

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,

Petitioner,

v.

INTELLECTUAL VENTURES II LLC,

Patent Owner.

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

**DECLARATION OF DR. GARY LOMP IN SUPPORT OF
PATENT OWNER'S RESPONSE**

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I, Dr. Gary Lomp, do hereby declare:

I. INTRODUCTION

1. I am making this declaration at the request of Intellectual Ventures II, LLC (“Intellectual Ventures”) in the matter of the *Inter Partes* Review (“IPR”) proceedings before the United States Patent and Trademark Office (“USPTO”) of U.S. Patent No. 11,664,889 (“the ‘889 Patent”) to provide expert technical opinions with respect to the ‘889 Patent.

2. I am being compensated for my work in this matter at my standard hourly rate of \$450 for such consulting services. My compensation in no way depends on the outcome of this case, and I have no financial interest in the outcome.

3. In preparing this Declaration, I considered the following materials, the subject matter of which are all within the scope of my education and professional experience:

- The ‘889 Patent, Ex. 1001;
- The Petition for *Inter Partes* Review of U.S. Patent No. 11,664,889 (“Pet.”);
- the Declaration of Dr. Kotzin;
- U.S. Patent No. 8,072,916 (Ex. 1005)(“Dateki”);
- U.S. Patent Publ. 2002/0141331 (Ex. 1009)(“Mate”);
- Prabhakar Chitrapu, et al., “Wideband TDD: WCDMA for the Unpaired Spectrum,” (2004) (Ex. 1008)
- the Institution Decision, and

- any other exhibits referred to in my Declaration.

II. PROFESSIONAL BACKGROUND

4. Based on my qualifications, education, knowledge, expertise, experience, and work background, I believe I am qualified to offer opinions relating to the technology described in the '889 Patent. Exhibit 2002 is a copy of my current *curriculum vitae* ("CV"), detailing my education and experience. Additionally, the following overview of my background pertains to my qualifications for providing expert testimony in this matter.

5. I am currently an Adjunct Professor in Wireless Communications at the NYU Tandon School of Engineering and President of TekTaktiks, a research and expert consulting company. My job duties include directing and performing research in, and technical evaluation of, advanced communication system design, especially new cellular technologies. I have over 45 years of experience in the field of wireless telecommunications, including advanced military communications systems, commercial satellite, WiFi and cellular systems research and development. I have over 20 years of experience in providing expert services in the field of wireless telecommunications. I hold Ph.D., Master's and Bachelor's degrees in Electrical Engineering, all from the Polytechnic Institute of New York (now part of NYU Tandon School of Engineering).

6. I am a named inventor on over 100 issued U.S. Patents in the field of wireless telecommunications. Most of these patents pertain to wireless communication, including communication system architecture, communication system signal processing and communication system protocols.

7. In addition to my technical experience in the field of wireless communications systems, I have been a principal and executive in multiple wireless technology corporations. In the late 1980s and early 1990s, I was Vice President and Chief Scientist at SCS Mobilecom, a wireless company that developed new technology based on spread spectrum technologies and advanced signal processing (DSP) techniques. Following the acquisition of SCS Mobilecom by InterDigital Communications, Corporation in 1992, I held various leadership roles at InterDigital, including General Manager of the Wireless Products Business Unit and Executive Vice President and Chief Technology Officer, where I helped develop 2G and 3G technologies. After InterDigital, I served in leadership positions at several wireless startups, including Symbol Technologies (where I led the Wide Area Wireless technology division), LayerOne Wireless Technologies Inc. (where I served as CEO) and incNetworks (where I served as CTO). I am also the Founder and President of The TekTacktics Group, Inc. a private company that has provided expert services and telecommunications consulting in the Telecommunications industry for the past 15 years.

8. In terms of commercial research and development (R&D) experience, I have worked extensively on the design and optimization of radio frequency (RF) communications systems for enhanced capacity and service coverage. A further object of my work has been to realize systems that are “converged” or are ingredients in a converged network concept. Convergence means the technical integration of heterogeneous services (such as voice, data, and multimedia) and heterogeneous radio technologies (macrocellular, microcellular, WiFi, cordless phone) into a seamless operating unit. This work requires cross functional design in which the respective heterogeneous technologies are made to interoperate.

9. During this career activity, I have had first-hand knowledge and exposure to numerous discussions, and debates in support of the advancement of new wireless technologies and paradigms. These new technologies addressed various air interface methods, including orthogonal frequency division multiplexing (OFDM) and Orthogonal Frequency Division Multiple Access (OFDMA), a closely related method of utilizing the OFDM format to provide shared access. My current research includes the presently evolving 5G cellular concept, which incorporates, among other things, MIMO-OFDM/OFDMA processing. As outlined above, my involvement in wireless R&D has also drawn me to fundamental system architecture issues and philosophies including the functional portioning of the overall wireless network. I have had the benefit of collaboration and debate with numerous top tier innovators,

from many industry-leading organizations in the field. In particular, I have detailed knowledge and recollection of the atmosphere surrounding the ongoing wireless technology revolution that began in the late 1980s and continues to the present day, including the period surrounding the present invention, and also including attempts by interested parties across the globe to promulgate and protect preferred ideas and intellectual property.

10. With respect to the technologies relevant to the '889 Patent, my experience includes over 20 years of research and development in the area of CDMA cellular telephone technology and systems, beginning at the very start of the commercialization of previously classified spread spectrum techniques, with which I had also a decade of prior experience. During that period of my career I had roles ranging from Senior Member of Technical Staff and Senior Principal Engineer to Chief Scientist and Chief Technology Officer heading a team of over 100 engineers in the development of the earliest WCDMA prototypes. I am a named inventor on 7 US Patents pertaining specifically to power control techniques in wireless systems, as well as many additional patents that cover all aspects of CDMA and post-CDMA wireless technology and systems. In addition to direct application to power control in cellular systems, in which numerous challenges and tradeoff analyses are required (as exemplified by the scope and depth of research and invention of concern in the current matter), I also had the benefit (earlier in my career) of 2 years of intensive study and

optimization of Delta Modulation for voice digitization, a project for which I was recognized for creating “the best 16 kilobit per second voice coder yet to be heard”. Many of the core issues that occur in power control of a wireless transmission over a randomly and often drastically varying radio channel are found in the application of delta modulation to voice encoding. An example is the well-known problem of choosing a step size and optimally varying the step size in order to cope with the dichotomous nature of the quantity being controlled (received radio frequency power level) or tracked (voice). In both applications, as dissimilar as they seem, the quantity of interest undergoes changes from near quiescence to rapid variation with large swings of level that challenge any algorithm attempting to stabilize or track said quantity.

11. To place the experience I have in the context of innovation and invention, I have been involved throughout my career in the evolution of many other basic radio communication technologies since their inception, such as MIMO, Multiuser Detection, and FEC coding advances, such as Turbo and LDPC, and soft output decoders such as the Soft Output Viterbi Algorithm (SOVA). A significant portion of the engineering design work I have performed has entailed the introduction of new techniques to provide capabilities that had not existed previously, such as a recently deployed novel baseband processor capable of robust demodulation and combining of signal components received on two antennas,

respectively, at very low signal to noise ratios. Most recently, I have designed an advanced form of OFDM in which the impairments of channel dispersion are mitigated in both the time domain (as in conventional OFDM) and the frequency domain (which is an Achilles heel of OFDM). This achievement is the result of many years of perseverance culminating in the discovery of a mathematical tool of broad applicability (to wit, Simultaneous Approximate Singular Value Decomposition). Previously, a similar tenacity-fueled accomplishment produced the first and only complete closed-form theory of equalization of offset modulation formats in multipath channels, again a result of a persistent creative attack on the problem. In a word, I am well versed and well aware of the nuances of innovation and the toils of invention.

12. My CV contains further details on my education, experience, publications, and other qualifications to render an expert opinion in this case. Ex. 2014.

III. RELEVANT LEGAL STANDARDS

13. I have been asked to provide my opinion as to whether certain claims of the '889 Patent are obvious over Dateki.

14. The opinions I am expressing in this report involve the application of my knowledge and experience to the evaluation of certain references with respect to the '889 patent. My formal knowledge of patent law is no different than that of any lay

person. Therefore, I have requested the attorneys from Volpe Koenig, who represent Intellectual Ventures, to provide me with guidance as to the applicable patent law in this matter. The paragraphs below express my understanding of how I must apply current principles related to patent validity to my analysis.

15. I understand that an IPR is a proceeding before the USPTO for evaluating the patentability of an issued patent's claims based on prior-art patents and printed publications.

16. I understand that the claims of a patent are reviewed from the point of view of a hypothetical person of ordinary skill in the art ("POSITA") at the time of the filing of the patent. The "art" is the field of technology to which a patent relates.

17. I understand that in determining whether a patent claim is anticipated or obvious in view of the prior art, the Patent Office must apply the *Phillips* standard to construe the claims.

18. I understand that, in this proceeding, Petitioners have the burden of proving that the challenged claims of the '889 Patent are unpatentable by a preponderance of the evidence. I understand that "preponderance of the evidence" means that a fact or conclusion is more likely true than not true.

19. I understand that there are two ways in which prior art may render a patent claim unpatentable. First, the prior art can "anticipate" the claim. Second, the prior art can render the claim "obvious" to a POSITA. I understand that for an

invention claimed in a patent to be patentable, it must not be anticipated and must not be obvious based on what was known before the invention was made. For purposes of this Declaration only, I have applied the definition of a POSITA proposed in the Petition.

20. I understand that a patent claim may be invalid as “anticipated” under 35 U.S.C. § 102 if each and every limitation of the claim as construed by the court is found, either expressly or inherently, in a single prior art reference, such as a publication or patent, that predates the claimed subject matter. I also understand that a patent claim may be invalid as obvious under 35 U.S.C. § 103 if the differences between the subject matter claimed and the prior art are such that the claimed subject matter as a whole would have been obvious to a POSITA at the time the invention was made. I also understand that several factual inquiries underlie a determination of obviousness. These inquiries include (1) the scope and content of the prior art, (2) the level of ordinary skill in the field of the invention, (3) the differences between the claimed invention and the prior art, and (4) any objective evidence of non-obviousness (i.e., “secondary considerations”).

21. I also understand that, when a party alleges obviousness based on a combination of references, that party should identify a reason why a POSITA would have been motivated to combine the asserted references in the manner recited in the

claims and to explain why a POSITA would have had a reasonable expectation of success in making such combinations.

22. I understand that an obviousness analysis permits the application of “common sense” in examining whether a claimed invention would have been obvious to a POSITA. For example, I understand that combining familiar elements according to known methods and in a predictable way may suggest obviousness when such a combination would yield nothing more than predictable results. And I understand a party asserting obviousness should still provide a specific motivation to combine the references as recited in the claims and explain why one would have reasonably expected to succeed in doing so.

23. I understand that one indicator of non-obviousness is when a prior art reference leads in a different direction or discourages that combination, recommends steps that would not likely lead to the patent’s result, or otherwise indicates that a seemingly inoperative device would be produced.

IV. SPECIFICATION OF ‘889 PATENT

A. Background of the ‘889 Patent

24. The ‘889 Patent pertains to uplink power control in time division-code division multiple access (TD-CDMA) systems. The ‘889 Patent describes an improved technique for uplink power control in such systems, particularly in scenarios where channel reciprocity—the condition that enables a mobile device to

infer uplink channel conditions from downlink observations—cannot be guaranteed. Departing from conventional approaches that required the establishment of a dedicated feedback channel, the ‘889 Patent introduces a shared, closed-loop feedback mechanism in which mobile devices transmit uplink beacon signals (UL_Beacons), and the base station responds with power control information via a shared Physical Layer Control Channel (PLCCH) that shares a time slot with a downlink shared channel.

1. Power Control In TD-CDMA Systems

25. Power control is critical in TD-CDMA systems to maintain communication quality, minimize interference, and optimize network capacity. Since TD-CDMA systems allow messages for multiple users to be transmitted simultaneously over the same frequency band, effective power control is essential to ensure that signals remain distinguishable and interference is minimized. TD-CDMA systems are highly susceptible to the near-far effect — a situation where signals from nearby users overpower those from distant users, potentially drowning them out. Power control techniques are needed to ensure that users transmitting too strongly reduce their power to avoid overwhelming others, and that users far from the base station increase their power to ensure their signal is detectable.

26. In “open-loop” power control, a mobile station increases or decreases its transmission power based on the received signal strength at the mobile station. In

“closed-loop” power control, the base station monitors the quality of the signal received from the mobile station, and based on this information, the base station sends feedback information to the mobile station, which the mobile station uses to increase or decrease its transmission power.

