final Written Decision in May 2026. While trial is currently proposed⁴ for May 14, 2026 (Ex.1018, 4), the Board recognizes “that scheduled trial dates are unreliable and often change.” *See* Director’s Memorandum on Discretionary Denials (Ex.1020), 8. Moreover, Petitioner notes that “a court’s general ability to set a fast-paced schedule is not particularly relevant... where, like here, the forum itself has not historically resolved cases so quickly.” *In re Apple Inc.*, 979 F.3d 1332, 1344 (Fed. Cir. 2020). Thus, concerns over potentially conflicting decisions are minimal. As such, this factor heavily weighs against discretionary denial.

3. Investment in the parallel proceeding

The investment in the co-pending litigation has been minimal. A claim construction hearing has not yet occurred, fact discovery is not proposed to open until April 11, 2025, and expert discovery is not proposed to open until November

³ The current average time-to-trial for the district court hearing the co-pending litigation is 32.7 months. *See* Ex.1019, 5.

⁴ The district court has not entered an order scheduling a trial date.

20, 2025. Ex.1018, 2-3; *see PEAG LLC v. Varta Microbattery GmbH*, IPR2020-01214, Paper 8 at 17 (Jan. 6, 2021). This lack of investment favors institution.

Moreover, Petitioner only learned which claims were being asserted in August 2024. *See* Ex.1015 (infringement contentions cover pleading). Since then, Petitioner has worked expeditiously to file this petition within four months. And, as of this filing, Patent Owner has not yet served its final infringement contentions. Under *Fintiv*, Petitioner’s prompt filing “weigh[s] against exercising the authority to deny institution.” *Fintiv*, Paper 11 at 11.

4. Overlapping issues with the parallel proceeding

Petitioner served its preliminary invalidity contentions on October 24, 2024. However, Petitioner will not be serving its final invalidity contentions until May 22, 2025, well after the Board would issue an institution decision in this case. Ex.1018, 3. Accordingly, the extent of overlap is thus speculative at this point in time.

5. Petitioner is a defendant

Petitioner is a defendant in the co-pending litigation. That is true of most Petitioners in IPR proceedings, making this factor neutral. *See HP Inc. v. Slingshot Printing LLC*, IPR2020-01084, Paper 13 at 9 (Jan. 14, 2021).

6. Other circumstances

“[T]he PTAB will not deny institution of an IPR or PGR under *Fintiv* (i) when a petition presents compelling evidence of unpatentability.” Ex.1020, 9. Here, the petition—along with Dr. Kotzin’s expert testimony—plainly shows that the ’889 patent claims no more than well-known subject matter. In fact, the central aspects of the ’889 claims had already been adopted into wireless standards before the priority date of the ’889 patent. This compelling evidence of unpatentability renders the other *Fintiv* factors moot.

Because the *Fintiv* factors are either neutral or weigh against discretionary denial, institution should not be denied on discretionary factors.

C. No basis for *General Plastic* denial

The ’889 patent has not been challenged in any prior IPR petition, so *General Plastic* discretionary institution does not apply to this Petition. *See General Plastic Indus. Co., Ltd. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19 at 16 (Sept. 6, 2016) (Section II.B.4.i. precedential).

XIII. CONCLUSION

Petitioner has established a reasonable likelihood that the Challenged Claims are unpatentable.

Respectfully submitted,

Dated: November 25, 2024
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Scott T. Jarratt
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Registration No. 70,297

XIV. MANDATORY NOTICES

A. Real party-in-interest

Pursuant to 37 C.F.R. § 42.8(b)(1), Petitioner certifies that the real party-in-interest is Tesla, Inc.

B. Related matters

Pursuant to 37 C.F.R. § 42.8(b)(2), to the best knowledge of the Petitioner, the '889 patent is or was involved in the following cases:

Case Heading	Number	Court	Filed
<i>Intellectual Ventures II LLC v. Tesla, Inc</i>	<i>WDTX-1-24-cv-00390</i> (terminated)	WDTX	Apr. 11, 2024
<i>Intellectual Ventures II LLC v. Tesla, Inc.</i>	<i>WDTX-6-24-cv-00188</i> (pending)	WDTX	Apr. 12, 2024
<i>Intellectual Ventures II LLC v. Tesla, Inc.</i>	<i>WDTX-1-24-cv-00884</i> (transferred)	WDTX	Apr. 12, 2024

C. Lead and back-up counsel and service information

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Please address all correspondence in this proceeding to lead and back-up counsel. Petitioner consents to service in this proceeding by email at the addresses above.

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), Petitioner hereby certifies, in accordance with and reliance on the word count provided by the word-processing system used to prepare this Petition, that the number of words in this paper is 12,831. Pursuant to 37 C.F.R. § 42.24(d), this word count excludes the table of contents, table of authorities, mandatory notices under § 42.8, certificate of service, certificate of word count, appendix of exhibits, and any claim listing.

Dated: November 25, 2024

/Scott T. Jarratt/
Scott T. Jarratt
Lead Counsel for Petitioner
Registration No. 70,297

CERTIFICATE OF SERVICE

The undersigned certifies that, in accordance with 37 C.F.R. § 42.6(e) and 37 C.F.R. § 42.105, service was made on Patent Owner as detailed below.

Date of service November 25, 2024

Manner of service FEDERAL EXPRESS

Documents served Petition for *Inter Partes* Review Under 35 U.S.C. § 312 and 37 C.F.R. § 42.104 of U.S. 11,664,889;
Petitioner's Power of Attorney;
Petitioner's Exhibit List; and
Exhibits 1001-1015, 1017-1023, 1026-1028, 1031-1033 and 1035.

Persons served Volpe Koenig
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