2. Use Of Channel Reciprocity For Open-Loop Power Control In TD-CDMA Systems

27. The Background of the ‘889 Patent begins by discussing the use of channel reciprocity to provide “open-loop” power control in such systems. As discussed in the ‘889 Patent, when channel reciprocity exists, a mobile station can derive information for implementing power control on the uplink channel conditions from downlink channel conditions:

Time division-code division multiple access (TD-CDMA) is an air interface technology that combines the benefits of the three elemental concepts in a universal mobile telecommunication system (UMTS): time division multiple access (TDMA); code division multiple access (CDMA); and time division duplex (TDD). TDD, in particular, uses the same radio channel for both uplink and downlink communications, ... One of the benefits obtained by operating both links on the same frequency is the ability to exploit channel reciprocity.

Channel reciprocity gives equipment the ability to derive information about uplink channel conditions from downlink channel conditions based upon signals received by the user equipment (UE). Pathloss is one example of channel information that can be obtained from channel reciprocity. Knowledge of the uplink pathloss enables open-loop power control to be employed for uplink transmissions. For example, uplink power control is important for the operation of the CDMA element of TD-CDMA as it counteracts the near-far effect that would otherwise be encountered if all UEs transmitted at a fixed power regardless of the uplink pathloss. ... EX1001, 1:27-49.

28. After explaining the concept of channel reciprocity, the ‘889 Patent emphasized that a UE that “can derive information needed to access uplink channels from the downlink transmissions (beacon signals) has a significant advantage over a terminal that relies on the (lengthy) configuration of a dedicated channel in order to establish a feedback channel.” *Id.*, 1:57-61.

3. Channel Reciprocity Cannot Be Guaranteed When Uplink And Downlink Transmissions Exceed The Coherence Bandwidth Or Coherence Time Of The Channel

29. The ‘889 Patent next explained that there are situations where “channel reciprocity cannot always be guaranteed” because correlation between the uplink and downlink transmissions is lost. *Id.*, 1:62-63. For example, there are situations where “the correlation between uplink and downlink channels is lost because the channels are transported on carrier frequencies that are separated in frequency by an amount that is greater than the coherence bandwidth¹ of the channel.” *Id.*, 1:67-2:3. In addition to situations where the coherence bandwidth is exceeded, the ‘889 Patent recognized that “the time delay between downlink and uplink transmissions may exceed the coherence time of the channel.” *Id.*, 2:7-9. As a general rule, correlation

¹ Coherence bandwidth defines the frequency range where wireless channel conditions are similar, and it is inversely related to the delay spread. The smaller the coherence bandwidth, the harder it becomes for a UE and a base station to effectively align signals.

between the uplink and downlink transmissions (required for channel reciprocity) is adversely affected and transmission errors increase when the coherence bandwidth and/or coherence time of the channel are exceeded.

30. The Background of the '889 Patent concluded by identifying the need for a substitute for channel reciprocity when “the TD-CDMA air interface is to be used in applications where the correlation between the uplink and downlink path loss is not guaranteed.” *Id.*, 2:17-20; *see also*, 2:24-28 (“known conventional methods do not deal directly with the evolution or adaptation of an air interface that uses channel reciprocity to deliver key features and advantages where channel reciprocity is not guaranteed”).

B. Brief Summary Of The Invention

31. The Brief Summary of the Invention began by explaining the goal of providing uplink channel control in environments where channel reciprocity cannot be guaranteed:

Although it is desirable to support air interfaces where the pathloss is not reciprocal, known conventional methods do not deal directly with the evolution or adaptation of an air interface that uses channel reciprocity to deliver key features and advantages where channel reciprocity is not guaranteed. The adaptation provided in embodiments of the invention introduces a new technique for uplink channel control that uses a feedback scheme as a substitute for the absence of channel reciprocity, with minimal impact on the ability of the air interface to support uplink shared channels. *Id.*, 2:24-33 (emphasis added).

32. Next, the Brief Summary of the Invention provided a high-level overview of embodiments of the invention:

Embodiments of the present invention enable active feedback control between a base station and user equipment (UE). In particular, the operation of a system designed for TDD, or unpaired operation, is expanded to operate in FDD, or paired, mode. For example, an uplink beacon function (for power control) and a modified random access process substitute for the information lost due to the lack of channel reciprocity in paired operation. ... In one embodiment, a UE allocates a time slot for a beacon signal separated from the time slots for data in a frame. A second time slot is allocated within the frame for the base station to transmit a control signal in response to the beacon signal. The control signal instructs the UE to adjust a transmission parameter.

A UL_Beacon signal may be combined with a physical layer common control channel (PLCCH) to form a feedback system. ... The PLCCH carries feedback information to the UEs that are transmitting UL_Beacon signals. The PLCCH can share a timeslot with other physical channels by exploiting the CDMA aspect of the system. *Id.*, 2:34-64 (emphasis added).

33. Thus, as described in the Brief Summary, the disclosed solution included an uplink beacon function in combination with a modified random access process. Mobile stations (or UEs) transmit UL_Beacon signals to the base station. The base station then uses a physical layer common control channel (or PLCCH) to carry feedback information from the base station to the UEs (i.e., on the downlink). The Brief Summary also explains that the PLCCH can share a timeslot with other physical channels by exploiting the CDMA aspect of the system, meaning that the PLCCH and other physical channels could be transmitted at the same time using different spreading codes.

C. Detailed Description of the ‘889 Patent

1. Implementation Of Closed-Loop Power Control With An Uplink Physical Layer Common Control Channel (PLCCH) That Shares A Timeslot With A Downlink Shared Channel

34. The ‘889 Patent describes “the combination of an uplink physical channel control signal with a downlink feedback channel” in order “to keep the terminal informed of the condition of the uplink channel.” *Id.*, 4:56-59. The ‘889 Patent refers to the uplink physical control signal as an “Uplink Beacon” (UL_Beacon), and discloses the use of a physical layer common control channel (or PLCCH) to carry the feedback information from the base station to the UEs on the downlink. *Id.*, 2:52-62 and 4:59-61. In one embodiment, “the physical channel control signal is separate from the uplink (shared) physical channel. Thus, terminals are able to transmit an UL_Beacon independently of their access to the uplink shared channel.” *Id.*, 5:5-8. This embodiment implements “a closed loop control system, in which the base station detects the received power and/or other channel information from the UL_Beacon, and sends controlling commands back to each terminal to keep the terminal informed of the channel conditions observed at the base station.” *Id.*, 5:8-14.

35. The ‘889 Patent also discloses that the PLCCH can share a timeslot with another downlink shared channel. In this arrangement, a single timeslot is shared by two shared channels, e.g., the PLCCH (which is itself a shared channel)

shares the same timeslot with another shared channel, and information in the PLCCH is used by the mobile station to effectuate power control. This arrangement is shown in Figure 2 of the '889 Patent, reproduced below with annotations:

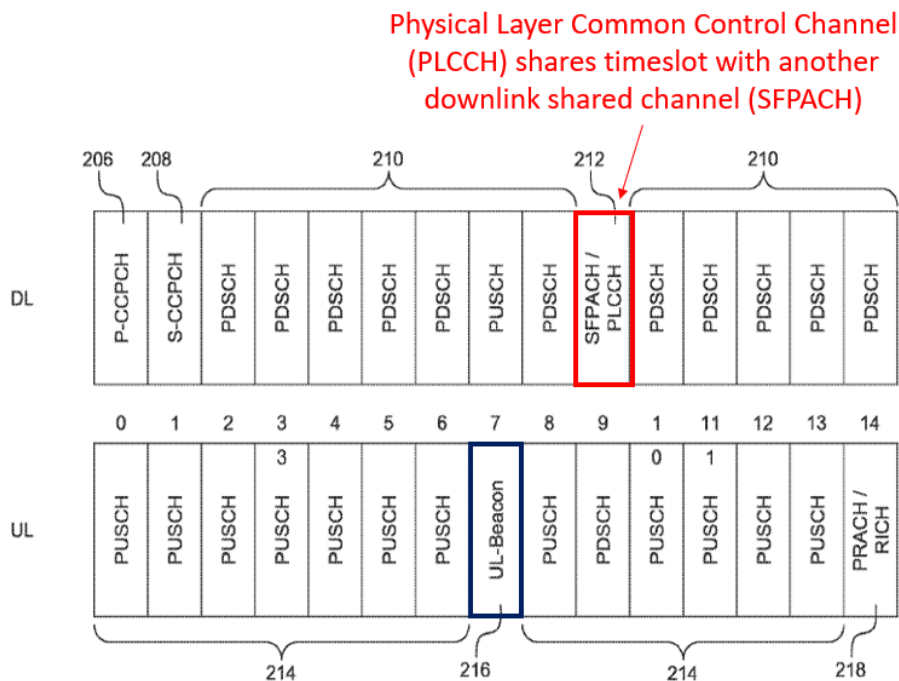


FIG. 2

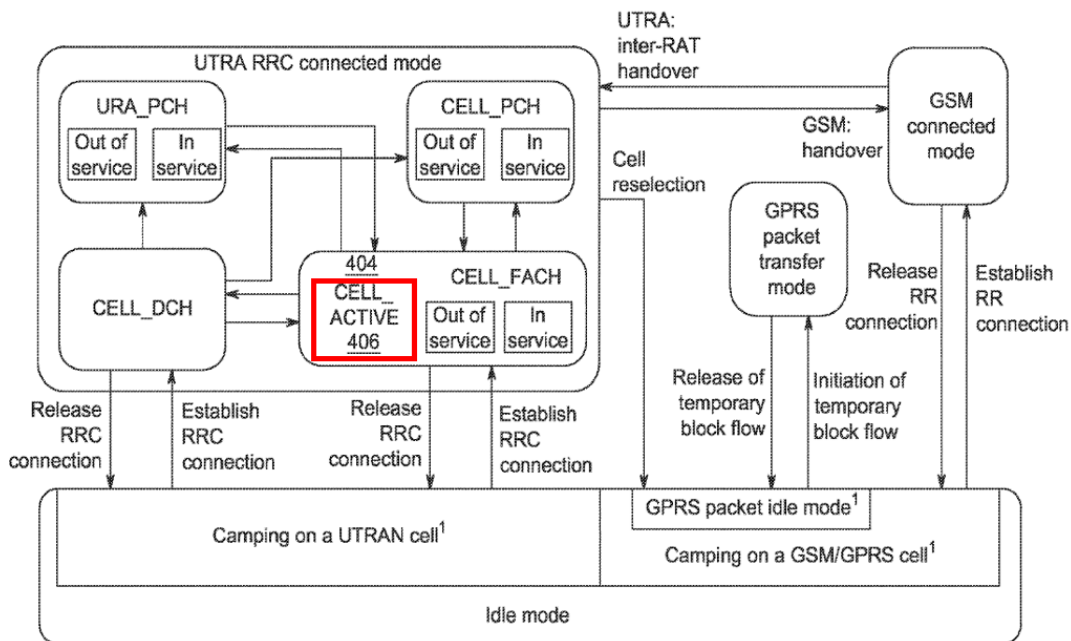
36. “FIG. 2 illustrates an example of a timeslot arrangement supporting the UL_Beacon [blue box] and its corresponding PLCCH [red box] within a TD-CDMA frame structure.” EX1001, 6:5-7. Figure 2 depicts downlink and uplink frames of a TD-CDMA system operating in a Frequency Division Duplex (FDD) mode, where a downlink frame (labelled “DL” above) and an uplink frame (labelled “UL” above) are transmitted at the same time on different frequencies, such that the base station and mobile station transmit and receive at the same time. *Id.*, 4:25-31 and 6:8. In this arrangement, “[t]he PLCCH 212 shares a timeslot with another downlink shared

channel” which “is possible since *normal downlink physical channels are used to transmit the PLCCCH.*” *Id.*, 6:8-11 (emphasis added). In Figure 2, the normal downlink physical channels include “normal traffic carrying timeslots 210.” *Id.*, 6:11-13. “The uplink frame comprises a UL_Beacon control timeslot 216, an access control timeslot 218, and normal traffic carrying timeslots 214.” *Id.*, 6:11-13.

2. Cell_Active Substate That UEs Leave When Downlink Synchronization Is Deemed Lost Due To High Downlink Errors Or Low Signal Strength

37. The ‘889 Patent recognized that the number of users that can be supported with active control feedback channels will generally be smaller than the typical number of users per cell. EX1001, 6:66-7:2. As a result, the specification disclosed a technique for managing UEs in this active state based on a novel sub-state that the specification referred to as the “CELL_ACTIVE” sub-state. *Id.*, 7:3-16. The “CELL_ACTIVE” sub-state identifies a UE that “transmits the physical control channel part of the uplink physical channel only, and nothing else (i.e., no data.)” *Id.*, 7:11-16. While then existing UMTS systems supported several “RRC-Connected states” including the “CELL_DCH” and “CELL_FACH” states, “CELL_ACTIVE” was a new sub-state of the “CELL_FACH” state not described in the UMTS standard. *Id.*, 7:6-13.

38. Figure 4 of the '889 Patent (reproduced below with red annotation added by Patent Owner) illustrates the new “CELL_ACTIVE” sub-state [red box] in context with other UTRA RRC-connected states:



39. “As shown in FIG. 4, CELL_ACTIVE sub-state is a sub-state of CELL_FACH state 404.” *Id.*, 7:17-18. “Out of the population of UEs in CELL_FACH state 404, a smaller number of UEs, determined by the network to be the most-active UEs, are supported in a CELL_ACTIVE state 406. In this state, the UEs transmit the physical channel control signal and listen to the associated feedback channel from the network.” *Id.*, 7:20-23 (emphasis added). “Because the UE is aware of the uplink pathloss conditions from the feedback channel, it can have

instant access to the uplink shared channels, and the resource allocator (controller) in the network can treat the UE accordingly.” *Id.*, 7:26-29.

40. As the ‘889 Patent explains, UEs in the CELL_ACTIVE state automatically come out of the CELL_ACTIVE state when, for example, high downlink errors or low received signal strength indicates that the downlink is out-of-synchronization:

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). This feature prevents UEs continuing to transmit in a state where the feedback channel may be unreliable and thus causing interference. *Id.*, 7:38-45 (emphasis added).

V. PROSECUTION HISTORY OF THE ‘889 PATENT

A. The Disclosure Of Dateki -- The Sole Reference Relied On To Challenge The Independent Claims Of The ‘889 Patent -- Was Presented To And Considered By The Examiner Over A Dozen Times

41. The European Counterpart (EP 1 681 780)(EX2005) to Dateki (EX1005) was the primary reference (D1) applied against the claims in the PCT counterpart (PCT/EP2007/064483) of the disclosure corresponding to the ‘889 Patent:

- 1 Reference is made to the following documents, which are cited in the International Search Report:

D1: EP-A-1 681 780 (FUJITSU LTD [JP]) 19 July 2006 (2006-07-19)

D2: US 2006/093026 A1 (MONTJOJO JUAN [US] ET AL) 4 May 2006 (2006-05-04)

D3: DE 102 01 270 A1 (SAMSUNG ELECTRONICS CO LTD [KR]) 8 August 2002 (2002-08-08)

- 2.2 Accordingly all features of independent Claim 1 are known from D1 and its claimed subject-matter is thus not novel within the meaning of Article 33(2) PCT.

EX2006, at 297-298.

42. In response to the Written Opinion, the Applicant presented the Office with a copy of EP 1 681 780 (Dateki), and copies of the International Search Report and Written Opinion citing the same in U.S. Appl. 11/646,692 -- the first application in the chain of priority of the '889 Patent. EX2006, at 269-285, 288-293, 294-302, 305-306, 309-311, and 148. Examiner Abselson (a Primary Examiner) signed the IDS indicating that he had considered these submissions. EX2006, at 132.

43. The Applicant again disclosed all of the same information in Application No. 13/176,298 -- the next application in the priority chain. EX2007, 86-89 (Foreign Patent Document Cite No. 4 and NPL Cite No. 9); 236-252, 403-405. Examiner Abselson again signed the IDS indicating that he had considered these submissions. EX2007, at 1851-1852 and 1857-1860.

44. Also, during prosecution of Application No. 13/176,298, the Applicant brought to the attention of Examiner Abelson that the Japanese Counterpart of Dateki (JP 2006-1973318) had been cited against Applicant's Japanese counterpart. EX2007, at 1943-1959 and 1911-1912. At the same time, the Applicant indicated that the U.S. version of Dateki (USP 8072916, EX1005) corresponded to the Japanese counterpart of Dateki raised by the Japanese Patent Office:

U.S. PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
	1	6611509	BA	2003-08-26	Hayashi et al.	* Corresponds to JP 11-261544
	2	8072916	BB	2011-12-06	Dateki	* Corresponds to JP 2006-197318

* * *

FOREIGN PATENT DOCUMENTS								Remove
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ² j	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1	11-261544	JP		1999-09-24	Hayashi et al.		☐
	2	2006-197318	JP		2011-12-06	Dateki		☐

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NON-PATENT LITERATURE DOCUMENTS					Remove
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.			T ⁵
	1	OFFICE ACTION, Japanese Patent Application No. 2009-543459, dated December 18, 2012.			☐

EX2007, at 1911-1912. Examiner Abselson again signed the IDS indicating that he had considered these submissions. EX2007, at 1851-1852.

45. The Applicant again disclosed multiple versions of Dateki in Application No. 14/458,693 -- the next application in the priority chain. EX2008, 578-583 (U.S. Patent Cite No. 11; Foreign Patent Cite No. 4; and Non-Patent Literature Cite No. 12). Examiner Abselson again signed the Information Disclosure Statements indicating that he had considered these submissions. EX2008, at 526-532 and 552-558.

46. The Applicant again disclosed multiple versions of Dateki in Application No. 16/682,854 -- the next application in the priority chain. EX2009, at 198-207 (U.S. Patent Cite No. 11; Foreign Patent Cite No. 4; and Non-Patent Literature Cite No. 12). Examiner Abselson again signed the IDS indicating that he had considered these submissions. EX2009, at 186-195.

47. The Applicant again disclosed multiple versions of Dateki in Application No. 17/339,550 -- the next application in the priority chain. EX2010, at 53-62 (U.S. Patent Cite No. 11; Foreign Patent Cite No. 4; and Non-Patent Literature Cite No. 12). Examiner Abselson again signed the IDS indicating that he had considered these submissions. EX2010, at 24-33.

48. The Applicant again disclosed multiple versions of Dateki in Application No. 17/583,369 -- the next application in the priority chain. EX2011, at

34-39. Examiner Abselson again initialed the pages of the IDS indicating that he had considered these submissions. EX2011, at 27-32.

49. The Applicant again disclosed multiple versions of Dateki in Application No. 17/870,425 (the last application in the chain), which matured into the ‘889 Patent. EX2012, 47-52. Examiner Abselson again initialed the pages of the IDS indicating that he had considered these submissions. EX2012, at 26-31.

50. Thus, Examiner Abselson was specifically directed to the pertinence of Dateki’s disclosure and, on at least seven separate occasions, he indicated that he considered these materials. Moreover, over the course of 13 years (from 2009-2022), the Applicant directed Examiner Abselson to Dateki at least 14 times by citing either the U.S., European, or Japanese version of Dateki in Information Disclosure Statements. In every case, Examiner Abselson indicated that he considered the submissions.

B. The Written Opinion Of The PCT Authority Specifically Directed The Examiner To Dateki, And The Petition Maps Dateki In A Manner Similar To The Mapping Of The PCT Authority

51. The European counterpart of Dateki -- referred to as “D1” below -- was the primary basis for the rejection of the claims in the PCT counterpart of the disclosure corresponding to the ‘889 Patent. Just like the arguments made in the Petition, the PCT Authority based its rejection on Figure 6 of Dateki, including the

transmission power control (TPC) information in a time slot on Dateki's F-DPCH channel, as shown in Figure 6:

Document D1, which is considered to represent the closest state of the art, discloses a method for enabling active control feedback between a base station and mobile station in a wireless communications network (see D1, paragraphs 20, 23), the method comprising:

- allocating a first time slot within a frame for a mobile station to transmit a beacon signal to the base station, wherein the beacon signal is separate from data signals in the frame (see D1, paragraphs 10, 11, 50, 55, 56, figure 6, the periodically sent uplink pilot transmission at the period assigned to TPC in the F-DPCH, in a slot preceding the slot assigned to the F-DPCH, the pilot being sent without accompanying data, the frame length being 10 ms, a subframe comprising 3 slots);
- allocating a second time slot within the frame for the base station to transmit a control signal in response to the beacon signal, the control signal for providing a basis upon which the mobile station adjusts a transmission parameter (see D1, paragraphs 47, 52, 56, figure 6, the slots in the F-DPCH carrying the TPC bits used for uplink power control) ... EX2006, at 297 (emphasis added).

52. Similar to the analysis of the PCT Authority, the Petition maps “a control message [transmitted] over a physical control channel in a first time slot,” as recited in claims 1 and 5 of the ‘889 Patent, to the transmission of TPC bits on Dateki’s F-DPCH channel in Figure 6 of the reference. Petition, 30-32.

53. Moreover, similar to the analysis of the PCT Authority, the Petition maps the requirements that the UE “extract power control information ... from the first message” and “transmit a signal ... based on the extracted control information” as recited in claims 1 and 5 of the ‘889 Patent to information extracted from the TPC commands sent on the F-DPCH channel in Figure 6 of Dateki. Petition, 39-41.

54. Thus, much like the Petition, the PCT Authority attempted to map Figure 6 of Dateki to the disclosure of the ‘889 Patent. Examiner Abelson was directed to this analysis and considered it on multiple occasions, correctly finding it lacking.

C. The ‘425 Application - The Final Application In The Priority Chain

55. The ‘889 Patent is based on U.S. Patent Appl. No. 17/870,425 (the ‘425 Application). As originally filed, the ‘425 Application included 20 claims. Original claim 1 recited:

1. A first user equipment (UE) comprising:
a transmitter;
a receiver; and
a processor, operatively coupled to the transmitter and the receiver,
wherein:
the receiver and the processor are configured to receive a control message over a physical control channel in a first time slot, wherein the control message has power control bits for a plurality of UEs, wherein the plurality of UEs include the first UE,
the processor is further configured to extract power control 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. EX1002, 28.

56. Original claim 1 was supported by the embodiments of the ‘889 Patent discussed above where a PLCCH (“a control message”) with power control bits for a plurality of UEs (“the control message has power control bits for a plurality of UEs”) is used by a UE to recover the control message and extract the power control

bit relevant to such UE (the processor in the UE “is further configured to extract power control information for the first UE from the control message.”) Based on the extracted power bits, the UE transmits “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.” In the disclosed embodiment discussed above, this signal transmitted by the UE over the physical control channel to the base station corresponds to the UL_Beacon.

57. In the first Office Action, the Examiner rejected claim 1 as obvious over Anderson and Liang. *See*, EX1002, 58-60. However, the first Office Action indicated that dependent claim 2 would be allowable if re-written in independent form. EX1002, 60. Claim 2 depended from claim 1, and added the additional requirement that “the first time slot also includes a downlink shared channel.” *Id.*, 28. Thus, claim 2 added the additional requirement that a single timeslot is shared by the physical control channel with power control bits for a plurality of UEs (e.g., the PLCCH) and another downlink shared channel, and information transmitted over the physical control (i.e., a control message with power control bits for a plurality of UEs) is used by the mobile station to effectuate power control.

58. In response to the First Office Action, the Applicant amended independent claim 1 to further recite “wherein the first timeslot also includes a downlink shared channel.” Thus, the claim was amended to require a single timeslot

shared by a physical control channel with power control bits for a plurality of UEs and another downlink shared channel. EX1002, 126. The Applicant inserted similar limitations into the other independent claims.

59. In the next Office Action, the Examiner issued a Notice of Allowance. EX1002, 137-141. Based on the prosecution history, it is clear that, from the Examiner's perspective, the point of novelty of the independent claims of the '889 Patent was the requirement that a single timeslot is shared by a physical control channel with power control bits for a plurality of UEs and another downlink shared channel, and information transmitted over the physical control (i.e., a control message with power control bits for a plurality of UEs) is used by the mobile station to effectuate power control. As explained later, the primary reference relied on in the Petition (Dateki) lacks this aspect of the Challenged Claims.

VI. CHALLENGED CLAIMS OF THE '889 PATENT

60. Petitioner challenges claims 1-8 of the '889 Patent, of which claims 1 and 5 are independent.

A. Independent Claims 1 And 5

61. Independent Claim 1 recites:

1. A first user equipment (UE) comprising:
a transmitter;
a receiver; and
a processor, operatively coupled to the transmitter and the receiver,
wherein:

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

the processor is further configured to extract power control 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.

62. Claim 1 recites a first UE having a combination of interrelated limitations, several of which are emphasized above. More specifically, the claim recites (i) “a control message” that “has power control bits for a plurality of UEs” that “include the first UE,” (ii) the control message is transmitted in a time slot that “also includes a downlink shared channel,” and (iii) the UE transmits a signal over a physical control channel to the base station based on power control information extracted from the control message that was transmitted in the timeslot that included the downlink shared channel. To be clear, the language in independent claim 1 requires all three of these limitations to be practiced in combination. Independent claim 5 includes substantially similar limitations.

B. Dependent Claims 3 And 7

63. Dependent claim 3 further recites:

3. 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 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.

64. Dependent claim 3 corresponds, for example, to the aspect of Figure 2 (reproduced below with colored annotations added) of the ‘889 Patent where “the signal [transmitted by the first UE] over the physical channel” corresponds to the UL-Beacon [red box] which is transmitted in one timeslot and the transmission of “data over a physical channel” corresponds to the data traffic transmitted over the PUSCH [blue boxes]:



65. In the language of dependent claim 3, Figure 2 depicts an example where the UE does “not transmit the signal over the physical channel [the UL-Beacon in the red box] at a same time that data over a physical shared channel [the data traffic transmitted using the PUSCH in the blue boxes] is transmitted.” Dependent claim 7 includes substantially identical limitations as in dependent claim 3.

C. Dependent Claims 4 And 8

66. Dependent claim 4 further recites:

4. 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.

67. Dependent claim 4 corresponds, for example, to an implementation of the technique disclosed in the specification for managing UEs in CELL_FACH based on the new sub-state referred to in the specification as the “CELL_ACTIVE” sub-state. Ex. 1001, 7:3-16. “Out of the population of UEs in CELL_FACH state 404, a smaller number of UEs, determined by the network to be the most-active UEs, are supported in a CELL_ACTIVE state 406.” *Id.*, 7:20-23. As the ‘889 Patent explains, UEs in the CELL_ACTIVE state automatically come out of the CELL_ACTIVE state when, for example, high downlink errors or low received signal strength indicates that the downlink is out-of-synchronization:

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). This feature prevents UEs continuing to transmit in a state where the feedback channel may be unreliable and thus causing interference. *Id.*, 7:38-45 (emphasis added).

68. Thus, in the language of claim 4, when an active UE remains “time synchronized” (resulting in the UE remaining in the CELL_ACTIVE sub-state), the

UE “transmit[s] the signal [e.g., UL-Beacon] over the physical control channel; however, when the active UE detects that it is no longer “time synchronized” (and automatically comes out of the CELL_ACTIVE sub-state) the UE “transmit[s] a signal over a random access channel.” Dependent claim 8 includes substantially identical limitations as in dependent claim 4.

VII. CLAIM CONSTRUCTION

A. “extract power control information ... from the control message, and ... transmit a signal ... to a base station ... at a transmission power level based on the extracted power control information” (claims 1 and 5)

69. Claim 1 recites a control message that “has *power control bits for a plurality of UEs*.” Claim 1 further recites that the first UE is configured to “*extract power control information ... from the control message*, and ... transmit a signal ... to a base station ... at a transmission power level *based on the extracted power control information*.” Claim 5 recites similar limitations. This claim language requires that “*the* extracted power control information” upon which the UE bases its transmission of a signal be the *same* power control information extracted from *the control message* (singular) having *power control bits for a plurality of UEs*. Simply put, the claim language would *not* be met if “*the* extracted power control information” used for transmitting the signal came from a control message that had power control bits for *only a single UE*. EX2013, ¶48.

B. “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” (claims 4 and 8)

70. Dependent claim 4 requires that the first UE be configured to make a binary choice depending on whether or not the “time synchronized” condition is met. When there is time synchronization, the UE must “transmit the signal over the physical control channel; and when there is not time synchronization, the UE must “transmit a signal over a random access channel.” Among other requirements, this claim language requires that a UE coming out of a “time synchronized” state such that the UE is “not time synchronized” transition from transmitting “the signal over the physical control channel” to transmitting “a signal over a random access channel.” Put another way, the claim language would not be met by a UE that continued transmitting “the signal over the physical control channel” when there was “not time synchronization.” See, e.g., EX1001, 7:38-45 (“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). This feature prevents UEs continuing to transmit in a state where the feedback channel may be unreliable and thus causing interference”).

VIII. REFERENCES RELIED ON IN PETITION

71. The Petition advances three Grounds. Ground 1 asserts that independent claims 1 and 5, and dependent claims 2 and 6, are obvious over Dateki (EX1005) alone. Ground 2 asserts that dependent claims 3 and 7 are obvious over Dateki in view of Mate (EX1009), and Ground 3 asserts that dependent claims 4 and 8 are obvious Dateki in view of Chitrapu (EX1008).

A. Dateki

72. As its sole reference for Ground 1, the Petition relies on Dateki. Dateki relates to a wireless communication apparatus for “controlling transmission power according to transmission power control information.” EX1005, 1:10-13. The Petition (at 3-43) relies exclusively on Figure 6 of Dateki for Elements [1.2] - [1.6]; accordingly, the overview of Dateki presented below therefore focuses on the disclosure associated with that figure.

1. Operation Of Downlink Channels On Figure 6 Of Dateki

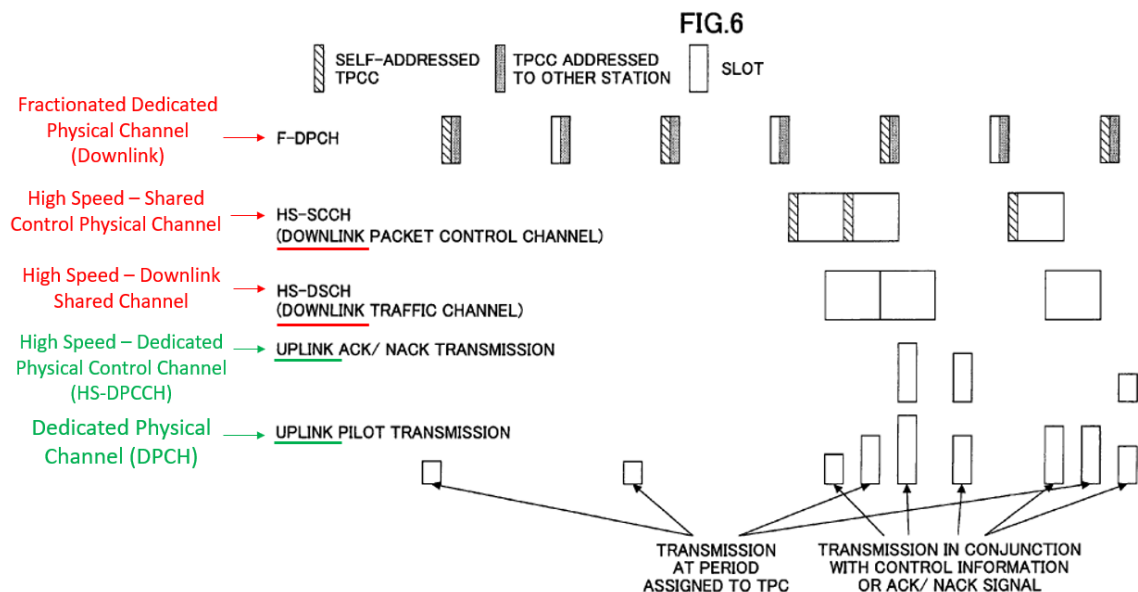
73. Figure 6 of Dateki (reproduced below with Patent Owner’s annotations in color) is “a diagram illustrating a transmission power control operation according to a second embodiment” of Dateki. *Id.*, 7:44-46. The top three channels on the figure (labelled in red) correspond to downlink channels (carrying transmissions from a base station to a UE), and the bottom two channels (labelled in green) correspond to uplink channels (carrying transmissions from a UE to a base station).

Physical Channel.” *Id.*, 12:4-5. “The HS-SCCH corresponds to a control channel for transmitting parameter information” pertaining to data transmitted to a particular UE on the High Speed - Downlink Shared Channel. *Id.*, 2:27-29 (emphasis added). As shown in Figure 6, the beginning of each frame on the HS-SCCH carries power control information (denoted in the figure as “Self-Addressed TPCC”) which is addressed to the specific UE that is the intended recipient of data traffic on the High Speed - Downlink Shared Channel that is sent just after the start of the HS-SCCH frame. It bears emphasis that the power control information transmitted to a UE on the HS-SCCH is not intended for a plurality of UEs -- but rather only for the specific UE to which data is to be transmitted on the High Speed - Downlink Shared Channel.

76. As shown by the purple markings in annotated version of Figure 6 above, the start of each frame of data traffic on the High Speed - Downlink Shared Channel is delayed by two slots from the start of the previous HS-SCCH frame “so that the mobile station may receive and identify information pertaining to demodulation” of the High Speed Downlink Shared Channel before the receipt of a frame with data traffic on that channel. EX1005, 3:8-12.

2. Operation Of Uplink Channels On Figure 6 Of Dateki

77. The bottom two channels (labelled in green) in the annotated version of Figure 6 (reproduced again below) correspond to uplink channels (carrying transmissions from the “self addressed” UE to a base station).



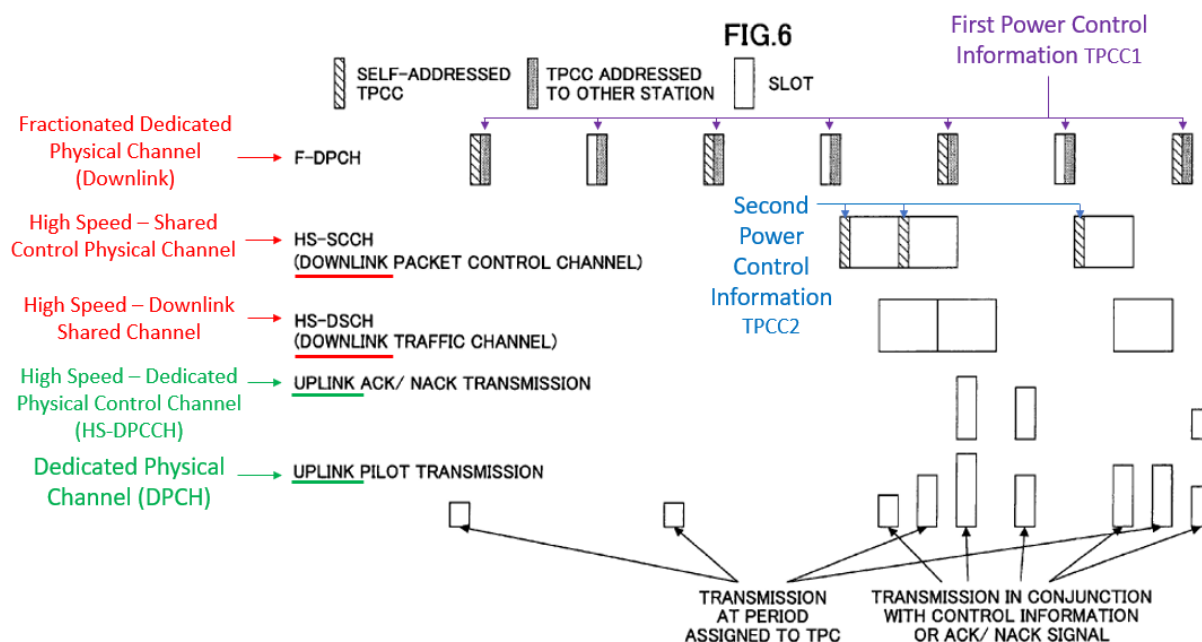
78. The channel labelled “UPLINK ACK/NACK TRANSMISSION” (in green in diagram above) corresponds to a High Speed - Dedicated Physical Control Channel (also referred to as the HS-DPCCH) used by the UE to send acknowledgment messages to the base station indicating whether or not data traffic sent from the base station to the mobile on the High Speed - Downlink Shared Channel was properly received. EX1005, 12:3-32. “The HS-DPCCH ... 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.” *Id.*, 2:35-40.

79. The bottom channel labelled “UPLINK PILOT TRANSMISSION” (in green in diagram above) corresponds to a Dedicated Physical Channel (or a DPCH).

EX1005, 12:8-10. The DPCH (uplink) is used by the UE to transmit a pilot signal to the base station.

3. Dateki's Disclosure Of First Transmission Power Control Information (TPCC1) And Second Power Control Information (TPCC2)

80. Dateki explains that the “base station receives a pilot signal, conducts SIR estimation on the pilot signal ... , generates transmission power control information TPCC ... , and transmits the transmission power control information TPCC” via the *F-DPCH* as *first transmission power control information TPCC*.” EX1005, 13:1-8 (emphasis added). The *first* transmission power control information (labelled in purple on the diagram below) corresponds to the individually addressed TPCC messages sent from the base station to mobile station on the F-DPCH. EX1005. Dateki also refers to the *first* transmission power control information as TPCC1. EX1005, 13:50-52. The periodic interval between transmissions of the first transmission power control information (TPCC1) to a given mobile station on the F-DPCH (i.e., indicated as “self-addressed TPCC”) is “*relatively long*.” EX1005, 13:4-8 (emphasis added).



81. In addition to transmitting the first transmission power control information (TPCC1) to the mobile station on the F-DPCH at “relatively long” intervals, *when the base to station is sending data traffic* to the mobile station over the HS-PDSCH, the base station transmits second transmission power control information (TPCC2) (labelled in blue in the diagram above) to the mobile station on the HS-SCCH “at a shorter period cycle.” EX1005, 13:8-11 (“*where packet transmission is conducted*, the transmission power control information is transmitted via the HS-SCCH as second transmission power control information”), 13:50-54. In addition to having a shorter period cycle, “the second transmission power control information TPCC2 is arranged to be greater than the first transmission power control information TPCC1 (TPCC1<TPCC2).” EX1005, 13:54-57. The

combination of (i) the shorter period cycle for transmission of the second transmission power control information (TPCC2), and (ii) the greater magnitude associated with the second transmission power control information (TPCC2), allows the second transmission power control information TPCC2 sent on the HS-SCCH *“to swiftly control the transmission power to a desired level” when the base to station is sending data traffic* to the mobile station over the HS-PDSCH. EX1005, 13:8-11, 13:50-62.

82. In Dateki’s preferred implementation of FIG. 6, transmission of the HS-SCCH (which carries the second transmission power control information TPCC2 to the mobile station) and HS-DPCCH (which carries the data signaled by the HS-SCCH to the mobile station) occurs with a time period that is *shorter* than the period between successive transmissions of the first transmission power control information on the F-DPCH. As Dateki explained:

... It is noted that in a preferred embodiment, the base station may recognize the transmission timing of the first transmission power control information TPCC1 addressed to plural mobile stations, and define and store *a time period T that is shorter than the transmission period of the first transmission power control information TPCC1* for the respective mobile stations *so that a HS-SCCH and/or a HS-PDSCH addressed to a mobile station may be transmitted to this mobile station before the time period T elapses from the transmission timing of the first transmission power control information TPCC1*. EX1005, 14:15-25 (emphasis added).

83. Thus, in Dateki’s preferred embodiment of FIG. 6, the timing of transmissions to a mobile station of the first transmission power control information

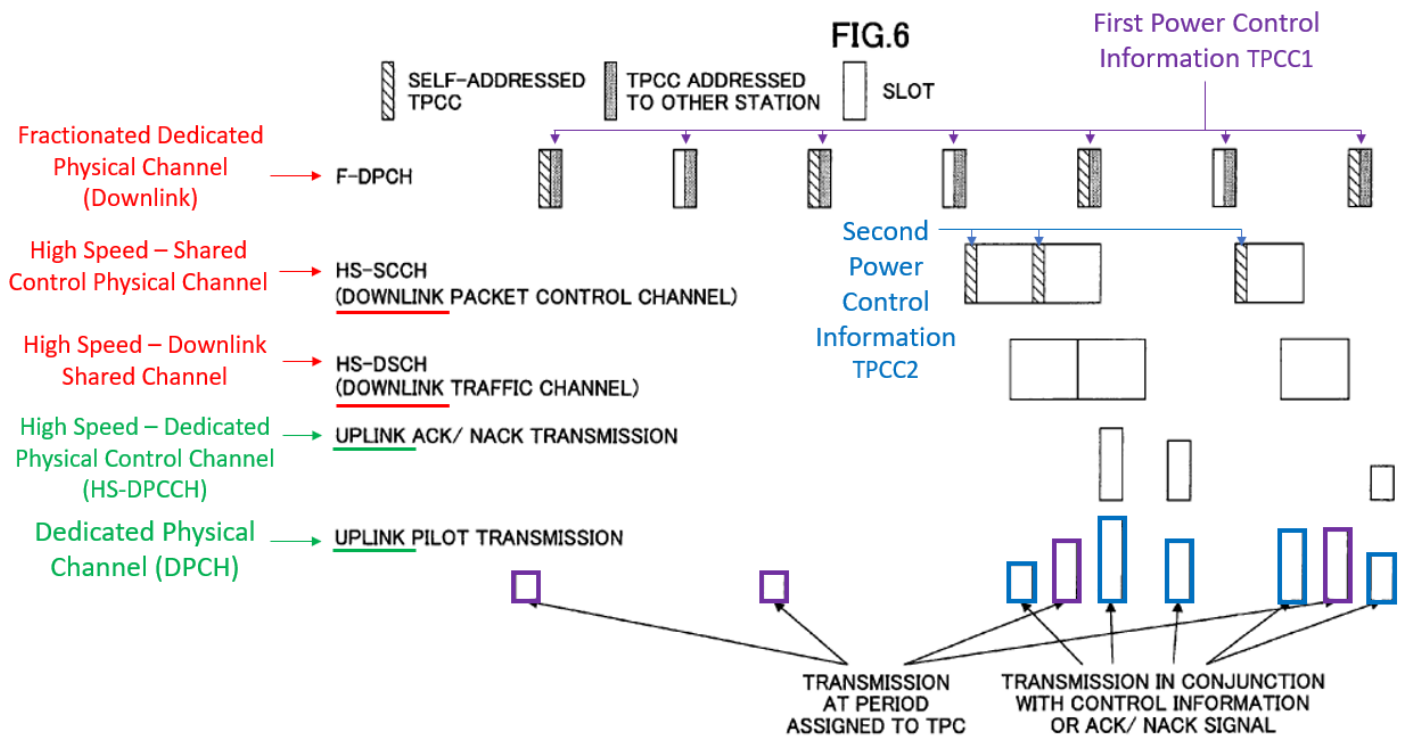
(TPCCI) on F-DPCH is such that information addressed to the mobile station on the HS-SCCH (which includes the second transmission power control information (TPCC2)) and the HS-PDSCH is sent in an interval (“T”) between successive transmissions of the first transmission power control information (TPCCI) on F-DPCH. Significantly, in a system where transmission to a UE of the HS-SCCH and HS-PDSCH is limited in time to the interval “T” between successive transmissions of the first transmission power control information (TPCCI) on the F-DPCH, there is no overlap in time between transmissions addressed to a UE on the HS-DPCCH and transmissions of first transmission power control information (TPCCI) to the UE on the F-DPCH. In other words, a message addressed to the UE that includes the first transmission power control information (TPCCI) on the F-DPCH will never share a timeslot with transmissions addressed to a UE on the HS-DPCCH.

84. Dateki makes clear that where data traffic (on the HS-PDSCH) is sent from the base station to the mobile station, the mobile station uses the second power control information (TPCC2) sent on the HS-SCCH to control the power of the ACK/NACK signal returned by the mobile station to the base station. EX1005, 13:8-23 (“in a case where data are transmitted via the HS-PDSCH, transmission power control may be conducted through transmission of an ACK/NACK signal before the transmission period of the first transmission power control information TPCC based on the transmission power control information TPCC that is previously transmitted”).

via the HS-SCCH"); 13:57-62; *see also*, 12:61-65 ("It is noted that the reception of the HS-PDSCH and *the transmission of the ACK/NACK signal are conducted in conjunction with the reception of the HS-SCCH*"); 6:29-39.

4. Transmission Of Pilot Signals Varies Depending On Transmission Of Data Traffic On The High Speed - Downlink Shared Channel (HS-DSCH)

85. In Figure 6 of Dateki (reproduced again below with annotations), there are two groups of pilot signals that are transmitted by the mobile station. Each pilot signal in the first group [purple boxes below] is transmitted in conjunction with the transmission period of the *first* transmission power control information" (also labeled in purple as TPCC1)." *Id.*, 12:37-39. Each pilot symbol in the first group [purple boxes] is transmitted just before the transmission of the next transmission of the *first* transmission power control information (TPCC1). *Id.*, 12:37-41 ("[t]he pilot signal is transmitted in conjunction with the transmission period of the first transmission power control information (self-addressed TPCC), and is transmitted before the transmission timing of the first transmission power control information").



86. In contrast to the first group of pilot signals, the second group of pilot signals [blue boxes above] are *triggered in different ways*. More specifically, the pilot signals in the second group [blue boxes above] are “transmitted *in conjunction with the transmission of* control information and *ACK/NACK signals* that are transmitted via the HS-SCCH. That is, *when a mobile station recognizes that data is being transmitted to itself via the HS-SCCH, or when it receives data addressed to itself via the HS-PDSCH*, it transmits a known signal (pilot signal) upon transmitting an ACK signal or a NACK signal.” EX1005, 12:53-60. Thus, when the mobile station recognizes (via the HS-SCCH) that data is being transmitted to the mobile station or when the mobile station is transmitting an ACK/NACK, the mobile station sends the pilot signals in the blue boxes above. Significantly, power control of the

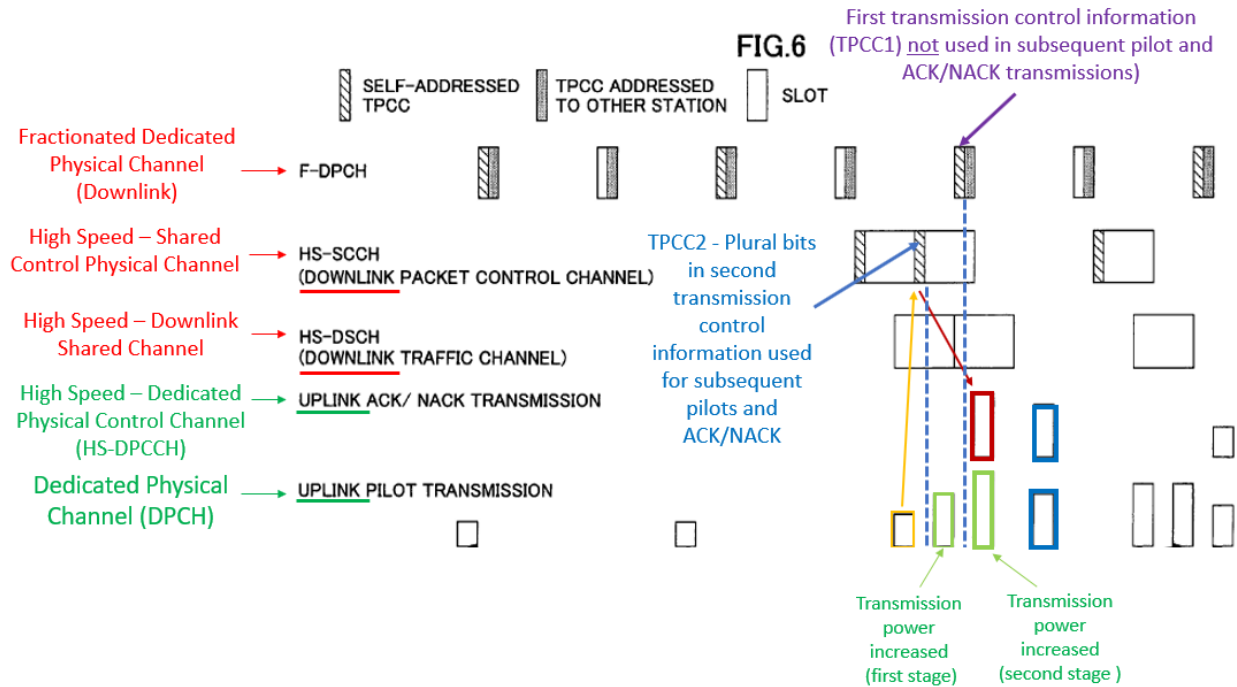
pilot signals transmitted in conjunction with an ACK/NACK is based on the second power control information (TPCC2) sent on the HS-SCCH (rather than the first power control information (TPCC1 sent on the F-DACH). EX1005, 12:48 (equating “known signal” with “pilot signal”) and 12:61-65 (“It is noted that the reception of the HS-PDSCH and the transmission of the ACK/NACK signal are conducted in conjunction with the reception of the HS-SCCH, and thereby, in either case, the known signal is transmitted in conjunction with the reception of the HS-SCCH”); 13:57-62 (“According to the present embodiment, in transmitting the ACK/NACK signal, for example, the second transmission power control information TPCC2 that is previously received via the HS-SCCH may be used to swiftly control the transmission power to a desired level”).

5. Figure 6 Of Dateki Illustrates Power Control Information (e.g., TPCC2) That Includes Plural Bits That Increase/Decrease Transmission Power In Plural Stages.

87. Dateki discloses that transmission power control information, e.g., the second power control information TPCC2, “may be arranged to use plural bits so that transmission power control may be conducted in plural stages (i.e., so that transmission power may be increased or decreased in plural stages).” EX1005, 11:15-18. Using “plural bits” from one power control message to increase/decrease transmission power in “plural stages” means, for example, that power control bits from one power control message (e.g., a TPCC2 message sent on the HS-SCCH) are

used by the mobile station to adjust the transmission power in stages over multiple subsequent transmissions.

88. Dateki discloses an example where one power control message is used to increase/decrease transmission power in “plural stages.” As shown in Figure 6 (reproduced again below with colored annotations), “[w]hen a base station receives the third (from the left) pilot signal [orange box], the base station may generate the second (from the left) TPC bit [labelled TPCC2] in the HS-SCCH based on the third pilot signal, and thereby, accurate transmission power control may be conducted upon transmitting the first ACK signal [reddish-brown box].” EX1005, 13:66-14:4 (emphasis added). The orange arrow extending from the third pilot from the left to TPCC2 illustrates that the value of that TPCC2 message is based on the third pilot signal from the left, while the reddish-brown arrow extending from the same TPCC2 message to the first ACK signal [reddish-brown box] illustrates that the second (from the left) TPC bit [labelled TPCC2] controls the transmission power of the first ACK signal [reddish-brown box]. *Id.*, 13:66-14:4.



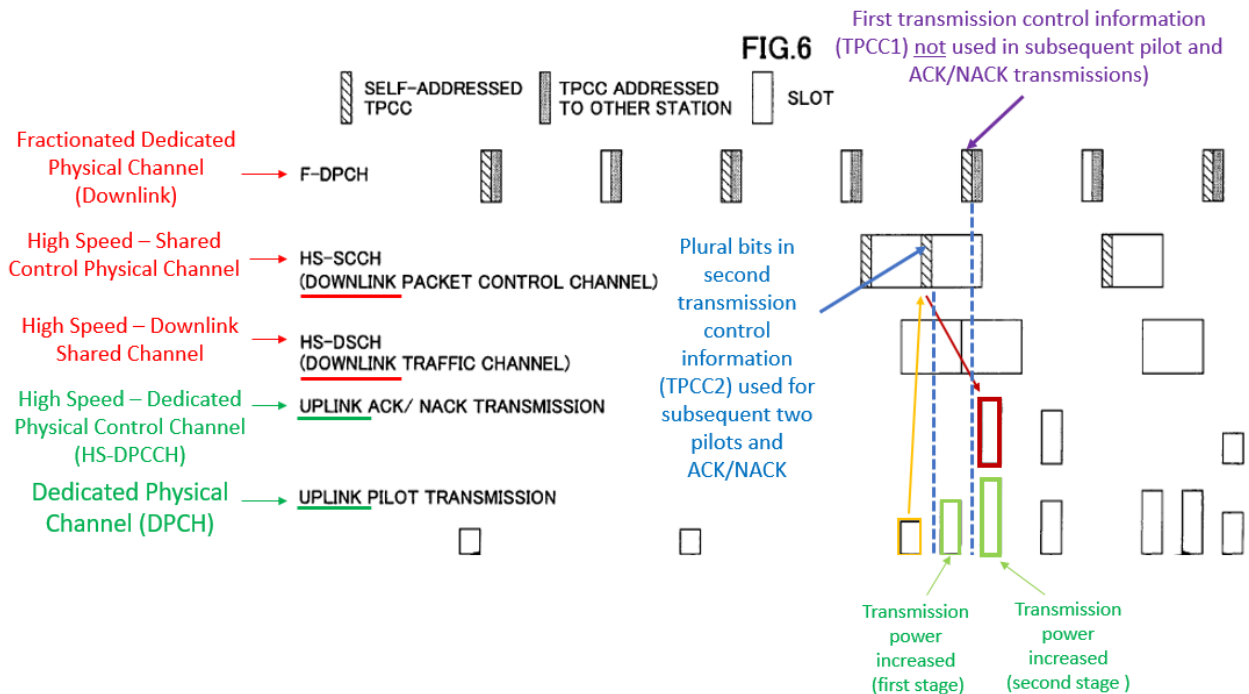
89. This aspect of Figure 6 illustrates the use of plural bits in one power control message [labelled **TPCC2** above] to increase transmission power in stages. Given that no intervening power control messages are provided between the mobile station receiving the power control message labelled TPCC2 and the mobile station increasing the transmission power of its pilot by a first amount (as shown in the **leftmost green box** above), it is clear that the information from the message labelled TPCC2 is used to increase the transmission power of the pilot signal in the leftmost green box (above) by a first amount or in a “first stage.” *Id.* Moreover, given (i) Dateki’s explicit statement (at 13:66-14:4) that the message labelled TCPP2 is used to control the transmission power of the first ACK [**reddish brown box** above], and (ii) and Dateki’s teaching (at 12:53-60) that the mobile station sends a pilot signal

when transmitting an ACK/NACK (as shown in the [rightmost green box](#) above), it is clear that the information from the message labelled TPCC2 is also used to increase transmission power of the pilot signal in the [rightmost green box](#) (above) again or in a “second stage.” As explained more fully in Section VI(A)(7), *infra*, the power of the second ACK/NACK signal as well as the pilot transmitted therewith ([blue boxes](#) above), are also controlled by the power control message [labelled [TPCC2](#) above] to decrease transmission power in a third stage.

6. Dateki Does Not Maintain Complete Correspondence Between The Transmission Power Control Message Immediately Preceding A Pilot Signal Or ACK/NACK And The Power Level At Which Such Pilot Signal Or ACK/NACK Is Transmitted

90. The fact that Dateki uses plural bits in one power control message to increase/decrease the transmission level in successive (plural) stages is significant because it means that Dateki does not maintain complete correspondence between the transmission power control message immediately preceding a pilot signal or ACK/NACK and the power level at which such pilot signal or ACK/NACK is transmitted. As explained in Section VIII(A)(5), *supra*, it is clear from Dateki’s disclosure that in Figure 6, the information from the message labelled TPCC2 is used to increase the transmission power of the pilot signal in the [leftmost green box](#) by a first amount or in a “first stage,” and the information from the same message labelled TPCC2 is also used to increase the transmission power of the pilot signal in the [rightmost green box](#) again or in a “second stage.”

91. Thus, as shown in the annotated version of Figure 6 below, even though the first transmission control information labelled in purple as TPCC1 (below) comes before both the transmission power of the first ACK [reddish-brown box below] and the pilot signal in the rightmost green box, Dateki makes clear that the power level of the first ACK [reddish-brown box below] and the pilot signal transmitted with the first ACK [rightmost green box below] is not controlled by the first transmission control information (labelled in purple as TPCC1) but rather by power control bits in the second transmission control information identified with blue arrow as TPCC2 below. *Id.*, 13:66-14:4 (disclosing that, based on “the second (from the left) TPC bit in the HS-SCCH [identified as TPCC2 below] ... accurate transmission power control may be conducted upon transmitting the first ACK signal [reddish-brown box below]”).



7. In Figure 6 Of Dateki, Power Control For ACK/NACK Signals And Pilot Signals Transmitted With ACK/NACK Signals Is Performed Using Second Power Control Information (TPCC2)

92. As explained in Section VIII(A)(3), *supra*, Dateki discloses that both the *timing* and *magnitudes* of the first power transmission control information (TPCC1) and the second transmission power control information (TPCC2) *differ*. More specifically, the first transmission power control information (TPCC1) for a UE on the F-DPCH is transmitted at a “*relatively longer*” time interval than that used for transmission of the second transmission power control information (TPCC2) to the UE on HS-SCCH when data is being transmitted to the UE on the HS-DSCH. EX1005, 13:4-11. In addition, the second transmission power control information (TPCC2) sent at a shorter interval on the HS-SCCH and used for power control when data is being transmitted to the UE is *greater in magnitude* than the first transmission

power control information (TPCC1) sent to the UE on the F-DPCH. EX1005, 13:54-57. As Dateki explains, the combination of (i) the shorter period cycle for transmission of the second transmission power control information (TPCC2), and (ii) the greater magnitude associated with the second transmission power control information (TPCC2), allows the second transmission power control information TPCC2 sent on the HS-SCCH “to swiftly control the transmission power to a desired level” when the base to station is sending data traffic to the mobile station over the HS-PDSCH. EX1005, 13:8-11, 13:50-62.

93. Dateki’s disclosure that the mobile station uses the greater power level associated with TPCC2 messages sent at shorter intervals during data transmission to the UE on the HS-DSCH to swiftly control the power of the ACK/NACK (and the pilot signals transmitted therewith) makes complete sense. When a mobile station receives data, it is important for the mobile station to be able to send an ACK/NACK signal to the base station with a power level that is high enough to ensure that the base station can accurately receive the ACK/NACK signals. In Figure 6 of Dateki, when data is not being sent to the mobile station on the HS-DSCH, the mobile station is not sending ACK/NACK messages and there is little need for the mobile station to send its pilot signal at a high power level because the consequence of the pilot signal not being received by the base station is small. However, when a mobile station transmits an ACK/NACK signal to the base station following the mobile

station's reception of data on the HD-DSCH, the consequence of the ACK/NACK not being heard is significant, i.e., the base station does not know whether the data it previously transmitted was properly received and, as a result, does not know whether it is necessary to retransmit such data to the mobile station. *Id.* Thus, in connection with sending ACK/NACK signals (and the pilot signals transmitted therewith), the mobile station in Figure 6 of Dateki uses the explicitly greater power level associated with the more frequent TPCC2 messages to ensure that the mobile station transmits the signals with sufficient power that the base station can accurately receive the ACK/NACK signals.

94. The annotated version of Figure 6 of Dateki below depicts in the **blue dotted box** the pilot and ACK/NACK signals sent by the UE based on the second power control information (TPCC2) transmitted to the UE on the HS-SCCH channel (labelled with **blue arrow**) in conjunction with the transmission of data traffic (labelled with **red arrow**) on the downlink traffic channel.

transmission power may be increased or decreased in plural stages)” (emphasis added). Moreover, as detailed below, it is clear from Dateki’s disclosure of Figure 6 that the power levels of (i) the pilot signal following the second from the left TPCC2 message labelled “first stage,” (ii) the first ACK/NACK and pilot labelled “second stage” and (iii) the second ACK/NACK and pilot labelled “third stage,” are all controlled by the second from the left TPCC2 message that is used to vary transmission power in three stages.

97. With respect to the pilot signal labelled “first stage,” given that no intervening power control messages are provided between the mobile station receiving the second from left TPCC2 information and the mobile station increasing the transmission power of its pilot by a first amount (labelled “first stage” above), it is clear that the information from the second from the left TPCC2 is what is used to increase the transmission power of the pilot signal labelled “first stage.”

98. With respect to the first ACK/NACK and pilot labelled “second stage,” the information in the second from the left TPCC2 is also used to increase transmission power of the first ACK/NACK and pilot transmitted therewith again in a “second stage.” Given (i) Dateki’s explicit statement (at 13:66-14:4) that information in the second from left TPCC2 is used to conduct “accurate transmission power control upon transmitting the first ACK,” and (ii) and Dateki’s teaching (at, e.g., 12:53-60) that the mobile station sends a pilot signal when transmitting an

ACK/NACK, it is clear that the information in the second from the left TPCC2 is what is also what is used to increase the transmission power of the first ACK/NACK and pilot transmitted therewith in a “second stage.”

99. With respect to the second ACK/NACK and pilot labelled “third stage,” the information in the second from the left TPCC2 is also used to decrease the transmission power of the first ACK/NACK and pilot transmitted therewith again in a “third stage.” Given (i) Dateki’s repeated statements that second power control information TPCC2 is used to control the transmission of ACK/NACK messages associated with data traffic sent on the downlink (EX1005, 3:8-11, 3:8-23, 13:57-62, 12:61-65 and 6:29-39), and (ii) and Dateki’s teaching (at, e.g., 12:53-60) that the mobile station sends a pilot signal when transmitting an ACK/NACK, it is clear that the information in the second from the left TPCC2 is what is used to decrease the transmission power of the second ACK/NACK and pilot transmitted therewith again in a “third stage.” Given that the purpose of Dateki’s use of the greater power level of the second power control information (TPCC2) for transmitting the ACK/NACK (and the pilot signals transmitted therewith), it would make no sense for the mobile station to begin using the less powerful first power control information (TPCC1) prior to the mobile station’s transmission of the second ACK/NACK signal to the base station. *Id.* More specifically, given the need for the mobile station to send ACK/NACK signals to the base station with a power level that is high enough to

ensure that the base station can accurately receive the ACK/NACK signals, it would not make sense for the mobile station to switch to the use of the lower first power control information (TPCC1) until after the final ACK/NACK associated with a given data transmission was sent. For this further reason, it is clear that the information in the second from the left TPCC2 (rather than TPCC1) is what is used to decrease the transmission power of the second ACK/NACK and pilot transmitted therewith again in a “third stage.”

B. Mate

100. Mate discloses “[a] method of downlink packet switching for use in a mobile telecommunications network having a plurality of base stations.” EX1009, Abstract. Figure 4 of Mate (reproduced below with colored annotations) illustrates the downlink and uplink channels involved in Mate’s system.

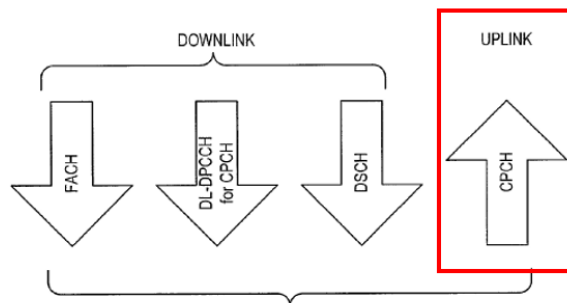


FIG. 4

101. As will be discussed later, Ground 2 of the Petition relies on Mate’s uplink Common Packet Channel (CPCH) [red box above], as disclosed in [0043] of Mate. See, Petition, at 53, *citing*, EX1009 (Mate) at [0043]. In Mate, “[t]he CPCH

is mapped to the Physical Common Packet Channel (pCPCH)” and can carry only “small amounts of uplink information” limited to control information. EX1009, [0005] and [0043]. As Mate explained:

... As it is known, a pCPCH has a data part that can carry small amounts of uplink information. This information can include short service request commands, download selection commands, transaction commands and all the acknowledgements, including RLC acknowledgements and network acknowledgements like TCP ACKs (transport control protocol acknowledgments). EX1009, [0043] (emphasis added).

102. Thus, Mate discloses that its pCPCH can be used to carry small amounts of control information on the uplink. Mate never suggests use of its pCPCH as a data traffic channel for carrying data traffic on the uplink.

C. Chitrapu

103. Chitrapu is directed to “WCDMA for the Unpaired Spectrum.” EX1008, 6.

IX. GROUND 1 FAILS TO CARRY ITS BURDEN

104. Ground 1 challenges independent claims 1 and 5 of the ‘889 Patent as obvious over Dateki alone. Petitioner therefore, bears the burden of showing that each element of independent claims 1 and 5 is met by Dateki either expressly or inherently, or is obvious based on Dateki alone. As discussed below, Petitioner has failed to carry its burden with respect to independent claims 1 and 5.

105. Claims 1 and 5 require a UE to transmit a signal based on power control information extracted from “the control message” having power control bits for a plurality of UEs, and “the control message” must also share a time slot with a downlink shared channel. The Petition maps “the control message” recited in the claims to first power control information (TPCC1) transmitted on the F-DPCH channel in Figure 6 of Dateki, and maps the “downlink shared channel” in the claims to the High Speed - Downlink Shared Channel (HS-DSCH) in Figure 6 of Dateki. This mapping fails because, to the extent that a control message with first transmission power control information (TPCC1) for a UE is sent on F-DPCH channel and the downlink data traffic channel (HS-DSCH) share a time slot, the first power control information (TPCC1) on the F-DPCH (mapped to “the control message”) is not used for the UE’s transmission power, as required by the Challenged Claims. Rather, the F-DPCH channel and the downlink data traffic channel (HS-DSCH) only share a time slot in cases where data is being transmitted to the UE on the downlink traffic channel, and in those cases, the second power control information (TPCC2) on the HS-SCCH -- as opposed to the first power control information (TPCC1) transmitted on the F-DPCH -- is used by the UE to

control the UE's transmission power.²

A. Ground 1 Fails To Carry Its Burden To Demonstrate That The UE Uses The First Power Control Information Sent On The F-DPCH In Figure 6 of Dateki For Power Control In The Case Where Downlink Data Traffic Is Being Sent To The UE

106. The Petition maps a transmission of first power control information (TPCCI) sent on the F-DPCH in Figure 6 of Dateki to “the control message” recited in independent claims 1 and 5 of the ‘889 Patent. Pet., 32 (“the TPC commands carried in the F-DPCH (control channel) comprise a *control message*”) (emphasis in original). The Petition maps the High Speed Downlink Shared Channel (HS-DSCH) in Figure 6 of Dateki to the “downlink shared channel” recited in independent claims 1 and 5 of the ‘889 Patent. Pet., 35 (stating that the HS-PDSCH “is an example of the *downlink shared channel* in limitation [1.2]”) (emphasis in original).

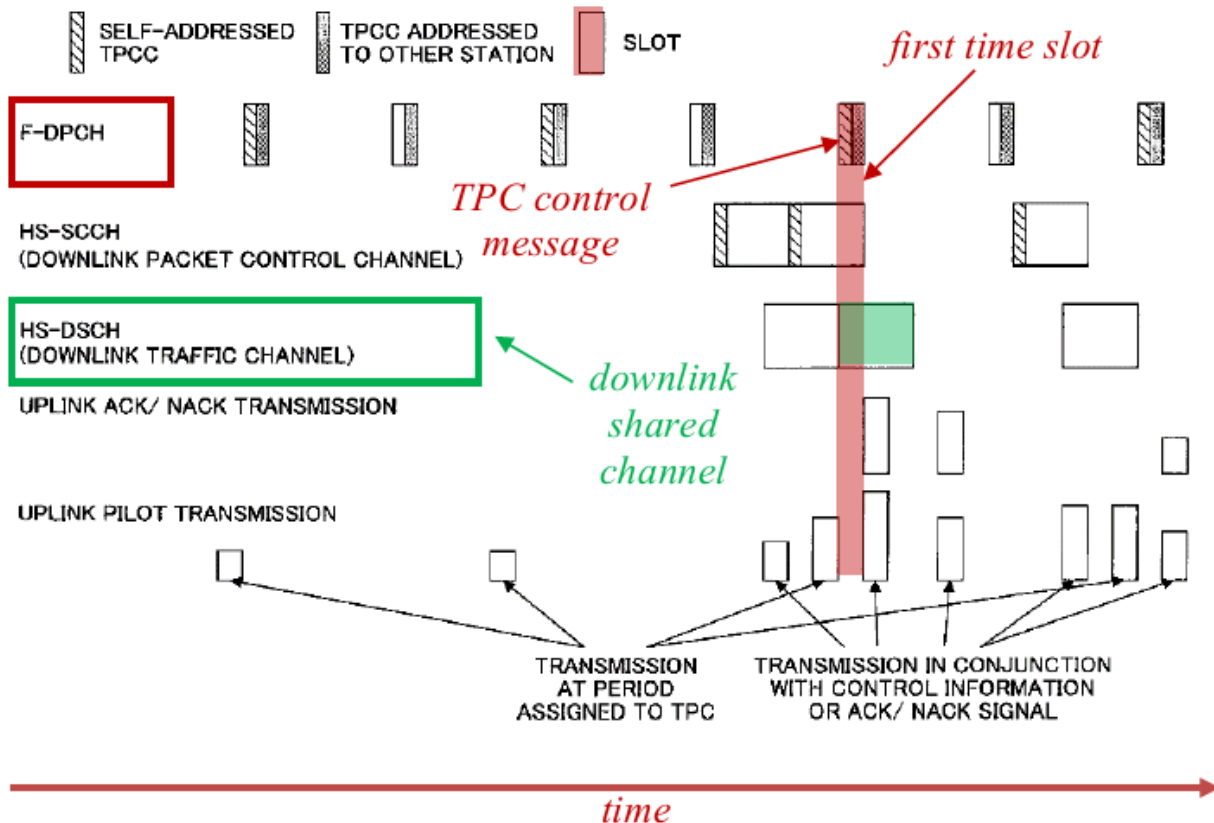
107. Dateki's preferred embodiment of FIG. 6 clearly fails to meet the claimed requirement that “the control message” (mapped to a message sent to the UE on the F-DPCH) share a timeslot with the “downlink shared channel” (mapped to the HS-DSCH). As explained in Section VIII(A)(3), in Dateki's preferred

² The Petition does not contend (nor could it) that the second power control information (TPCC2) on the HS-SCCH maps to “the control message” in the claims of the ‘889 Patent. As shown in Figure 6 of Dateki, each frame on the HS-SCCH has power control information for only a single UE. Thus, the power control information in each HS-SCCH frame cannot be “the control message” because it lacks power control bits for “a plurality of UEs.”

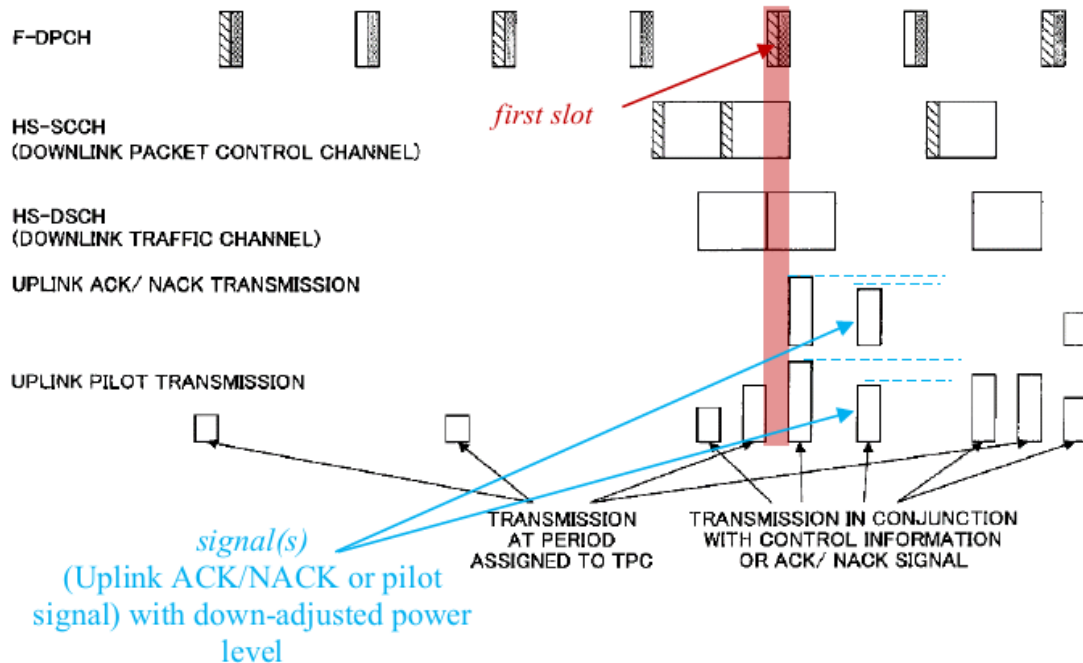
embodiment of FIG. 6, a message addressed to the UE on the F-DPCH that includes the first transmission power control information (TPCCI) will never share a timeslot with transmissions addressed to a UE on the HS-DSCH. In this regard, Dateki discloses that the timing of transmissions to a mobile station of the first transmission power control information (TPCCI) on F-DPCH is such that information addressed to the mobile station on the HS-SCCH (which includes the second transmission power control information (TPCC2)) and the HS-DSCH is sent in an interval (“T”) between successive transmissions of the first transmission power control information (TPCCI) on F-DPCH. EX1005, 14:15-25. Significantly, in this preferred embodiment where transmission to a UE of the HS-SCCH and HS-DSCH is limited in time to the interval “T” between successive transmissions of the first transmission power control information (TPCCI) on the F-DPCH, there is no overlap in time between transmissions addressed to a UE on the HS-DPCH and transmissions of first transmission power control information (TPCCI) to the UE on the F-DPCH. In other words, on the preferred embodiment, a message addressed to the UE that includes the first transmission power control information (TPCCI) on the F-DPCH will never even share a timeslot with transmissions addressed to a UE on the HS-DPCH.

108. Since the claims require that “the control message” share a time slot with “a downlink shared channel,” the Petition selected for its mapping a particular

transmission of first power control information (*TPCCI*) sent on the F-DPCH that just happens to overlap in time with the transmission of data traffic on the downlink over the HS-DSCH, as illustrated in the following figure from the Petition (at 36):



109. In connection with the above figure, the Petition asserts (without citation to Dateki) that “the second uplink ACK/NACK signal, or the pilot signal [transmitted therewith]” is transmitted based on first power control information received over the F-DPCH. Pet., 41-42. The Petition (at 41) illustrates this aspect of its mappings as follows:



110. With respect to its assertion that the second uplink ACK/NACK signal, or the pilot signal transmitted therewith [pointed to by the blue arrows above] is transmitted based on first power control information (TPCC1) received over the F-DPCH, the Petition (and Petitioner's expert) state only the following:

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. EX1003, ¶106. Pet., 41-42.

111. This assertion is not grounded in the teachings of Dateki and makes little sense. For example, while from the height of the second ACK/NACK signal (and its corresponding pilot signal) does change after the UE receives the identified TPCC1 information on the F-DPCH, the Petition fails to mention that the height of

the first ACK/NACK signal (and its corresponding pilot signal) also changed after the UE receives the identified TPCC1 information on the F-DPCH. *Id.* However, Dateki makes clear that even though the height of the first ACK/NACK signal (and its corresponding pilot signal) changes after the UE receives the specified TPCC1 information on the F-DPCH -- that height change is not based on the specified TPCC1 information sent on the F-DPCH but rather on second power control information transmitted over the HS-SCCH. See, Sections VIII(A)(5)-(7), *supra*; EX1005, 13:66-14:4 (“[w]hen a base station receives the third (from the left) pilot signal, the base station may generate the second (from the left) TPC bit in the HS-SCCH based on the third pilot signal, and thereby, accurate transmission power control may be conducted upon transmitting the first ACK signal”) (emphasis added).

112. The Petition fails to explain why the second ACK/NACK signal (and its corresponding pilot signal) following the specified TPCC1 information on the F-DPCH would be based on such TPCC1 information on the F-DPCH, when the first ACK/NACK signal (and its corresponding pilot signal) immediately following the specified TPCC1 information on the F-DPCH was not based on TPCC information from the F-DPCH.

113. The Petition provides no citation to Dateki in support of the assertion that the second ACK/NACK signal (and its corresponding pilot signal) is based on

the specified TPCC1 information on the F-DPCH because the disclosure of Dateki compels the opposite conclusion. Specifically, as explained in Section VIII(A)(7), *supra*, Dateki's disclosure that second power control information sent over the HS-SCCH is used to control the transmission of ACK/NACK messages associated with data traffic sent on the downlink (EX1005, 3:8-11, 3:8-23, 13:57-62, 12:61-65 and 6:29-39), and Dateki's teaching (at, e.g., 12:53-60) that the mobile station sends a pilot signal when transmitting an ACK/NACK, make clear that the height of the second ACK/NACK signal (and its corresponding pilot signal) are based on second power control information (TPCC2) sent over the HS-SCCH (not first power control information (TPCC1) sent on the F-DPCH as asserted in the Petition).

114. Simply put, the mapping in the Petition fails because the first power control information (TPCC1) sent on the F-DPCH (mapped to "the control message" recited in claims 1 and 5) is not used as the basis for the UE's transmission power for the second ACK/NACK signal (and its corresponding pilot signal) relied on in the Petition. Rather, to the extent that the F-DPCH channel and the downlink data traffic channel in Figure 6 of Dateki happen to share a time slot in cases where data is being transmitted to the UE on the downlink traffic channel, the second power control information (TPCC2) on the HS-SCCH -- not the first power control information (TPCC1) transmitted on the F-DPCH -- is used by the UE to control the transmission power of each ACK/NACK signal (and its corresponding pilot signal).

B. Ground 1 Fails To Carry Its Burden With Respect To Any Challenged Claims

115. As set forth above, Petitioner has failed to carry its burden in challenging independent claims 1 and 5. Since the obviousness arguments in Ground 1 directed to dependent claims 2 and 6 of the '889 Patent are predicated on the deficient arguments challenging independent claims 1 and 5 as discussed above, Ground 1 also fails to carry its burden with respect to dependent claims 2 and 6 of the '889 Patent.

X. GROUND 2 FAILS TO CARRY ITS BURDEN

116. For the reasons set forth above, Petitioner has failed to carry its burden in challenging independent claims 1 and 5. Since the obviousness arguments in Ground 2 directed to dependent claims 3 and 7 are predicated on the deficient arguments challenging independent claims 1 and 5, Ground 2 fails to carry its burden with respect to dependent claims 3 and 7.

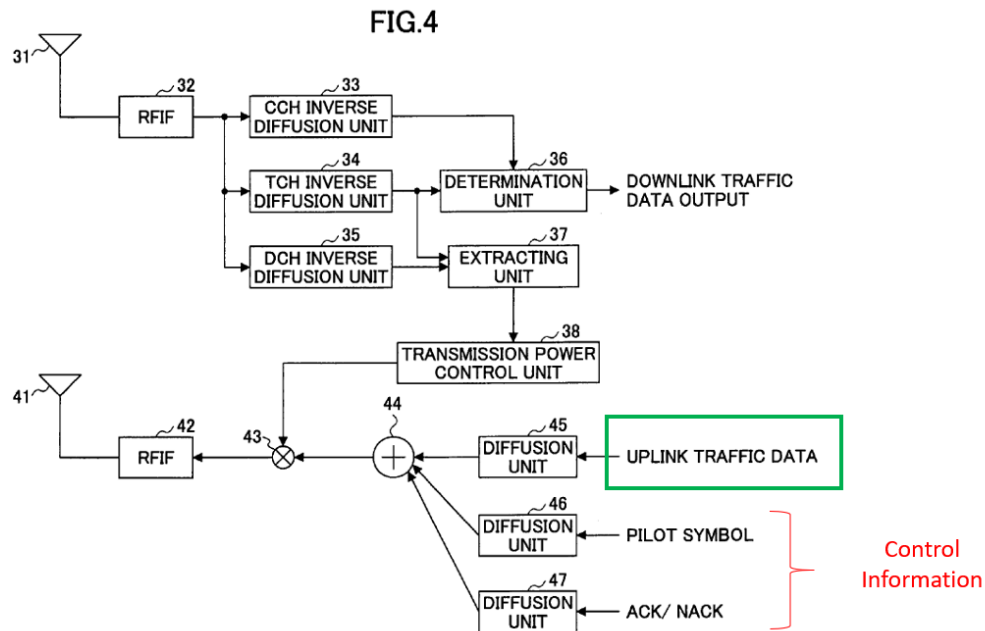
117. In addition, the additional reference (Mate) relied on in Ground 2 fails to teach or suggest the additional limitations of dependent claims 3 and 7. For example, dependent claim 3 recites:

3. 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 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.

118. According to the Petition, Dateki teaches uplink traffic data. Petition, 52, *citing* EX1005, 10:60-64. However, it is undisputed that Dateki fails to disclose transmission of such uplink traffic data “over a physical shared channel” as recited in dependent claims 3 and 7. In order to fill this gap, the Petition argues that a POSITA would have found it obvious for Dateki’s uplink data traffic “to be transmitted using Mate’s pCPCH channel (physical shared channel) because pCPCH is another part of the comprehensive 3-GPP-standardized UMTS protocols in which Dateki is based.” Petition, 53.

119. The Petition’s proposed use of Mate’s pCPCH channel to implement Dateki’s uplink data traffic would not have been appealing to a POSITA. In the 3-GPP-standardized UMTS protocols at the time of Dateki, the purpose of an uplink data traffic channel (as disclosed in Dateki) was to efficiently transport data traffic (referred to as “user data”) at data rates between 2-9 kbits/s. EX2016, 26 (specifying that a “traffic channel” is a logical channel which carries user information”) and 48 (identifying bit rates of traffic channels (TCH)). By contrast, Mate explains that its pCPCH is limited to carrying small amounts of control information on the uplink. EX1009, [0043]. A POSITA would have understood that Mate’s pCPCH, which was designed to carry small amounts of control information, was not suitable for implementing a data traffic channel for carrying data traffic (or user data) at the data rates (2-9 kbits/s) specified in the standard.

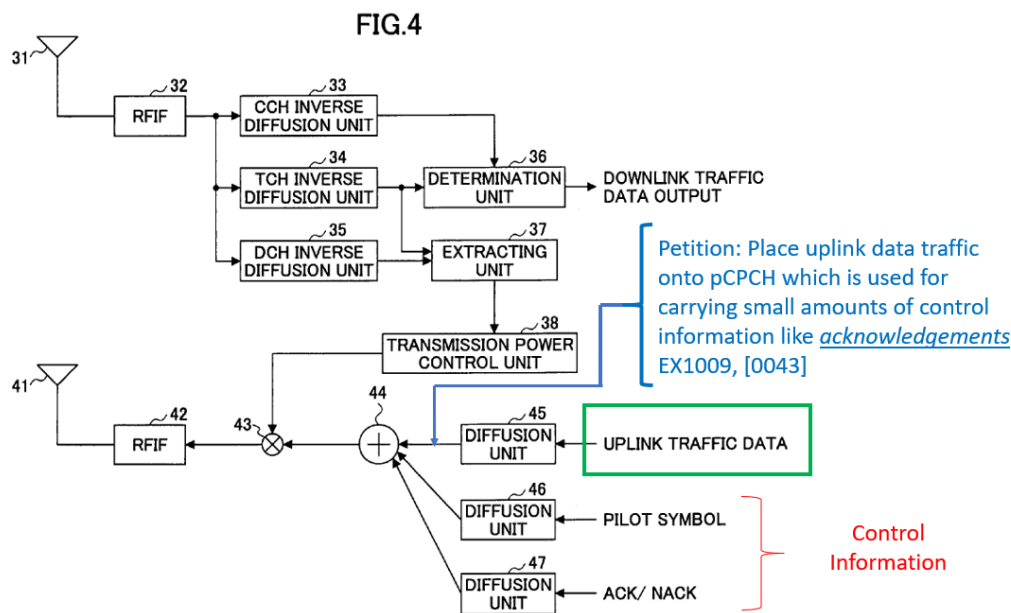
120. Turning first to Figure 4 of Dateki, which is reproduced below with colored annotations added by Patent Owner. Figure 4 of Dateki depicts a mobile station (or UE). EX1005, 10:10. The components of mobile station associated with uplink transmissions by the mobile station include diffusion units 45, 46 and 47, which provide diffused signals to multiplexing unit 43. *Id.*, 10:63-66. The output of multiplexing unit 43 is multiplied “by a control value from the transmission power control unit 38,” after which the signals are processed by RF frequency processing unit 42 and transmitted on antenna 41. *Id.*, 10:65-7:4.



121. As shown above, Dateki discloses three separate uplink channels (one for each of diffusion units 45, 46 and 47); diffusion unit 45 modulates “uplink data traffic” (green box) onto an uplink data traffic channel, and diffusion units 46 and 47 modulate control information comprising a pilot symbol and ACK/NACK onto

respective control channels, e.g., the HS-DPCCH used for transmission of the uplink ACK/NACK information and the DPCH for uplink pilot transmission as shown in Figure 6 of Dateki.

122. Set forth below is another annotated version of Figure 4 of Dateki illustrating (in blue) the Petition's proposal for transmitting Dateki's uplink data traffic using Mate's pCPCCH channel:



123. Based on Mate's disclosure, a POSITA would have understood that Mate's pCPCCH was limited to carrying small of amounts of control information such as acknowledgements and commands. EX1009, [0043]. Based that disclosure in Mate, a POSITA would have understood that Mate's pCPCCH was not suitable for implementing a data traffic channel for carrying data traffic (or user data) at the data rates (2-9 kbits/s) specified in the standard.

124. The Petitioner's purported motivation for using Mate's pCPCH to implement Dateki's data channel is limited to the allegation that Mate's "pCPCH is another part of the comprehensive 3GPP-standardized UMTS protocols in which Dateki is based." Petition, 53. The fact that both Mate's pCPCH and Dateki's uplink channel are both part of the vast 3GPP standard does not explain why a POSITA would have been motivated to use Mate's pCPCH (designed for carrying small amounts of control information) to implement a data traffic channel for carrying data traffic at the data rates (2-9 kbits/s) specified in the standard.

XI. GROUND 3 FAILS TO CARRY ITS BURDEN

125. For the reasons set forth above, Petitioner has failed to carry its burden in challenging independent claims 1 and 5. Since the obviousness arguments in Ground 3 directed to dependent claims 4 and 8 are predicated on the deficient arguments challenging independent claims 1 and 5, Ground 3 fails to carry its burden with respect to dependent claims 4 and 8.

126. In addition, the additional reference (Chitrapu) relied on in Ground 3 fails to teach the additional limitations of dependent claims 4 and 8. For example, dependent claim 4 recites:

4. 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.

127. As explained above, aspects of dependent claim 4 correspond to the disclosure in the '889 Patent of UEs in the CELL_ACTIVE state that automatically come out of the CELL_ACTIVE state when, for example, high downlink errors or low received signal strength indicates that the downlink is out-of-synchronization:

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). This feature prevents UEs continuing to transmit in a state where the feedback channel may be unreliable and thus causing interference. EX1001, 7:38-45 (emphasis added).

128. As explained in Section VII(B), *supra*, the language of dependent claims 4 and 8 requires that the first UE be configured to make a binary choice depending on whether or not the “time synchronized” condition is met. When there is time synchronization, the UE must “transmit the signal over the physical control channel; and when there is not time synchronization, the UE must “transmit a signal over a random access channel.” Among other requirements, this claim language requires that a connected UE that comes out of a “time synchronized” state (e.g., as evidenced by the presence of high downlink errors) transition from transmitting “the signal over the physical control channel” to transmitting “a signal over a random access channel.” The claim language is not be met by such a connected UE that continues transmitting “the signal over the physical control channel” when there is “not time synchronization.” As the Petition acknowledges, in the '889 Patent, the

“UE leaves [the] connected state in response to losing time synchronization.”
Petition, 69 (emphasis added).

129. In Ground 3, the Petition relies on Chitrapu’s use of a random access procedure when a UE leaves the idle state and transitions to a connected state. Petition, 71 (emphasis). Thus, rather than a UE leaving the “connected state in response to losing time synchronization” as taught in the ‘889 Patent, in the proposed combination a UE loses synchronization in response to leaving the connected state. The proposed combination is focused on the opposite of what is disclosed and claimed in the ‘889 Patent.

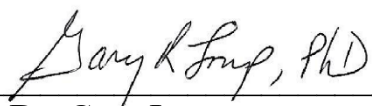
130. Lacking from Chitrapu (and Dateki) is any teaching of what happens when a UE in the connected state detects that it has lost synchronization (e.g., as evidenced by high downlink errors). EX1001, 7:38-45 (emphasis added). The language of dependent claim 4 requires that “the transmitter and the processor 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.” A mobile station in the connected state detecting a loss of synchronization (for example, as evidenced by high downlink errors) but nonetheless continuing to transmit “the signal over the physical control channel” despite the loss of synchronization, fails to meet the claim language, which requires that the mobile station “transmit a signal over a random access channel when not

time synchronized.” The Petition makes no effort to demonstrate that the combination of Chitrapu and Dateki teaches a mobile station in a connected state that, upon detection of a loss of synchronization based on, e.g., high downlink errors, transitions to “transmitting a signal over a random access channel,” as required by dependent claims 4 and 8. For this reason, the Petition has failed to carry its burden with respect to Ground 3.

XII. DECLARATION

131. I, Dr. Gary Lomp, declare that all statements made herein on my own knowledge are true and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Date: October 7, 2025

By: 
Dr. Gary Lomp